

**FLOOD DAMAGES ALONG THE MONONGAHELA AND
CHEAT RIVERS IN PENNSYLVANIA AND WEST
VIRGINIA AS THE RESULT OF SEVERE FLOODING
IN NOVEMBER 1985**

(99-41)

HEARING
BEFORE THE
SUBCOMMITTEE ON WATER RESOURCES
OF THE
COMMITTEE ON PUBLIC WORKS AND
TRANSPORTATION
HOUSE OF REPRESENTATIVES
NINETY-NINTH CONGRESS
SECOND SESSION

—————
FEBRUARY 7, 1986, AT POINT MARION, PA
—————

Printed for the use of the
Committee on Public Works and Transportation



U.S. GOVERNMENT PRINTING OFFICE

59-606 O

WASHINGTON : 1986

COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION

JAMES J. HOWARD, *New Jersey, Chairman*

GLENN M. ANDERSON, California	GENE SNYDER, Kentucky
ROBERT A. ROE, <i>New Jersey</i>	JOHN PAUL HAMMERSCHMIDT, Arkansas
JOHN B. BREAUX, Louisiana	BUD SHUSTER, Pennsylvania
NORMAN Y. MINETA, California	ARLAN STANGELAND, Minnesota
JAMES L. OBERSTAR, Minnesota	NEWT GINGRICH, Georgia
HENRY J. NOWAK, New York	WILLIAM F. CLINGER, Jr., Pennsylvania
ROBERT W. EDGAR, Pennsylvania	GUY MOLINARI, New York
ROBERT A. YOUNG, Missouri	E. CLAY SHAW, Jr., Florida
NICK JOE RAHALL II, West Virginia	BOB McEWEN, Ohio
DOUGLAS APPEGATE, Ohio	THOMAS E. PETRI, Wisconsin
RON DE LUGO, Virgin Islands	DON SUNDQUIST, Tennessee
GUS SAVAGE, Illinois	NANCY L. JOHNSON, Connecticut
FOFO I.F. SUNIA, American Samoa	RON PACKARD, California
DOUGLAS H. BOSCO, California	SHERWOOD BOEHLERT, New York
JIM MOODY, Wisconsin	TOM DeLAY, Texas
ROBERT A. BORSKI, Pennsylvania	SONNY CALLAHAN, Alabama
JOE KOLTER, Pennsylvania	DEAN A. GALLO, New Jersey
TIM VALENTINE, North Carolina	HELEN DELICH BENTLEY, Maryland
EDOLPHUS TOWNS, New York	JIM LIGHTFOOT, Iowa
WILLIAM O. LIPINSKI, Illinois	DAVID S. MONSON, Utah
MICHAEL A. ANDREWS, Texas	JOHN G. ROWLAND, Connecticut
J. ROY ROWLAND, Georgia	
ROBERT E. WISE, Jr., West Virginia	
KENNETH J. GRAY, Illinois	
CHESTER G. ATKINS, Massachusetts	
PETER J. VISCLOSKY, Indiana	
JAMES A. TRAFICANT, Jr., Ohio	
CATHY (MRS. GILLIS) LONG, Louisiana	
JIM CHAPMAN, Texas	
CARL C. PERKINS, Kentucky	

SUBCOMMITTEE ON WATER RESOURCES

ROBERT A. ROE, *New Jersey, Chairman*

JOHN B. BREAUX, Louisiana	ARLAN STANGELAND, Minnesota
DOUGLAS H. BOSCO, California	JOHN PAUL HAMMERSCHMIDT, Arkansas
EDOLPHUS TOWNS, New York	WILLIAM F. CLINGER, Jr., Pennsylvania
ROBERT E. WISE, Jr., West Virginia	GUY MOLINARI, New York
PETER J. VISCLOSKY, Indiana	BOB McEWEN, Ohio
GLENN M. ANDERSON, California	THOMAS E. PETRI, Wisconsin
NORMAN Y. MINETA, California	DON SUNDQUIST, Tennessee
JAMES L. OBERSTAR, Minnesota	NANCY L. JOHNSON, Connecticut
HENRY J. NOWAK, New York	RON PACKARD, California
ROBERT W. EDGAR, Pennsylvania	TOM DeLAY, Texas
ROBERT A. YOUNG, Missouri	SONNY CALLAHAN, Alabama
NICK JOE RAHALL II, West Virginia	DEAN A. GALLO, New Jersey
FOFO I.F. SUNIA, American Samoa	HELEN DELICH BENTLEY, Maryland
JIM MOODY, Wisconsin	GENE SNYDER, Kentucky
ROBERT A. BORSKI, Pennsylvania	(<i>Ex Officio</i>)
JOE KOLTER, Pennsylvania	
RON DE LUGO, Virgin Islands	
J. ROY ROWLAND, Georgia	
CHESTER G. ATKINS, Massachusetts	
CATHY (MRS. GILLIS) LONG, Louisiana	
JAMES J. HOWARD, <i>New Jersey</i>	
(<i>Ex Officio</i>)	

CONTENTS

TESTIMONY

	Page
Angelo, Aldo T., supervisory hydrologist, National Weather Service, Pittsburgh, PA	57
Ashcraft, George W., Ashcraft Construction Co., Monongahela, PA	174
Broadwater, Ted, East Millsboro, PA	183
Burns, J. Bracken, director, Emergency Management Service, Washington County, PA	160
Corso, Ronald A., Director, Division of Inspections, Office of Hydropower Licensing, Federal Energy Regulatory Commission, accompanied by Don Garber, Deputy Director, Office of Hydropower Licensing; and Pamela W. Simpson, House liaison	57
Lebder, Fred, chairman, Fayette County Commissioners, accompanied by Bernie Atz, Luzerne Township Supervisor; and Bob Jones, commissioner	160
Marcinek, Dr. Margaret A., Springhill Township, PA	183
Millington, Andrew L., Dillner Storage Co., West Elizabeth/Pittsburgh, PA	174
Murphy, Hon. Austin J., a Representative in Congress from the State of Pennsylvania	2
Niverth, Martin, director, Green County Conservation District, Waynesburg, PA	160
Offringa, Brig. Gen. Peter J., Commander, Ohio River Division, U.S. Army Corps of Engineers, accompanied by Col. Richard A. Rothblum, Commander, Pittsburgh District; Ed Kovanic, Chief of Engineering, Pittsburgh District; Dick Armstrong, Chief Engineer, Ohio River Division; and George Cingle, Pittsburgh District	8
Whipp, Donald, manager, Public Information, West Penn Power Co., accompanied by Boris Petroff, station superintendent, Lake Lynn Power Station ..	92

SUBMISSIONS FOR THE RECORD

Ashcraft, George W., Ashcraft Construction Co., Monongahela, PA, statement	181
Atz, Bernie, Luzerne Township Supervisor, statement	166
Broadwater, Ted, East Millsboro, PA, statement	194
Burns, J. Bracken, director, Emergency Management Agency, county of Washington, Commonwealth of Pennsylvania, statement	171
Corso, Ronald A., Director, Division of Inspections, Office of Hydropower Licensing, Federal Energy Regulatory Commission:	
Statement	86
Lake Lynn Dam, Federal Energy Regulatory Commission warning and evacuation plan, notification given under plan, November 4 through 10, 1985	63
Greene County Board of Commissioners, statement	169
Millington, Andrew L., Dillner Storage Co., West Elizabeth/Pittsburgh, PA, statement	176
Offringa, Brig. Gen. Peter J., Commander, Ohio River Division, U.S. Army Corps of Engineers:	
Letter from Lt. Col. S.W. Pinnell, Assistant Director of Civil Works for Central Divisions, Corps of Engineers, to Hon. Joseph C. Swidler, Chairman, Federal Power Commission, dated January 29, 1965	30
Letter supplementing testimony	32
Rothblum, Richard A., Colonel, Corps of Engineers, District Engineer, and Robert A. Nycoff, Executive Director, Operating Allegheny Power System for West Penn Power Co., letter to Senator Arlen Specter, Pennsylvania, dated January 28, 1986	54

Whipp, Donald, manager, Public Information, West Penn Power Co.:	
Cheat River Basin Flood of November 4-5, 1985 Post-flood Inspection	
Report, Lake Lynn Dam, FERC Project No. 2459, West Virginia,	
Project 84-197-40, December 1985, prepared by GAI Consultants Inc.,	
for West Penn Power Co.	112
Photos	103
Statement.....	97

ADDITIONS TO THE RECORD

Staggers, Hon. Harley O., Jr., a Representative in Congress from the State of	
West Virginia, statement	199
Sunny, Bob, Brownsville, PA, statement with attachments.....	202
Swift, James V., vice president, the Waterways Journal Weekly, letter.....	208
West Virginia Highlands Conservancy and the Environment Policy Institute,	
statement re proposed Rowlesburg Dam, WV.....	209
Yoder, Richard B., Morgantown, WV, letter	214

FLOOD DAMAGES ALONG THE MONONGAHELA AND CHEAT RIVERS IN PENNSYLVANIA AND WEST VIRGINIA AS THE RESULT OF SEVERE FLOODING IN NOVEMBER 1985

FRIDAY, FEBRUARY 7, 1986

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON WATER RESOURCES,
COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION,
Point Marion, PA.

The subcommittee met, pursuant to call, at 10 a.m., in the fire hall, Point Marion, PA, Hon. Robert A. Roe (chairman of the subcommittee) presiding.

Members present: Representatives Roe, Clinger, Wise, and Murphy.

Mr. ROE. Good morning, ladies and gentlemen.

At the outset, let me thank Mayor Rudolph and all the folks that came out to meet us and get us in here. The reason we were late was because there is a very heavy storm, ice storm in Washington, and they had to defrost our wings before we could take off in our plane. So that is the reason that we are a little bit late and we apologize for that. I do want to thank the mayor for his courtesy again, and for the folks that came to visit with us and got us out here. I want to introduce you all to the Members of Congress that have joined with us this morning.

My name is Congressman Roe—r-o-e. I am from New Jersey. I am chairman of the Subcommittee on Water Resources.

To my left we have our ranking Republican member, William Clinger, who is from Pennsylvania.

To my right, we have Congressman Bob Wise, who is from West Virginia.

Harry Staggers of West Virginia would have been with us but he was so late in trying to get everybody coordinated, he missed us by 5 minutes, and I know that Bob Wise will speak to his visitation.

Congressman Edgar is also due here.

Then we have, of course, our host Austin Murphy, who is your Congressman, and will be participating in this hearing.

We have a number of witnesses. I am standing up because I like to look at people when I talk with them, and not stand behind some kind of screen that has to be there so we can show you some slides. That will be removed. So, we are going to move along rather fast. Please don't consider that to be rude. We don't want to shut anybody's point off, but we have to leave at 2 o'clock to get us back

to Washington. Members have to go on from there back to their own respective districts. My State though is buried in snow. Hopefully I will try to get home.

This morning the House Public Works and Transportation Subcommittee on Water Resources convenes to receive testimony on flood damages which occurred along the Monongahela and Cheat Rivers in Pennsylvania and West Virginia as the result of severe flooding which began on November 5, 1985.

This hearing will focus on the possible causes of the flooding and the relationship between and responsibilities of different Federal agencies and the private power company in the management and operation of the water resources projects in the area.

Extremely heavy rains of over 14 inches fell during the period of November 1 to 5, 1985. A great portion of this rainfall fell into the Cheat River basin. Questions have been raised concerning the operation of Lake Lynn Dam by the West Penn Power Co. and the role of the Corps of Engineers in regulating both the privately owned dam as well as the water resources projects under the corps' jurisdiction.

We will receive testimony from the Corps of Engineers concerning water resource structures under their control and from the West Penn Power Co. concerning their operation of the Lake Lynn Dam during the period of flooding. We hope to learn what, if any, steps could have been taken to mitigate the severe damages which occurred.

We will also be receiving testimony from the Weather Service concerning meteorological conditions, and from State and local officials as well as private citizens.

This hearing will aid the subcommittee in fulfilling its responsibility to develop a truly effective water resources policy which harnesses the enormous potential of water to do good and simultaneously protects people and property from damage and destruction.

Having said that, to open the hearing I now defer to your very distinguished representative and a personal friend of mine from Pennsylvania, the Honorable Austin J. Murphy, who literally worked a miracle to be able to get us to be here today, again because of the weather conditions, and everything else.

And to be honest with you, about 7 o'clock this morning, when we were talking back and forth as to whether this flight would take place to get here, there was some of us that waived a little bit. But then we put a call through to your State to see what the situation was, and we heard that the weather was better and we also got the word from Congressman Murphy. He said you had better show up or the people of that section of Pennsylvania and West Virginia will kill you. That is why we are here.

I defer to your distinguished Representative, the Honorable Austin J. Murphy.

**TESTIMONY OF HON. AUSTIN J. MURPHY, A REPRESENTATIVE IN
CONGRESS OF THE STATE OF PENNSYLVANIA**

Mr. MURPHY. Thank you very much, Chairman Roe.

It is a pleasure to welcome you, the members of the House Subcommittee on Water Resources, and our colleagues, to the 22d Congressional District of Pennsylvania.

We in southwestern Pennsylvania, as well as many people in West Virginia, have suffered a great deal because of the devastating flood in the Cheat and Monongahela River Valleys on November 5.

Immediately after the flood, I visited every affected community in my district to inspect the devastation and to talk with my constituents who had suffered serious property damage. After these firsthand observations and discussions, I concluded that this investigation by your subcommittee was absolutely necessary.

Mr. Chairman, I am pleased that you acted favorably upon my request.

The November 1985 flood on the Monongahela River resulted in extensive damage to homes, businesses, municipal operations, and river navigation facilities. Approximately 2,784 homes were damaged, 230 commercial and industrial establishments suffered an estimated \$11 million in losses—\$3 million of this damage was incurred by the Wheeling-Pittsburgh Steel plants; 62 barges broke loose from their moorings, hit other barges and became caught in locks and dams. The interruption of river transportation resulted in a \$500,000 daily economic loss in the Monongahela Valley. This burden lasted for at least 30 days, a \$5 million economic loss to this area, already suffering severe economic losses.

There are nine locks and dams on the Monongahela River and one hydropower dam on the Cheat River. Unfortunately, none of these dams were designed or constructed to provide flood protection to the downstream inhabitants. There have been numerous floods on the rivers in this area, dating back to 1832. It seems that little thought has been given to flood control during the design and construction of these navigation dams as well as the hydropower dam.

For many years, there has been authorization for the construction of a flood control dam on the Cheat River known as the Rowlesburg Dam. In a January 16, 1986, letter from the Pittsburgh District Corps of Engineers, the corps indicted that "The Rowlesburg project was placed in the inactive category by the Chief of Engineers on January 9, 1978. This classification resulted primarily from the request of the State of West Virginia that all planning on the Rowlesburg project be terminated, and that it be placed in an inactive status."

In another letter from the Office of the Chief of Engineers dated January 17, 1986, the corps stated although there are two completed flood control structures in the Monongahela River headwaters, the Tygart and Youghiogheny Dams, they only control approximately 22 percent of the runoff from the Monongahela River watershed. This means that 78 percent is not controlled. We need to press on with controlling as large a portion as possible of this remaining 78 percent of the runoff.

A good place to start would be to expedite the completion of the Stonewall Jackson Dam on the west fork of the Monongahela River and to reactivate the Rowlesburg Dam project. As this panel is well aware, there is a bill presently before the U.S. Congress, H.R. 6,

which provides for the conservation and development of water and related resources and the improvement and rehabilitation of the Nation's water resources infrastructure.

I want to thank you for including locks 7 and 8 in that bill.

Title X of that bill provides for project deauthorization and on page 313 of the bill there are three short lines that deauthorize the Rowlesburg project.

At this time, I would like to quote from the December 7, 1985, Interagency Flood Hazard Mitigation Report, prepared by region III of West Virginia:

The structural project in the Monongahela River basin with the greatest potential for controlling the 1985 flood would be the Rowlesburg Lake project on the Cheat River. The project would have prevented all damages at Rowlesburg and Albright due to Cheat River flooding and also would have prevented an estimated \$77 million damages in West Virginia and Pennsylvania. As proposed, the project would have about 300,000 acre-feet of flood control storage. The project is presently authorized for development, but due to restrictions on the length of time an undeveloped project can remain authorized, the project is now eligible to be deauthorized.

I have discussed this proposed deauthorization with my good friends and colleagues in Congress from West Virginia, whose constituents have also suffered from the devastating floods. I realize that there are a number of important and sometimes conflicting public concerns that they must weigh to decide what is best for their districts. However, I believe that the Rowlesburg Dam project needs to be reactivated, funded, and under construction as soon as possible.

The Chief of Engineers advised me on January 17, 1986, that the partially completed Stonewall Jackson Dam may well have prevented an estimated \$18 million in additional damage throughout the Monongahela River Valley. I understand that had the Rowlesburg Dam been in place, the corps believes it would have prevented most of the estimated \$77 million in flood damages along the Cheat and Monongahela Rivers between the project side and Pittsburgh.

The estimated reductions in river levels along the Monongahela River if we had had the Rowlesburg Dam in place, would have been 10.5 feet at Point Marion and Greensboro, 8.5 feet at Elizabeth, 7 feet at Braddock and 5 feet from there to Pittsburgh. So, it is quite obvious to me that the Rowlesburg project is absolutely needed to avoid another such catastrophe.

Mr. Chairman, you are about to hear testimony from the various Federal agencies, State and local officials, as well as private citizens as to their individual involvement in the events leading up to and during the November 5 flood. While I understand the navigation locks and dams as well as the one hydropower dam are not designed for flood control, they nevertheless hold back millions of gallons of water unnaturally and it should still be their obligation to adequately warn the communities along the Cheat and Monongahela Rivers.

The National Weather Service issued flood watches on Sunday, November 3 and again on Monday morning, November 4. By late Monday morning the Weather Service was reporting alarming water levels upstream on the Cheat as they became available. Personnel on the Lake Lynn Dam have said that they were in constant communication with the Corps of Engineers as early as Sunday.

What did they communicate and when? Is it possible if there had been more coordination between the locks and dams on the Monongahela River and the Lake Lynn Dam on the Cheat River that the crest of the flood could have been significantly reduced? We hope to have answers to these and more questions as we listen to the testimony today.

After inspecting the area of some preliminary investigation and a good deal of research into the statutory and regulatory obligations of dam operators, I have some fundamental questions as to how this flood was handled. I hope these questions are addressed today:

One, Why couldn't the navigation pool on the Monongahela River for a distance of over 70 miles been dropped as low as the open locks would allow in anticipation of the flood crest?

Two, Similarly, and in coordination with the corps locks and dams on the Monongahela River, why couldn't Lake Lynn been preemptively drained? I know this would have interrupted power generation, but surely the cost of purchasing substitute power on the grid would be a small price to pay if it would have prevented some of the flood damage.

If these precautionary measures had been instituted, the lower river level of the Monongahela River and the empty reservoir behind Lake Lynn could have absorbed a good deal of the onslaught of water. Instead, the navigation pool was maintained and the reservoir was full or near full when the flood hit. We have all seen the result.

If the corps' role on the Monongahela River is restricted to aiding commercial navigation, then the Congress will have to expand their duties, and if necessary, their facilities, to include protecting the people in the valley from floods.

If the hydropower company is only in business to generate power for profit, we must make it a condition of doing business that they accept a larger role in flood protection. This is nothing new or revolutionary. Even the old English common law which we often still follow in this country held anyone who artificially impounded water—in this case millions of gallons—be liable for the damage caused if the water is unleashed to flood surrounding land. This common law, or one might say commonsense approach still makes a lot of sense.

Before I conclude, although this is not within the scope of this subcommittee's hearing today, I would like to mention that many people here today, as well as many thousands of others, have suffered tremendous damage and are still trying to obtain assistance that will enable them to return to their previous living conditions. There has been far too much delay and bureaucratic redtape from the executive branch of the Government, which has interfered with the expeditious handling of disaster relief. The flood happened November 5, the Federal disaster centers opened November 13, and today people are still waiting to receive financial assistance, not to mention those individuals who still do not have a home to live in.

The aftermath that these people have endured is beyond imagination and I would be remiss if I did not point that out to my colleagues. May you and your constituents never share an experience like this one.

I want to thank the president of the Point Marion Fire Hall, Mr. Dave Wydick and his members, as well as the mayor, Mr. Bud Rudolph, for offering us their hospitality. As you can see, this facility, too, was ravaged by the flood and is still under construction. If you look to my right, you can still see the water lines on the windows, testifying to the height of the floodwaters.

Mr. Chairman, I urge you and your subcommittee, as you listen to the testimony today, to give all possible support to the construction of storage dams on the tributaries to the Monongahela River so that my constituents in Pennsylvania do not suffer any further devastating floods.

Thank you very much for allowing me this time for the opening.

Mr. ROE. I thank the gentleman for his testimony.

I am going to call upon the Members of Congress to make their observations before we call on General Offringa of the Corps of Engineers and also Col. Richard Rothblum, who is from the Pittsburgh district. So, my first request would be for opening statements from the Honorable William F. Clinger, Congressman from the State of Pennsylvania, and who also is the ranking minority member of this subcommittee.

Mr. CLINGER. Thank you very much, Mr. Chairman.

I am pleased to join you here in the southwest corner of the great Keystone State to take a look at the problems caused by flooding which occurred here in the fall of last year. I want to commend you for holding these hearings and bringing the subcommittee to Point Marion to receive the testimony of not only officials involved, but also the local citizens and business people. I also want to commend our good colleague, Austin Murphy, for urging us and importuning us to come here. He has been an outstanding representative of this district and has brought the attention of the committee to what was obviously a devastating event here last November.

As you said, Mr. Chairman, I am from Pennsylvania. My home is in Warren, PA, which lies along the Allegheny River, so I am very sympathetic to the kind of catastrophe that you all experienced here, because for many years in my hometown, we had almost annual flooding of the community. In fact I can recall having to leave my own home by boat on numerous occasions because of the flooding of the Allegheny. Fortunately, we now have installed the Kinzu Dam about 7 miles upstream from Warren, and we now have some assurance that we will not have those floods again. So, I come here today very sympathetic to the problems that you had last year.

While our ability to do something about an imminent flood may be limited, we do have an ability, I hope, to prepare effectively for the eventualities of a flood through long-term planning and the implementation of effective flood control measures. This is not something, as we know, that can be done overnight or in a period of weeks or months, rather it requires a lot of people working very hard over a long period of time to undertake the necessary analyses and planning of what needs to be done to prevent a major flood from occurring, or at least to lessen the damage that may be caused.

I think that is the thrust of our hearing this morning, to see what we can do to reduce the risk of a similar disaster in the future. So, I am pleased, very pleased, Mr. Chairman, that we are holding the hearing to explore the cause of the flooding and to examine what could be done in the future to prevent this kind of catastrophe from happening again.

So, I thank you again, Mr. Chairman, for bringing the subcommittee here. I look forward to the testimony with the hope and very realistic expectation that what we hear today will help this community and this subcommittee in identifying the steps that may be appropriate to try to prevent a recurrence of last fall's devastation.

Thank you, Mr. Chairman.

MR. ROE. Now, for an opening statement from Hon. Robert Wise, a very distinguished member of this committee from West Virginia.

MR. WISE. Thank you, Mr. Chairman, and I want to thank Austin for the privilege of being here.

Also, Congressman Staggers would have been here, but he got caught in the bad weather we ran into in Washington. The roads were almost impassable.

I do want to say for Congressman Murphy that when we were sitting on the ground in the airport that they were not permitting any planes to land, and they had deiced the wings twice and started and turned the engines off twice, I started to have some doubts, but Bob Roe said, Austin Murphy asked us here, we are going. So, we appreciate the chance to be here with you.

Also, as I say, Congressman Staggers was not able to be here. He and I talked last night—he has a staff person here—because both of us, as you have, have faced the same tragedy that came in November, and in fact, Austin, as I look and walk around this fire hall, I am reminded of the fire hall in Weston, where I rode out the flood, as a matter of fact, and the men and women of that volunteer fire department were the only source of emergency coordination during that flood. It was completely surrounded by water, suffered the same damages, just the same as this one did. I suspect this one served the same function that they did in Weston, it was the communications center. The only way you got into it and out of it was by boat, but it still served the people well and immediately they worked at cleaning up as you have cleaned up here.

Just commenting on Congressman Murphy's remarks, I think he has hit the points well. There is no doubt that a serious and immediate look must be taken at flood control remedies. Millions of dollars of damage, hundreds left homeless unfortunately in West Virginia and perhaps in Pennsylvania. There are many remedies suggested but it is important that at this time we have a comprehensive and total flood control plan.

Congressman Staggers and I yesterday introduced a bill directly authorizing the Corps of Engineers to perform that overall flood control study of the Monongahela River basin and to analyze the different types of flood control methods. Whether this answer is dam, flood walls, stream channelization, nonstructural alternatives, or perhaps some combination of all of them in different places, it is important that the men and women of the Monongahela River

basin know that there has been this study undertaken and that there will be relief. And we must begin that study now, agree on a strategy, pass the necessary legislation, get the money, and start work immediately guaranteeing this flood will never occur again.

It is possible that the corps already has the authorization to do this study, in talking with some of the Corps of Engineers people, because there have been previous studies done of the Monongahela River basin. In light of the tragedy that has come, it is time that we look and see whether technology has brought us new ways of approaching it and guaranteeing that we are going to approach this on a comprehensive and integrated basis so all areas of the Monongahela River basin are protected and we never have to have this tragedy happen again, and we never have to meet like this again either.

So, thank you very much for calling it and I hope this will be the first of several hearings. I think you really have started something here.

Mr. ROE. I thank the gentleman from West Virginia.

Now our second witness this morning, is Brig. Gen. Peter J. Offringa, who is Commander of the Ohio River Division, U.S. Army Corps of Engineers, accompanied by Col. Richard Rothblum, Commander of the Pittsburgh district.

I would request, General, if you would introduce your other colleagues for the record. We have your statement, so you may proceed.

TESTIMONY OF BRIG. GEN. PETER J. OFFRINGA, COMMANDER, OHIO RIVER DIVISION, U.S. ARMY CORPS OF ENGINEERS; ACCOMPANIED BY COL. RICHARD A. ROTHBLUM, COMMANDER, PITTSBURGH DISTRICT; ED KOVANIC, CHIEF OF ENGINEERING, PITTSBURGH DISTRICT; DICK ARMSTRONG, CHIEF ENGINEER OHIO RIVER DIVISION; AND GEORGE CINGLE, PITTSBURGH DISTRICT

General OFFRINGA. Thank you very much, Mr. Chairman.

Mr. Chairman, ladies and gentlemen, good morning. As indicated, I am Commander of the Ohio River Division of the Corps of Engineers, and I brought with me some additional colleagues, so we will have the expertise necessary to answer any questions that you may have.

Starting from the left, it is Mr. Ed Kovanic, who is the chief of engineering of our Pittsburgh district.

Next to him is Col. Richard Rothblum, who is commander of the Pittsburgh district.

Then we have Mr. Dick Armstrong, who is the chief engineer of the Ohio River Division.

And finally, Mr. George Cingle, who heads the planning effort in the Pittsburgh district.

We are very pleased to be here with you to answer your questions and to describe the Corps of Engineers actions during and after the flood of early November 1985.

I might point out that these actions are typical of the Corps of Engineers efforts, which have saved the Nation over \$129 billion in

damages at a cost of \$18 billion, which was a return of \$7 for every \$1 invested.

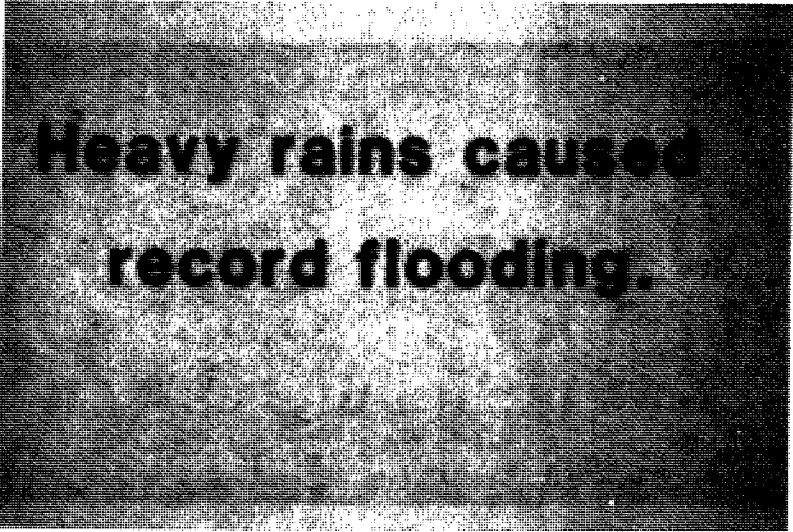


I will address our actions in these areas in which the Corps of Engineers has responsibility. They are shown here on this slide.

- 1. Operation of Corps Flood Control Structures**
- 2. Maintenance of Navigation**
- 3. Support to FEMA**

The operation of our flood control structures in the Monongahela River watershed, maintenance of navigation on the Monongahela River, and support to the Federal Emergency Management Agency or FEMA, in flood damage assessment and recovery operations.

Now, in assessing the November floods, I have reached the following conclusions:



**Heavy rains caused
record flooding.**

First, the rains during that period were of record proportions in parts of the valley and were of a magnitude which created flooding that can be expected to occur only once every 100 to 500 years.

● **Structures prevented major
additional damages.**

Corps restored navigation.

Corps supported FEMA.

Second, the corps flood control structures in the Monongahela River watershed were operated precisely as designed, held back unprecedented volumes of floodwaters, and prevented major additional damages.

Structures prevented major additional damages.

Corps restored navigation.

Corps supported FEMA.

Third, the corps personnel, minimized a major navigation disaster on the Monongahela River by restoring navigation on the river in record time, saving the region millions of dollars.

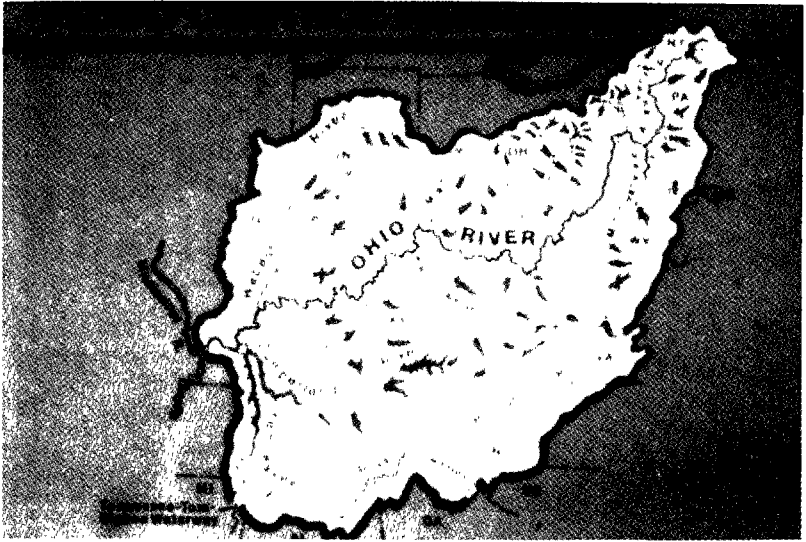
Structures prevented major additional damages.

Corps restored navigation.

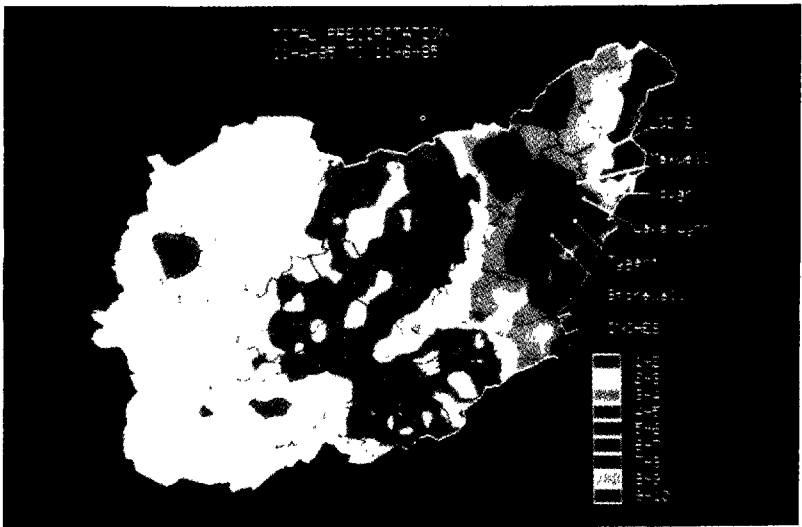
Corps supported FEMA.

Corps personnel provided responsive support to FEMA in disaster recovery operations.

The remainder of my report will further develop these four points.



This shows the Ohio River Division and the location of the Monongahela River in respect to all the other flood control dams and facilities which we have within the division, which is shown in blue on the map. I will briefly go over the map and show you that area. We are talking about the area right up here in the upper headwaters of the Ohio River Basin, Monongahela River running northward from West Virginia ultimately joining the Allegheny at Pittsburgh.



The immediate cause of the flooding was extremely heavy rain which fell in a concentrated and basically uncontrolled area. Eight inches of rain fell in less than 24 hours on November 4, 1985, and the National Weather Service reported a rainfall total of over 14 inches during the period November 1-5, 1985. This slide shows the full extent of that rainfall. You will notice from the color coding that where you see the purplish and greenish working on down through the red and the brown, those were the areas of the heaviest rainfall. You can see those were concentrated in an area which is about halfway down the eastern boundary of the division area.

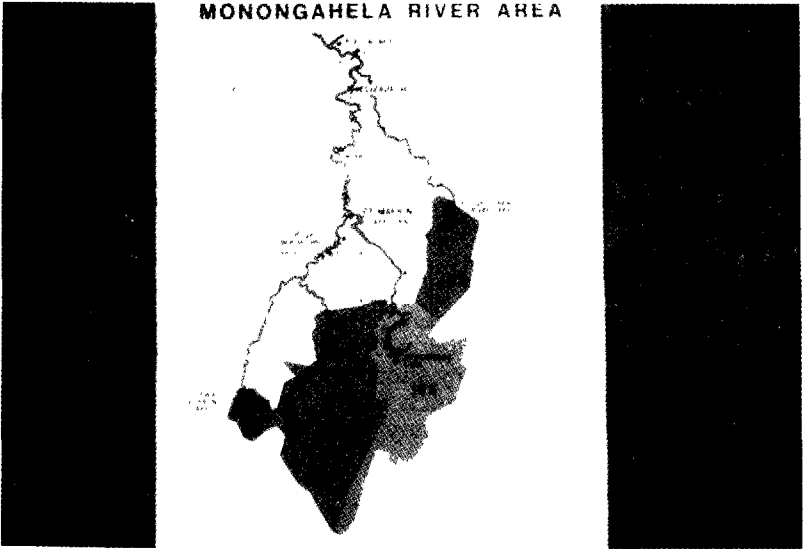
You will note also that that rainfall was concentrated in the drainage basins of the Cheat River while very little rain fell in the basin of the Youghiogheny River. This rainfall distribution pattern caused an unusually heavy flow of floodwaters into the upper Monongahela River basin in a very short period of time. Flows from the Youghiogheny system were much less in volume. Note the location of Tygart Dam and Youghiogheny Dam in relation to the rainfall pattern.

Monongahela River NOVEMBER 1985 FLOOD	
LOCATION	FLOOD FREQUENCY
Braddock, PA	45 year
Elizabeth, PA	80 year
Charleroi, PA	110 year
Greensboro, PA	exceeds 500 year
Point Marion, PA	exceeds 500 year

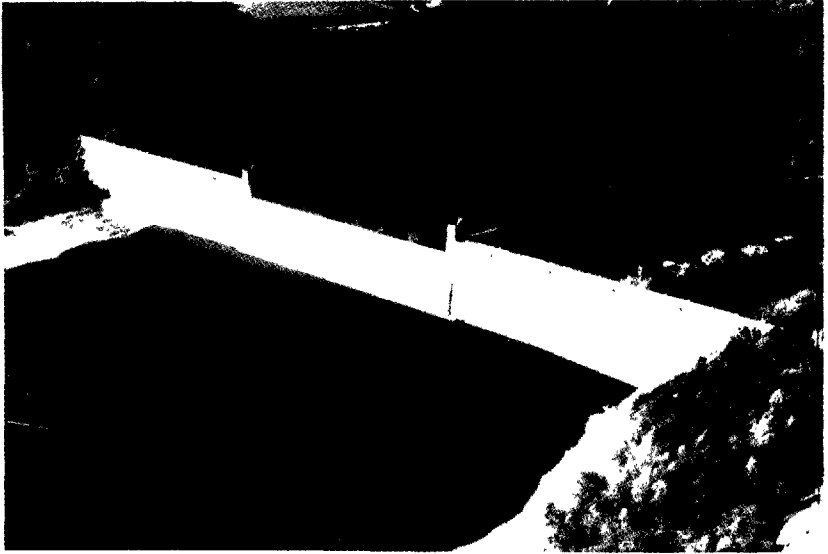
This next slide shows approximate flood frequencies at various points along the Monongahela River. As you can see, the flood in the middle Monongahela River exceeded a 100 year frequency while the upper Monongahela River was subjected to floods in excess of a 500 year frequency. The resulting flood surpassed that of 1967 and is the new flood of record at many stations along the Monongahela River.

Recognizing that the Monongahela Valley was experiencing a flood of unprecedented proportions, the next issue addresses how the Corps of Engineers flood control structures were employed to capture the waters.

MONONGAHELA RIVER AREA

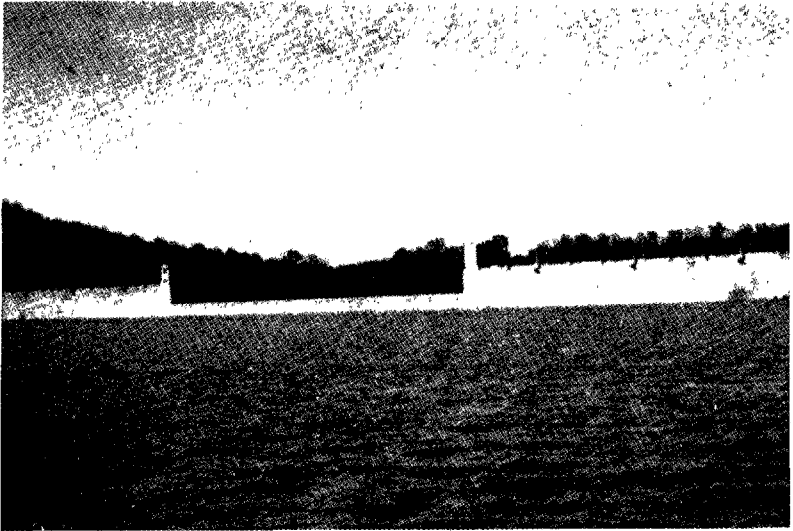


The first significant point to be made is that the two completed corps flood control dams control floodwaters from only about 22 percent of the entire basin. Those are the two areas shown in gray on the upper and lower part of the slide, and they reflect the basin that goes into the Youghiogheny Reservoir to the north and the area that goes into Tygart Reservoir on the south. So, in other words, 78 percent of the Monongahela River watershed remains uncontrolled. As you can see from this slide, Tygart controls 16 percent of the basin and Youghiogheny controls another 6 percent.



Flood runoff was stored at both Tygart and Youghioghenny Reservoirs during the flood period. This shows a slide of Tygart with its normal pool and what I would like you to know is the distance to the spillway, that cut in the center, down to the level of the pool, which is a distance of about 110 feet, so you have that in perspective. At the beginning of the rainfall in early November, both reservoirs had over 80 percent of their storage capacity available to store the incoming flow. Since the rainfall was heavier over the upper Monongahela River basin, 86 percent of the available storage was utilized in Tygart Lake while less than 30 percent was used in Youghioghenny Lake. Incidentally, our Tygart Lake was a fill of record. We never have had that much water in it before.

Our review of the events of early November assures us that the operation of these facilities was in accordance with longstanding flood control plans for reducing flooding downstream.

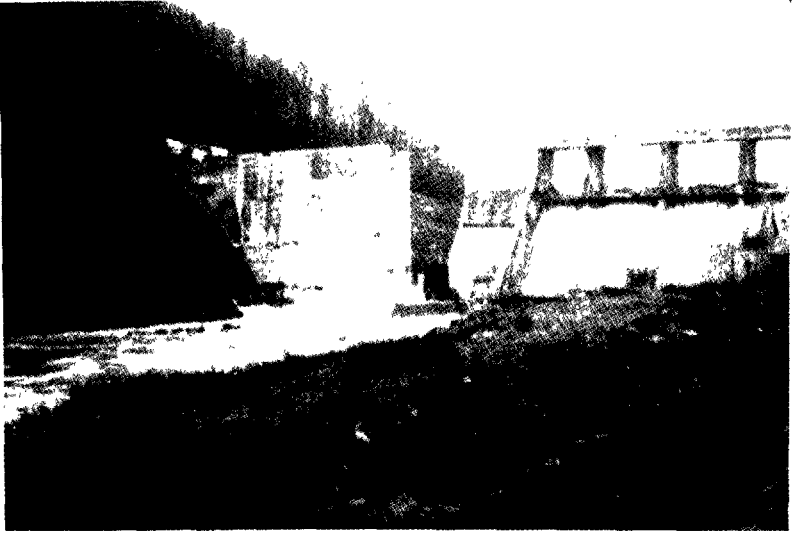


I am going to show you a slide of the same reservoir, looking at the record fill that we had as a result of the waters that were stored. Indeed, as you can see in this slide, Tygart Reservoir reached a record pool level rising over 89 feet in 48 hours to a point just 10 feet below the spillway. Tygart and Youghiogheny Reservoirs reduced flood crests from 5 to 10 feet, depending upon location, along the Monongahela River and prevented additional flood damages estimated at more than \$202 million.

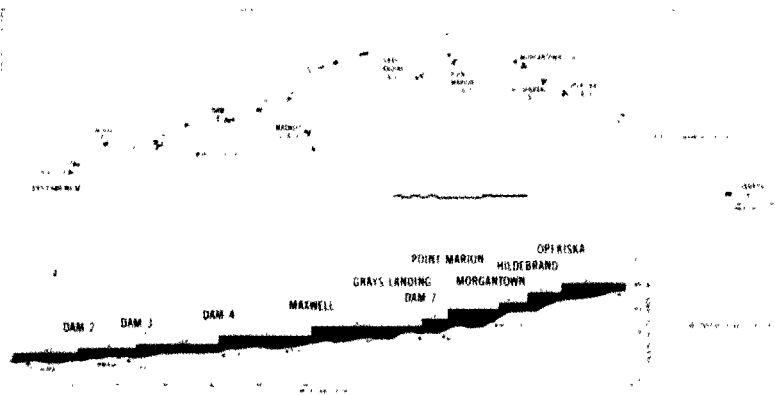
DAMAGES PREVENTED

	REDUCTION (FT) DUE TO RESERVOIRS	DAMAGES PREVENTED (\$ MILLION)
Morgantown, WV	6.9	\$ 53.5
Greensboro, PA	7.1	70.0
Elizabeth, PA	6.7	51.0
Braddock, PA	7.4	15.8
Pittsburgh, PA	5.1	10.4
	Total	\$ 200.7

This slide shows the reduction in feet and damage prevented in millions of dollars at various points in the Monongahela River Valley by these two reservoirs.



Stonewall Jackson Dam is now under construction in Lewis County, WV. Even in its partially completed state, the dam prevented an estimated \$24 million in damages by reducing flood crests in Weston and Clarksburg, WV, and on the Monongahela River.

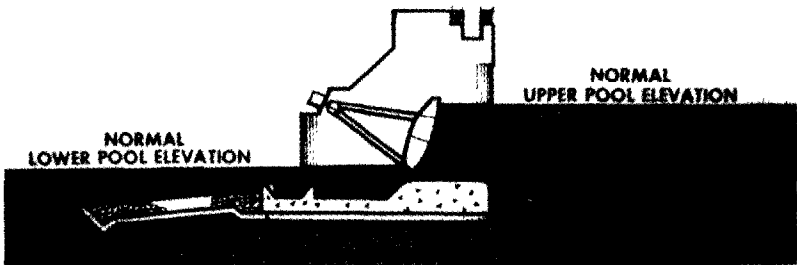


You will note I have yet to mention our nine navigation locks and dams on the Monongahela River or the hydroelectric power generation dam at the West Penn Power Co.'s Lake Lynn on the Cheat River. This deliberate omission was made to emphasize that none of these structures has any capability to control floodwaters. They were not authorized for that purpose, not designed to impound floodwaters and were, therefore, constructed to allow free

movement of floodwaters downstream with no effect upon the volume of the flood.

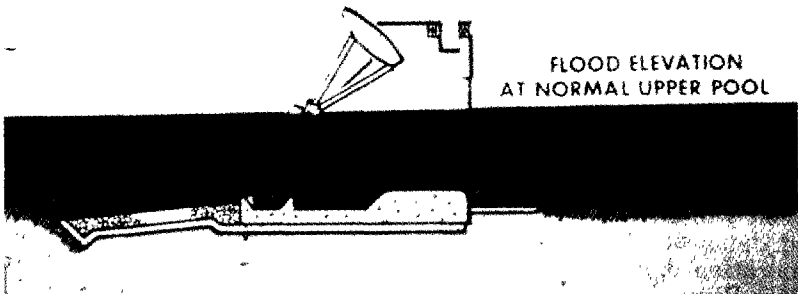
It has been alleged that the corps did not operate the navigation dams on the Monongahela River to prevent flooding. That is true, because the dams are not designed to prevent flooding, although this is a popular misconception.

Navigation Dam NORMAL CONDITION



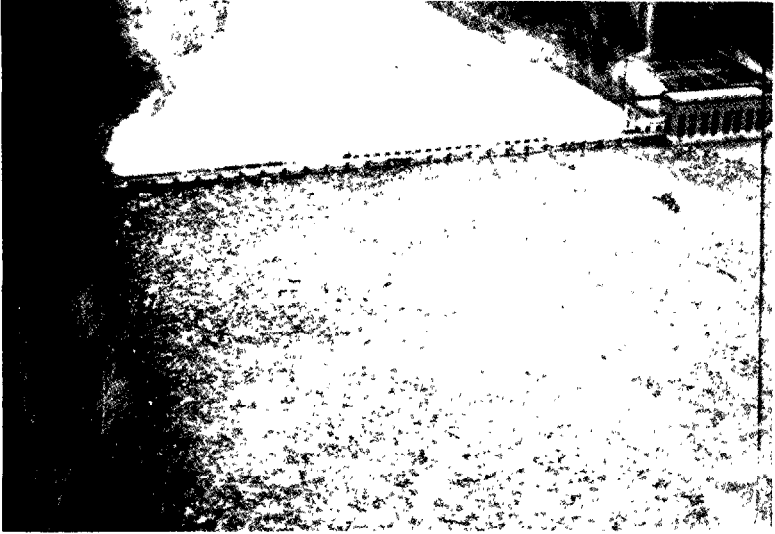
As shown on this schematic, these navigation dams are authorized and designed only to provide adequate depths of water during moderate to low flow periods. These Monongahela River navigation dams were operated precisely as intended, and neither increased nor reduced the height of floodwaters during the early November flood.

Navigation Dam FLOOD FLOW CONDITION

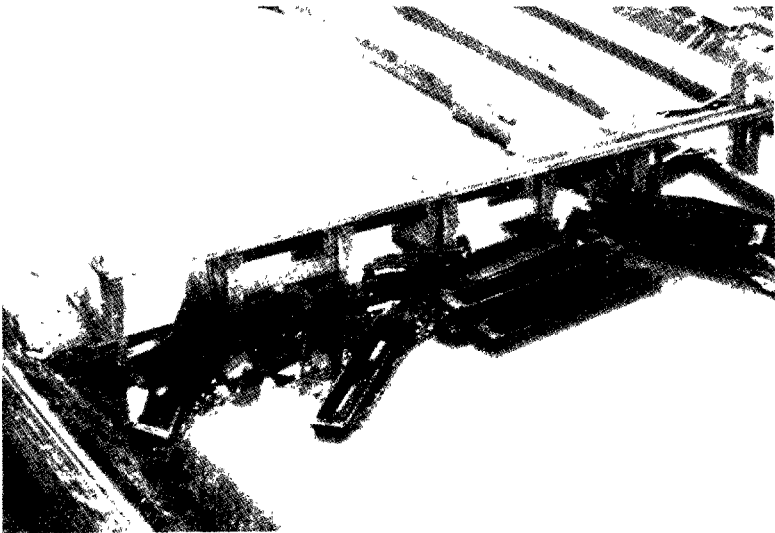


Now, when we get high water, the only thing that we can do with these dams is to simply raise the gates, and as you can see on the slide in that condition, the river operates as though the dam

were not even there. You simply have a flow of the river exactly as you would have if you had free run.



The dam at Cheat Lake, also called Lake Lynn, is owned by West Penn Power Co. and was designed for hydropower. The reservoir contains no storage for flood control and is not operated for flood control purposes. The project is licensed by the Federal Energy Regulatory Commission.



After the floodwaters subsided, navigation had to be restored on the Monongahela River. We spent 6 weeks removing over 25 barges at locks and dam 2 and Maxwell locks and dam. The situation at Maxwell was particularly acute. The 18 barges that were lodged against the dam and through the gates were twisted in such a fashion that we could not close the gates and as a result the pool was lost.

Losses to shippers and waterway users were estimated at over \$500,000 a day. The barge removal operation was a time consuming, tiresome, high risk operation completed without injury or loss of life. During the cleanup at Maxwell Dam, the release of floodwaters stored behind the Tygart Dam had to be carefully controlled and balanced in order to prevent a disastrous loss of municipal water supply without disrupting the barge removal operations. It should be noted that over 50,000 people depended upon that pool for water supply, so our challenge was to maintain sufficient water to keep the water intakes covered while reducing the flow sufficiently so that our barge removal operation could continue without disruption. This operation succeeded because of the dedication of a professional, technically proficient work force.



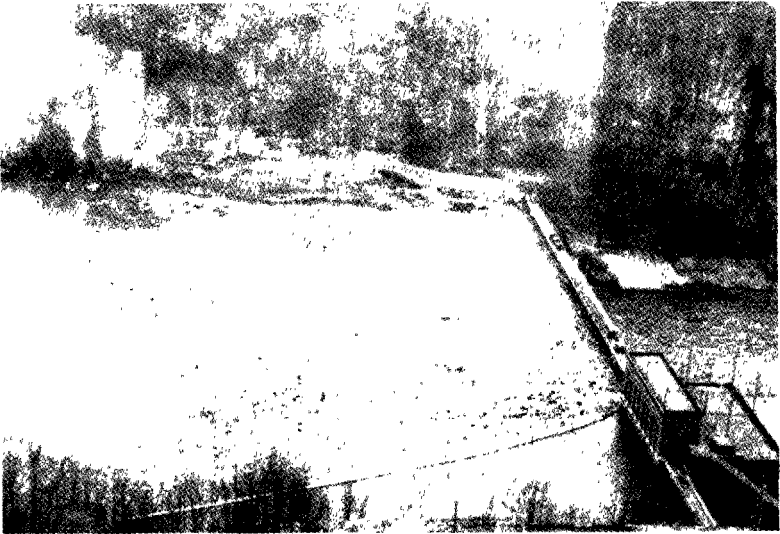
Finally, let me say a few words about the corps support to FEMA after the flood. As you may know, we prepare damage survey reports and provide construction management support as requested and coordinated by FEMA.

The Corps of Engineers provided 16 people to prepare damage survey reports in support of FEMA's Pennsylvania disaster recovery operation. A disaster field office was established in Charleroi, PA, where the corps, FEMA, and the Commonwealth managed the Pennsylvania recovery operation.

During a 3-week period, the corps prepared 490 damage survey reports in the 5 Pennsylvania counties declared disaster areas.

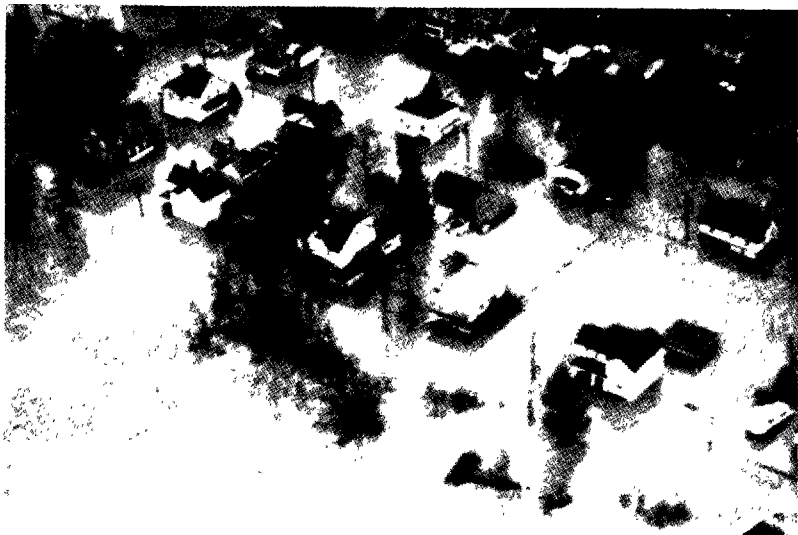


Repair work to public roads, bridges, water and sewer facilities and debris removal totaled \$3.5 million.



The Lake Lynn debris removal and damsite cleanup for FEMA cost nearly one-half a million dollars and is proving to be a unique task. The corps contractor uses cable to pull debris to shore, removes it with hydraulic backhoe equipment, and then pushes it up the bank with a bulldozer for on the spot burning and/or disposal in an approved landfill.

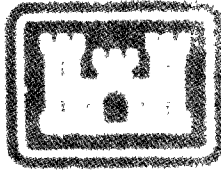
In summary, what occurred in the Monongahela River basin was an abnormal rainfall that spread over much of the uncontrolled basin area.



Runoff from this rainfall produced the flood of record for many communities in its path.

During the period of record flooding, the corps operated its facilities to maximum effectiveness. In spite of our control of only 22 percent of the watershed, we were able to prevent over \$200 million worth of damages. Our response to the Monongahela River navigation crisis significantly reduced the severity of the disaster. Finally, through our support to FEMA, we played a major role in repairing the damage and cleaning up the debris when the floodwaters receded.

This was a flood of unusual severity, that required a quick and dedicated response. I am proud of the accomplishments of our corps people in response to this challenge.



US Army Corps of Engineers

Many of the people in our Pittsburgh district who participated in the recovery work, are residents of this area, and I would like to take a minute, with your indulgence, Mr. Chairman, to recognize these people in front of their neighbors. Some of them, unfortunately, cannot be with us because they are going about their duties within the district, but I would like to mention Mr. Fred C. Black, Greensboro, PA, superintendent repair party, Pittsburgh district, Monongahela River; Phillip L. Gideon, Carmichaels, PA, barge removal, Diesel Electric Striker; William E. Dowlin, Waynesburg, PA, maintenance mechanics leader; Rodney Patterson, Dilliner, PA, lock operator Opekiska, did cleanup at lock 7.

We also have two of our corps employees of longstanding, who are actually present with us. I would like to have them please stand up as I mention their names. Mr. George Trew, Point Marion, PA, who is lockmaster, at Point Marion; and Sheldon McKee, of Greensboro, PA, who is lockmaster of lock 7.

Sheldon was telling me earlier this morning that he had dismantled the machinery on his lock prior to it going underwater 39 times in the 22 years that he has been working on the waterway. And I told him that probably indicated that he knew how to do it very well.

I am proud of the accomplishments of our corps people, particularly those in the Pittsburgh district, in response to this challenge.

Thank you for your attention. I will now answer any questions you have.

Mr. ROE. We want to thank you for your presentation. The slides have been very helpful in giving us a clearer picture of what actually happened.

Now, are there any questions from members at this moment?

Mr. MURPHY. I would like to ask—General, good morning, Colonel. I had spoken with you previously, General, on the question I raised in my opening statement, why did not the corps, although you have advised me you are primarily navigation, why, in anticipation of high water and heavy rain—you get a notification from the Weather Service it is raining in West Virginia—why can't you

shut down the navigation on the Monongahela River from Pittsburgh to Point Marion, lower the pools, the whole 70 or 80 miles—I don't know how long it is, it is a long distance—thus reducing and making room for an onslaught of water that comes down? And if you did lower the pools, how much water are you able to absorb?

The whole thing is, make room for the water that you know is coming. The same thing I would ask of course of the power company, why they couldn't drain, shut down the electric power, drain Lake Lynn and make room for the water that was coming? Can you tell me if that is feasible and how much water you could store?

General OFFRINGA. Yes sir. Theoretically, what you would propose is possible. I think, however, you have got to look at the perspective in terms of what you would be able to capture—volume and timing—in the Monongahela River versus the volume of floodwater that is coming down.

If you look at all of the locks and dams that run over that area in which you were discussing, we calculate that the pool storage capability if we were to open the gates and allow the pools to run down, is about 30,000 acre-feet. That is basically an acre of water a foot deep. So you have 30,000 acre-feet. To put that in perspective, the total volume of floodwaters that were coming down the Monongahela River during the duration of the flood was about 600,000 acre-feet, so if you were to do that, you would capture roughly 30,000 of the 600,000. That would result in only a few inches of flood reduction along the banks of the river, and this only after a perfectly timed gate operation based on a perfect forecast of flow.

In doing that, you would create other effects that would be of detriment to the river. First of all, as you pointed out there would be a disruption to navigation.

Second, all of the barges that are moored in the river, along the banks, would be grounded. We are talking probably on the order of thousands of barges. Those that were loaded would probably be structurally damaged. Those unloaded would sink into the mud and it has been our experience when water comes back up again, the suction of the mud on the barge is generally sufficient to keep it from rising with the water and so the barge companies would probably lose a large percentage of their barges going underwater.

In addition to that, when you take the water out of the pool, one of the things that we worry about—for example, in the Maxwell loss of pool from the barges—is that when the water goes out of the pool, and the pressure against the banks of the water that is normally there is gone, what happens is the banks start to cave. In the first Maxwell loss of pool several years ago, we actually lost some of the railroad embankment and the rails fell into the riverbed.

In addition, once that water then starts filling that pool again, you have got extensive erosion problems because the current of that water is then going to cut into the sides of the bank.

Finally, I would imagine that there would be a detrimental effect to your fish and water quality as a result of constantly lowering those pools.

So, in summary, you get very little effect, if any, that is certainly negligible in terms of flood reduction. On the other hand, there are some very serious, detrimental effects that would occur if you lowered the pool.

As a final point, I would note again, that the ability to lower those pools in a timely, effective manner is dependent upon the accuracy of the weather forecasts and flood stage forecasts by the National Weather Service. We don't want to get into a cry-wolf syndrome where we are constantly lowering pools in anticipation of rainfall and floods that do not occur.

Mr. MURPHY. Another question, General. Can you tell the committee what would be the cost of the Rowlesburg Dam, if you have an estimate, and then relate that to the cost effectiveness of the cost of the dam relating to the amount of damage that it would reduce to downstream property owners?

General OFFRINGA. The cost of the dam in current year dollars—again this is a rough estimate based upon simply taking the cost in the last study that we have and updating it based on increased changes in the discount rate, would be about \$400 million. That would include not only construction of the dam but the purchase of all of the land required. Hydroelectric power development will add about \$350 million in addition to the cost of the dam.

The benefit of that is in terms of downstream benefits, on an annualized basis again, based upon simply updating the figures from the last study, without actually examining the premises upon which those figures were developed, comes out on an annualized basis—which again is figured on a different basis than your \$400 million lump sum—on an annualized basis, is about \$121 million in annualized benefits.

I might point out that of that figure, about \$8 million is flood control benefits and the majority of benefits—\$68 million approximately, would be as a result of hydropower, and about \$38 million would be in low flow augmentation benefits and the remainder would be in recreation and redevelopment benefits.

Mr. ROE. For the record, General, could you tell us, if that reservoir were built, regardless of all of the other facilities, what percentage of the basin would that control?

General OFFRINGA. That would control 13 percent more of the basin, sir.

Mr. ROE. So from a point of view that even if that dam were built that is not the resolution of this entire problem?

General OFFRINGA. It would not resolve flooding in the entire Monongahela River Valley.

Mr. MURPHY. What would be your estimate if the project remained authorized and then secured funding, what would be your estimate of time of construction?

General OFFRINGA. Our estimate would be from the time that it was authorized, it would take us about 7 to 8 years to construct.

Mr. MURPHY. General, as I understand your most recent statistics, 13 percent you just gave to Chairman Roe, in other words, with the Tygart in place, with the Youghiogheny Dam in place, you are still talking about only controlling 35 to 40 percent of the floodwaters?

General OFFRINGA. That is essentially correct. Let me give you all the figures for the record—16 percent attributed to Tygart, 6 percent attributed to Youghiogheny, 13 percent to Rowlesburg, and an additional 2 percent to Stonewall Jackson when completed, and I think that totals 37 percent.

Mr. MURPHY. What about the rest?

General OFFRINGA. The rest is essentially uncontrolled.

Mr. MURPHY. What is the danger then of leaving the rest? If you are going to get hit by a flood does it make a difference where the water comes from, can you tell us that?

General OFFRINGA. It depends upon where the water is relative to where the flood control capability is. If the rainfall is centered in one of the basins that is controlled, essentially you will have very little flooding. If the rainfall is centered over an area of which we have no control, and it is of the severity of a 500-year flood, then you will have significant flooding.

Mr. MURPHY. Where else is there water to come from in your basin? You showed us you only have the Monongahela River, the Fork Branch, the Youghiogheny, the Cheat. Where else would water come from to account then for 65 percent more water or 63 percent more water?

General OFFRINGA. Well, it would come from the other streams and tributaries into the Monongahela River.

Mr. MURPHY. All of the small ones?

General OFFRINGA. All of the smaller ones. That is a tremendous area. In the Youghiogheny/Monongahela River basin, we are talking about 7,382 square miles, which is a tremendous area.

Mr. MURPHY. But that is the entire Youghiogheny/Monongahela River basin then?

General OFFRINGA. That is correct, sir.

Mr. MURPHY. Counting Sudersville, and Redstone and everywhere else?

General OFFRINGA. That is correct.

Mr. MURPHY. Thank you.

Mr. CLINGER. General, I know, that hindsight is a lot better than foresight and that nobody can anticipate 100- or 500-year flooding situations from occurring. Knowing what you know now, is there anything that you would have done differently than you actually did at the time of the flooding?

General OFFRINGA. We have reviewed in great depth and detail everything we did from the beginning of that emergency until the end, and having completed that review, we feel there is nothing additional that we could have done that we didn't do. There is nothing we could have done more effectively.

Mr. CLINGER. If there was something in addition that could have been available and in place, one thing that might have mitigated this more than anything else, what would that have been?

General OFFRINGA. Well, for this particular flood, with 55 percent of the floodwaters coming down the Cheat basin, some sort of flood control capability on that Cheat River would have been the thing that would have prevented almost all of the significant and damaging flooding.

Mr. CLINGER. The Rowlesburg Dam would have had significant impact on this particular flood?

General OFFRINGA. In this particular case, because of the distribution of the rainfall. It would have had a major impact.

Mr. CLINGER. Your point is you can't predict that that is going to happen, is that correct?

General OFFRINGA. That is correct.

Mr. CLINGER. Thank you.

Mr. WISE. I think that Congressman Murphy brought out some good points, particularly that we are still talking even with the Rowlesburg Dam having been completed, still talking 35 percent of the Monongahela River basin covered. I just wonder, General, let me ask in the normal course of things, the way the corps operates, even if this committee were to take Rowlesburg off of the list, the authorizing list, you would still, I would think, undertake a study to update the work that you had done I think about 10 years ago, isn't that the case?

General OFFRINGA. Anytime we have a flood of this magnitude it is our standard procedure to gather all of the data we get as a result of flooding, to update all of our hydrological data, take that data and bounce it against all of the existing projects and studies that we have undertaken within the valley. Now, the Monongahela River Valley has been studied by the corps since 1936 and we have extensive quantities of both local and large projects studies that have been determined to be nonfeasible for either economic or engineering or local support purposes. So it would be our intent under any scenario, to go back, update our hydrology and then do an additional assessment of all of those projects in order to determine whether anything had changed significantly enough for us to go in and do a reconnaissance report and determine if those things were feasible.

Mr. WISE. Hasn't the problem in the Monongahela River Valley been, whether we are talking about Rowlesburg Dam or talking about some other alternative tributaries, hasn't the problem always been the cost/benefit analysis and the fact that you don't always get a one to one dollar spent bringing back a dollar of—

General OFFRINGA. Most of the local protection projects studied in the past did not have benefits greater than costs. However, there are a significant number that did, but that we were unable to record sufficient local support for and, therefore, work on these projects had to be terminated.

Mr. WISE. You and I have discussed the overall study of the Monongahela River basin. I was talking about earlier, Congressman Staggers and I introduced a resolution. I remember you saying perhaps that the legislation wasn't even necessary, that you might have the authority, but that it would help as far as getting funds for such a study, and I just wondered, I know that I would, in addition to introducing the resolution, would like to request you undertake that study because it is going to have to be something that is done anyhow in order to prepare looking at Rowlesburg or looking at anything else, and my hope is maybe we can drum up some support for that.

I know in Congressman Murphy's district and the five counties I represent in the Monongahela River basin and Congressman Staggers and Congressman Mollohan's, it is clear that we have got to take an overall look at this again and perhaps some of the premises upon which we base—on which earlier conclusions were based, perhaps a change or perhaps we are going to have to have legislation to waive some of that. So I would urge that the corps do consider that because I think the Monongahela River basin is going to be a hot topic for upcoming months.

Thank you very much.

General OFFRINGA. Thank you, sir.

Mr. ROE. There is one hole in the testimony that I find. You gave a good explanation of the situation as far as the dams controlling the locks are involved, but you did not speak to the power dam situation of which Congressman Murphy is concerned. Why didn't somebody think about reducing the level of it. I can't remember the name of the power dam.

General OFFRINGA. Lake Lynn.

The people who are best qualified to address that are obviously the Federal Energy people, who are going to testify later. From a strictly flood control point of view, you have the same problem with the storage capacity of Lake Lynn as you have with the locks and dams. If that is being designed solely for power generation, the lowest you can take that is the level of the penstock which is where the water comes out. If you take it down that far you will generate 29,000 acre-feet of storage. Again, you are talking about 29,000 acre-feet versus 630,000 acre-feet.

Mr. ROE. In envisioning this reservoir you can only technically draw down to a certain level, the penstock level, is that correct?

General OFFRINGA. Yes, sir.

Mr. ROE. What of that Lynn Reservoir? I am from New Jersey, it takes me longer to catch up. What is the level? Is that a third of the way down or a quarter of the way down?

General OFFRINGA. Total capacity of that is 72,000, so you are talking about roughly 30 percent.

Mr. ROE. So from what I understand, that you could technically you could draw down only 30 percent?

General OFFRINGA. That is correct.

Mr. ROE. Simply because it is not technically possible, it is not built that way?

General OFFRINGA. That is my understanding. Again, I defer to the—

Mr. MURPHY. From what you explained then you got 30,000 acre-feet of storage in the Monongahela River navigational capacity, approximately 30,000 acre-feet of storage at Lake Lynn, that is 60,000 feet, or 10 percent of the total amount of water that you contend will hit us. That would reduce it by 10 percent, wouldn't it?

General OFFRINGA. Well, it would reduce the volume of the flood by ten percent, but not the peak when you look at the flow going down the river; and then the effect of the spreading, because fundamentally what you are doing when you have that kind of water pouring, for example when I change the oil in my car I pour it too fast into the funnel, it spills over the top. That is the same situation you have when the water is trying to go—it can't get down there fast enough so it spreads out. You will absorb some of the water in the channel. When you look at the net effect of that going out and spreading out over the land, the net effect of both of those combined would be a very minor decrease in terms of flood height reduction, if any.

Mr. MURPHY. Has the corps ever considered taking over by eminent domain the dam and Lake Lynn, dredging it and using it as a storage capacity, perhaps increasing this 30,000 to a higher figure, and minimizing our damage?

General OFFRINGA. We have not considered that. It wasn't looked at—the only time that that facility was considered in terms of its effect on flooding was when the Rowlesburg Dam was being considered. That was to regulate the flow. What you would fundamentally have to do is to reestablish an outflow capability at a lower point in the dam, and firstly, that would be enormously expensive because you would have to drill through the existing concrete.

Secondly, I am not sure what the net effect of that would be in terms of flood reduction in the backup of the water and the safety and structural integrity of the dam.

The simple answer to your question is no, we have not looked at that.

Mr. CLINGER. Is it my understanding that the corps does have the authority to review FERC licenses to consider what possible flood control aspects could be incorporated into that license. It is my understanding that the license was up for review within the last 10 years. Did the corps at that time have any input into the process and take a look at the potential flood control aspects of this dam?

General OFFRINGA. We, as a matter of course, comment on all FERC licenses as they affect our existing navigation and flood control capability. Whether we commented in the seventies—I am sure we did—but I don't know what our specific comment was.

Mr. CLINGER. When was the last time that——

General OFFRINGA. October 21, 1970 was the last time of renewal of that license.

Mr. CLINGER. Can we maybe have that for the record and if you did indeed provide some input, or review of the license?

General OFFRINGA. Yes, we can provide that.

[The following was received from General Offringa:]

ENGCH-EP

29 January 1965

Honorable Joseph C. Swidler
Chairman, Federal Power Commission
Washington, D. C. 20426

Dear Mr. Swidler:

Reference is made to the Commission's letter dated 21 October 1964 concerning the application for major license filed by West Penn Power Company for constructed hydroelectric Project No. 2459, located on the Cheat River, in West Virginia and Pennsylvania.

The applicant's project is located about 41 miles downstream from the site of the multiple-purpose Rowlesburg Reservoir which is currently under study by the Corps of Engineers in connection with the Cheat River review study. That report is to be submitted to Congress in response to resolutions of the Senate and House Public Works Committees dated 30 April 1958 and 3 June 1959 respectively. The report has been submitted to Federal and State agencies for their comments, receipt of which has been requested by 4 March 1965.

One of the purposes of the proposed Rowlesburg Reservoir would be provision of releases for water quality control below the applicant's project. If and when the Rowlesburg Reservoir project is constructed, accomplishment of this purpose would require that Rowlesburg project water quality releases be passed through the applicant's reservoir in a manner to insure the benefits intended. Accordingly, the license, if issued, should include a provision worded somewhat as follows: "The operations of the licensee, so far as they affect the use, storage and discharge of water quality releases from the proposed Rowlesburg Reservoir, shall be controlled at all times by such reasonable rules and regulations as the authorized representative of the Secretary of the Army may prescribe in the interest of maintaining these water quality releases for the purpose intended." In this connection, the District Engineer's report referenced above includes discussion of water quality control

releases from the applicant's project. Also, for your information, Exhibit D, Appendix 1 of the application includes a provision for releases specified as a condition for the original approval of the applicant's dam by the Secretary of War, 12 July 1912.

The license, if issued, should specify that releases from the applicant's project during flood periods should not exceed flows which would have occurred in the absence of the project. Operating procedures to assure compliance with this requirement should be developed in cooperation with the District Engineer, U. S. Army Engineer District, Pittsburgh.

The interests of navigation would be satisfactorily protected by including in the license the terms and conditions relating to navigation as shown in the Commission's Form L-3 (1 August 1964). The plans of the structures affecting navigation are satisfactory.

One copy of the application is returned as requested.

Sincerely yours,

1 Incl
 Appl. for Lic.
 Project No. 2459

S. W. PINNELL
 Lt Colonel, Corps of Engineers
 Assistant Director of Civil Works
 for Central Divisions



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
OHIO RIVER DIVISION, CORPS OF ENGINEERS
P. O. BOX 1159
CINCINNATI, OHIO 45201-1159

ORDED

12 February 1986

SUBJECT: Congressional Hearing on Monongahela River Flooding

CDRUSACE (DAEN-CWR-L)
20 Mass. Avenue, N.W.
WASH DC 20314-1000

1. Congressman Roe's subcommittee on water resources conducted a hearing in Point Marion, Pennsylvania on 7 February 1986 on the flooding that occurred on the Monongahela River in early November 1985. General Peter J. Offringa, Division Commander of the Ohio River Division, made a presentation during the hearing and answered questions by subcommittee members.
2. One request by the subcommittee was to furnish copies of the Corps' comments on the FERC permit issued on the Cheat Dam in 1970. A copy of the entire chain of correspondence with the final comments to FERC along with a final copy of the license is enclosed.
3. Article 33 of the license requires that the licensee not release any flow during flood periods in excess of those flows that would exist if the dam were not constructed. As far as we can ascertain, the licensee was in compliance with this article during the flooding in early November 1985.
4. Please provide the enclosed data to Congressman Roe and/or his committee staffers, as appropriate. Also, please let me know if the committee needs anything else from this office.

FOR THE COMMANDER:

RICHARD C. ARMSTRONG, P.E.
Chief, Engineering Division

Encl

FROM ORD
FILES
(17)

UNITED STATES OF AMERICA
FEDERAL POWER COMMISSION

License (Major) - Constructed Projects - Water Quality - Environment

Before Commissioners: **John N. Nassikas, Chairman;**
Lawrence J. O'Connor, Jr., Carl E. Bagge,
John A. Carver, Jr., and Albert B. Brooks, Jr.

West Penn Power Company) Project No. 2459

ORDER ISSUING LICENSE (MAJOR)

(Issued October 21, 1970)

Application was filed on April 8, 1964, and supplemented on September 8, 1964, and October 20, 1965, by West Penn Power Company (Applicant) of Greensburg, Pennsylvania, for a license under Section 4(e) of the Federal Power Act (Act) for constructed Project No. 2459, known as Lake Lynn Hydro Development, located on the Cheat River, a tributary of the Monongahela, River, in Monongalia County, West Virginia, and Fayette County, Pennsylvania. No lands of the United States are affected by the project.

According to the application, construction of the project commenced in 1912. In 1913 construction of the dam was halted. It was resumed in 1925 and completed on May 31, 1926, when the first generating unit of 12,800 kw was placed in operation. Three other units, each of 12,800 kw capacity, went into operation by September 26, 1926. There has been no project construction since the 1935 amendment to the Act.

The Department of the Interior, in reporting on the application, has advised that while the project reservoir is open for free recreational use, access facilities are either inadequate or will become so in the near future, and the Department recommended for inclusion in any license for the project the conditions in the interests of fish, wildlife and recreation, as set forth in attached Form L-3.

There are no historic properties listed in the National Register established under the provisions of Public Law 89-665 (80 Stat. 915) in the vicinity of the project.

The Department of Health, Education, and Welfare (now the function of the Federal Water Quality Administration) has advised that it considers it desirable that any license for the project should contain a provision requiring continuous passage of water quality control releases until completion of proposed Grays Landing Lock and Dam downstream on the Monongahela River, and requiring discharge thereafter of water quality control releases from Rowlesburg Reservoir as provided for in Article 32 herein.

We are including Article 35 herein which requires Applicant to submit to the Commission certification of reasonable compliance with applicable water quality standards pursuant to Section 21 (b) of the Water Quality Improvement Act of 1970 (P.L. 91-224).

Cognizant of our obligations under the National Environmental Policy Act of 1969 (83 Stat. 852) we have carefully considered the comments of the interested agencies. In that we do not consider this licensing order a "major Federal action significantly affecting the quality of human environment," we have not sent a detailed statement to the Council on Environmental Quality. However by Article 36 herein, we are providing that Applicant shall consult and cooperate with interested local, State and Federal environmental agencies in the interest of preserving and promoting the environment of the project.

The project is located about 41 miles downstream from the site of the multiple-purpose Rowlesburg Reservoir authorized for construction by the U.S. Corps of Engineers. The Secretary of the Army and the Chief of Engineers have recommended for inclusion in any license for the project special conditions providing that water releases from Applicant's project during flood periods should not exceed flows that would have occurred in the absence of the project and that would insure releases for water quality control below Applicant's project, when the upstream Government multiple-purpose Rowlesburg Reservoir is constructed. The recommended conditions are included herein as Articles 32 and 33. The Corps stated that the interests of navigation would be satisfactorily protected by including in any license for the project the terms and conditions relating to navigation as set forth in attached Form L-3.

The Pennsylvania Fish Commission has advised that its staff has not indicated any reason to object to the granting of a license for the project.

Applicant has filed an Exhibit R which we are herein approving as a part of this license which shows existing recreational use and lands available for future recreational development. Presently developed recreation facilities include privately operated boat docks. Mont Chateau State Park and Coopers Rock State park adjoin the reservoir and provide opportunities for swimming, boating, fishing, hiking and ice skating. Although Applicant has no plans for further development of recreation facilities it has designated certain lands as available for recreation outside the present project boundary which is drawn to follow the maximum pool elevation at 780 msl. By Article 34, herein, we are requiring Applicant to cooperate with State and local agencies in the development and maintenance of recreational facilities necessary for optimum recreational utilization by the public of project lands and waters and to file a revised Exhibit F and revised Exhibit K drawings to reflect the project boundary as including lands owned by the Applicant adjacent to the reservoir designated for recreation use.

The Monongahela River into which the Cheat River flows has been improved for navigation since about 1841, first under charter by the Commonwealth of Pennsylvania and then by the U.S. Corps of Engineers. The existing Federal navigation project on the Monongahela consists of nine locks and dams which provide navigation from Fairmont, West Virginia, located about one mile below the confluence of the Cheat and Monongahela Rivers, downstream to Pittsburg where the Monongahela is joined by the Allegheny River to form the Ohio River. Commercial navigation on the Monongahela consists principally of coal, coke, sand, gravel, iron, steel and petroleum products. Such traffic for 1968 was reported by the U.S. Corps of Engineers as amounting to 40,232,458 tons. The Lake Lynn Hydro Development is located on Cheat River approximately $3\frac{1}{2}$ miles above its mouth in the Monongahela River. During unusually dry seasons there is not sufficient water in the Monongahela River into which the Cheat River flows to provide satisfactorily for lockage for navigation on the Monongahela. The watershed of the Cheat River is an important factor in contributing to the flow of both the Monongahela and the Ohio Rivers. In this connection, the application for license

for the Lake Lynn Project recites that although the project is not designed to aid navigation, 53,500 acre feet of water was released from storage in the Lake Lynn Reservoir (draw-down of 37.65 feet) during the severe drought of 1930 to maintain navigation in the Monongahela River below the mouth of the Cheat River.

Applicant requests a "fair value" license under the provisions of Section 23(a) of the Act. The application states that construction of the project was carried through under War Department approvals (copies of which were included in the application) of July 3, 1912, and August 6, 1913, under the supervision of the U.S. Army Engineers. The approvals were under the Act of March 3, 1899 (30 Stat. 1121) as amended by the Act of June 23, 1910 (36 Stat. 593). The July 3, 1912 approval constituted a 50-year permit which expired on July 2, 1962. It is clear that Applicant is not here seeking a "fair value" license in lieu of a permit; instead, it is seeking a fair value license to succeed the permit. Applicant could have filed a timely application for a "fair value" license in lieu of its permit. Under established Commission policies, if Applicant had sought such a license during the earlier periods of its permit, the Commission could have issued a "fair value" license either for the remainder of the permit term or, as was the case in some early situations, for a longer period. For the reasons set forth in Southern California Edison Company, Project No. 2290 (32 FPC 553; reh. den. 32 FPC 910) the request for a fair value license will be denied; and the license herein granted shall have an effective date of July 3, 1962 (the day following the expiration date of the War Department permit), and a termination date of December 31, 1993.

The Commission finds:

- (1) The project affects navigable waters of the United States.
- (2) Applicant is a corporation organized under the laws of the State of Pennsylvania and has submitted satisfactory evidence of compliance with the requirements of all applicable State laws insofar as necessary to effectuate the purposes

Project No. 2459

- 5 -

of a license for the project.

(3) Public notice of the filing of the application has been given. No protests or petitions to intervene have been received. No conflicting application is before the Commission.

(4) The project does not affect a Government dam, nor will the issuance of a license therefor, as hereinafter provided, affect the development of any water resources for public purposes which should be undertaken by the United States.

(5) Subject to the terms and conditions hereinafter imposed, the project will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce, for the improvement and utilization of water-power development, and for other beneficial public uses, including recreational purposes.

(6) The installed horsepower capacity of the project hereinafter authorized for the purpose of computing the capacity component of the administrative annual charge is 68,300 horsepower, and the amount of annual charges, based on such capacity, to be paid under the license for the project, for the costs of administration of Part I of the Act is reasonable.

(7) The exhibits designated and described in paragraph (B) below conform to the Commission's rules and regulations and should be approved as part of the license for the project.

(8) It is appropriate in carrying out the provisions of the Federal Power Act that the application for a "fair value" license under Section 23(a) of the Act, be denied.

The Commission orders:

(A) This license is hereby issued to West Penn Power Company (Licensee) of Greensburg, Pennsylvania, under Section 4(e)

Project No. 2459

- 6 -

of the Federal Power Act (Act), for a period effective as of July 3, 1962 and terminating December 31, 1993, for the continued operation and maintenance of Lake Lynn Hydro Development, Project No. 2459, located on the Cheat River, in Monongalia County, West Virginia, and Fayette County, Pennsylvania, subject to the terms and conditions of the Act, which is incorporated herein by reference as a part of this license, and subject to such rules and regulations as the Commission has issued or prescribed under the provisions of the Act.

(B) Project No. 2459 consists of:

(i) all lands constituting the project area and enclosed by the project boundary or the licensee's interests in such lands, the limits of which are otherwise defined, the use and occupancy of which are necessary for the purposes of the project; such project area and project boundary being shown and described by certain exhibits which form part of the application for license and which are designated and described as follows:

Exhibit J: (FPC No. 2459-1) entitled, "Lake Lynn P.S. General Map of Project - Lake Lynn, Pa.", signed for West Penn Power Company by Benjamin Bennett, Secretary, on March 31, 1964.

Exhibit K: (FPC Nos. 2459-2 and -3) entitled, "W.Va. Power & Transmission Co., Pittsburgh, Pa. - State Line Development - Key Map of Properties", signed for West Penn Power Company by Benjamin Bennett, Secretary, on March 31, 1964.

Exhibit K: (FPC No. 2459-4) entitled, "West Penn Power Co. - Lake Lynn P.S. - Plot Plan", signed for West Penn Power Company by Benjamin Bennett, Secretary, on March 31, 1964.

Exhibit K: (FPC Nos. 2459-6 through -16) entitled, "Topographic Map of State Line Reservoir", signed for West Penn Power Company by Benjamin Bennett on March 31, 1964.

(ii) a concrete gravity type dam 1,000 feet long with a maximum height of 125 feet; a reservoir at full pool (elevation 870) extends 13 miles upstream with an area of 1,729 acres, and contains 72,300 acre-feet; a 624 foot long spillway controlled by 26 tainter gates, each 17 feet high and 21 feet long with rubber seals; eight penstocks of reinforced concrete, 12 feet by 18 feet, a gatehouse 34 feet by 133 feet by 38 feet; a powerhouse of red brick with steel frame, 72 feet by 156 feet by 68 feet, containing four Francis reaction type turbines each connected to a 16,000 kva generator rated at 0.8 p.f.; four 3-phase transformer banks; and other appurtenant facilities; the location, nature and character of which are more specifically shown and described by the exhibits hereinbefore cited and by certain other exhibits which also form a part of the application for license and which are designated and described as follows:

Exhibit L: (7 sheets)

- (FPC No. 2459-19) Cheat Haven Power Station, Plan and Elevation of Dam.
- (FPC No. 2459-20) Cheat Haven Dam - Cross Section.
- (FPC No. 2459-21) Cheat Haven Dam - Cross Section of Power House.
- (FPC Nos. 2459-22 through -25) Cheat Haven Power Station.

Exhibit M: Two typewritten pages, entitled, "General Description of Equipment", filed in the Commission on April 8, 1964.

Exhibit R:

consisting of:

1. Six typewritten sheets, entitled, "Statement of Utilization for Recreational Purposes", filed with the application.
2. Exhibit R-1 in two typewritten sheets, filed on October 20, 1965.

3. Exhibit R map (FPC No. 2459-28) entitled, "West Penn Power Company - Greensburg, Pa. - Lake Lynn Project - Recreational Utilization".

(iii) all other structures, fixtures, equipment or facilities used or useful in the maintenance and operation of the project and located on the project area, including such portable property as may be used or useful in connection with the project or any part thereof, whether located on or off the project area, if and to the extent that the inclusion of such property as part of the project is approved or acquiesced in by the Commission; also, all riparian or other rights, the use or possession of which is necessary or appropriate in the maintenance or operation of the project.

(C) This license is also subject to the terms and conditions set forth in Form L-3 (Revised September 1, 1968) entitled "Terms and Conditions of License for Constructed Major Project Affecting Navigable Waters of the United States" (40 FPC 1136), which terms and conditions, designated as Articles 1 through 30, are attached hereto and made a part hereof, and subject to the following special conditions set forth herein as additional articles:

Article 31. The licensee shall pay to the United States the following annual charge, effective as of July 3, 1962:

For the purpose of reimbursing the United States for the costs of administration of Part I of the Act, a reasonable annual charge as determined by the Commission in accordance with the provisions of its regulations, in effect from time to time. The authorized installed capacity for such purpose is 68,300 horsepower.

Article 32. The operations of the licensee, so far as they affect the use, storage and discharge of water quality releases from the proposed Rowlesburg Reservoir, shall be

controlled at all times by such reasonable rules and regulations as may be hereafter prescribed by the Commission upon the recommendation of the authorized representative of the Secretary of the Army, in the interest of maintaining these water quality releases for the purpose intended. Licensee shall, upon completion of the proposed Rowlesburg Project, modify operations prior to the time the Grays Landing Dam is operational to pass continuously through Lake Lynn the flows released from the Rowlesburg Project for water quality control. When the Grays Landing Dam is operational, all water released as regular discharge from the Rowlesburg reservoir shall be passed through Lake Lynn within the following 24 hours and at a rate of not less than 2,000 c.f.s.

Article 33. The licensee shall not release from Lake Lynn reservoir, during flood periods, flows that will exceed those which would have occurred in the absence of the project. Project operating procedures to assure compliance with this requirement shall be developed cooperatively by the Licensee and the District Engineer, U.S. Army Engineer District, Pittsburgh.

Article 34. Licensee shall cooperate with State and local agencies in the planning, development, and maintenance of access areas and roads, water control structures, and such other facilities necessary for optimum recreational utilization by the public of project lands and waters consistent with the terms of the license and the operation of the project and shall within 90 days from the date of acceptance of this license, file a revised Exhibit F and revised Exhibit K drawings to include within the project boundary lands owned by Licensee adjacent to the reservoir designated for recreation use.

Article 35. Licensee within one year after date of issuance of this license shall submit to the Commission certification of reasonable compliance with applicable water quality standards pursuant to Section 21(b) of the Water Quality Improvement Act of 1970 (P.L. 91-224).

Article 36. In the interest of preserving and promoting the environment of the project area, Licensee shall consult and cooperate with interested local, State and Federal environmental protection agencies, and the Commission reserves the right, after notice and opportunity for hearing, to require such changes in the project and its operation as may be necessary to preserve and promote the environment of the project area.

Project No. 2459

- 10 -

(D) The exhibits designated and described in paragraph (B) above are hereby approved as part of this license.

(E) The Licensee shall within 90 days from the date of acceptance of this license, file in accordance with the provisions of Section 11.20(a)(4) of the Commission's Regulations a statement under oath showing the gross amount of power generation for the project in kilowatt-hours for each calendar year commencing July 3, 1962.

(F) The Commission reserves the right to determine at a later date what additional transmission facilities, if any, should be included in this license as part of the project.

(G) The application for a "fair value" license under the provisions of Section 23(a) of the Act for Project No. 2459, is hereby denied.

(H) This order shall become final 30 days from the date of its issuance unless application for rehearing shall be filed as provided in Section 313(a) of the Act, and failure to file such an application shall constitute acceptance of this license. In acknowledgment of the acceptance of this license, it shall be signed for the licensee and returned to the Commission within 60 days from the date of issuance of this order.

By the Commission.

(S E A L)

**Kenneth F. Plumb,
Acting Secretary.**

Project No. 2459

- 11 -

IN TESTIMONY of its acknowledgment of acceptance of all of the provisions, terms and conditions of this license WEST PENN POWER COMPANY, this ____ day of _____, 1970, has caused its corporate name to be signed hereto by _____, its _____ President, and its corporate seal to be affixed hereto and attested by _____, its _____ Secretary, pursuant to a resolution of its Board of Directors duly adopted on the ____ day of _____, 1970, a certified copy of the record of which is attached hereto.

WEST PENN POWER COMPANY

By _____
President

Attest:

Secretary

(Executed in quadruplicate)

BRUBER/FARRER/1b/2180

ORDED-P (23 Oct 64) 3rd Ind
 SUBJECT: West Penn Power Company, Project No. 2459

U.S. Army Engineer Division, Ohio River, Cincinnati, Ohio 30 December 1964

TO: Chief of Engineers, ATTN: ENGCV-EP

Forwarded concurring in the views of the District Engineer, subject to the following comments.

a. Any license granted to the applicant should recognize the provisions of the forthcoming report of the Chief of Engineers and the report of the Board of Engineers for Rivers and Harbors, pertaining to the most recent survey report on Cheat River, W. Va., and Pennsylvania.

b. Provisions listed in paragraph 4 of second indorsement should be revised to apply to the period prior to operation of the proposed Rowlesburg Reservoir.

FOR THE DIVISION ENGINEER

JONES

ABBOTT

3 Incl:
 ac

E. E. ABBOTT
 Chief, Engineering Division

ABBOTT

COPY FURNISHED DISTRICT ENGINEER

KNOCW-KP

29 January 1965

Honorable Joseph C. Swidler
 Chairman, Federal Power Commission
 Washington, D. C. 20426

Dear Mr. Swidler:

Reference is made to the Commission's letter dated 21 October 1964 concerning the application for major license filed by West Penn Power Company for constructed hydroelectric Project No. 2459, located on the Cheat River, in West Virginia and Pennsylvania.

The applicant's project is located about 41 miles downstream from the site of the multiple-purpose Rowlesburg Reservoir which is currently under study by the Corps of Engineers in connection with the Cheat River review study. That report is to be submitted to Congress in response to resolutions of the Senate and House Public Works Committees dated 30 April 1958 and 3 June 1959 respectively. The report has been submitted to Federal and State agencies for their comments, receipt of which has been requested by 4 March 1965.

One of the purposes of the proposed Rowlesburg Reservoir would be provision of releases for water quality control below the applicant's project. If and when the Rowlesburg Reservoir project is constructed, accomplishment of this purpose would require that Rowlesburg project water quality releases be passed through the applicant's reservoir in a manner to insure the benefits intended. Accordingly, the license, if issued, should include a provision worded somewhat as follows: "The operations of the licensee, so far as they affect the use, storage and discharge of water quality releases from the proposed Rowlesburg Reservoir, shall be controlled at all times by such reasonable rules and regulations as the authorized representative of the Secretary of the Army may prescribe in the interest of maintaining these water quality releases for the purpose intended." In this connection, the District Engineer's report referenced above includes discussion of water quality control

D-1507-58 Cheat River FPC District Engineer # 2-15-65
 COPY for OHIO RIVER DIVISION

releases from the applicant's project. Also, for your information, Exhibit B, Appendix 1 of the application includes a provision for releases specified as a condition for the original approval of the applicant's dam by the Secretary of War, 12 July 1912.

The license, if issued, should specify that releases from the applicant's project during flood periods should not exceed flows which would have occurred in the absence of the project. Operating procedures to assure compliance with this requirement should be developed in cooperation with the District Engineer, U. S. Army Engineer District, Pittsburgh.

The interests of navigation would be satisfactorily protected by including in the license the terms and conditions relating to navigation as shown in the Commission's Form L-3 (1 August 1964). The plans of the structures affecting navigation are satisfactory.

One copy of the application is returned as requested.

Sincerely yours,

1 Incl
Appli. for Lic.
Project No. 2459

S. W. PINNELL
Lt Colonel, Corps of Engineers
Assistant Director of Civil Works
for Central Divisions

ENICW-EP

9 November 1964

SUBJECT: West Penn Power Company, Project No. 2459

TO: Division Engineer
U. S. Army Engineer Division, Ohio River

1. Referred for:

- Information as basis for further reply, to reach OCE ATTN:
ENG _____ not later than _____.
- Draft of reply.
- Direct reply, copy to OCE.
- Direct reply to OCE by Dist, copy to Div Engr.
- Appropriate Action.
- Information, copy of OCE reply.
- Your information.
-

2. Correspondent has/has not been informed of reference.

FOR THE CHIEF OF ENGINEERS:

Incls
Notice of Appln for Lic
(in dup)S. W. PINNELL
Colonel, Corps of Engineers
Assistant Director of Civil Works
for Central Divisions

____ Cy Div Engr

ENG FL NO. 17, 23 Jan 63

ARRIS/eja/2153

3 2 1

ORDED-T (9 Nov 64) 1st Ind
SUBJECT: West Penn Power Company, Project No. 2459

U.S. Army Engr Div, Ohio River, Cincinnati, Ohio 13 November 1964

TO: District Engineer, ATTN: ORPED-A, U.S. Army Engineer District,
Pittsburgh

1 Incl (sing)
nc (1 cy wd)

E. E. A.

JONES
ABBOTT

UNITED STATES OF AMERICA
FEDERAL POWER COMMISSION

West Penn Power Company

)

Project No. 2459

NOTICE OF APPLICATION FOR LICENSE

(November 6, 1964)

Public notice is hereby given that application has been filed under the Federal Power Act (16 U.S.C. 791a-825r) by West Penn Power Company (correspondence to: Benjamin Bennett, Secretary, West Penn Power Company, Cabin Hill, Greensburg, Pennsylvania) for a license for constructed Project No. 2459, known as the Lake Lynn hydro development, located on Cheat River about $3\frac{1}{2}$ miles upstream from its mouth, in Monongalia County, West Virginia, and in Fayette County, Pennsylvania, $2\frac{1}{2}$ miles southeast of Point Marion.

The Lake Lynn hydro development consists of: (1) a concrete gravity type dam 1,000 feet long with a maximum height of 125 feet; (2) a reservoir at full pool elevation 870 feet extending 13 miles upstream from the dam and having an area of 72,300 acre feet; (3) a 624-foot long spillway controlled by 26 tainter gates, each 17 feet high and 21 feet long with rubber seals; (4) eight penstocks of reinforced concrete, 12 feet by 18 feet; (5) a gate house; (6) a red brick and steel frame powerhouse containing four Francis reaction type turbines each connected to a 16,000 kva generator rated at .8 power factor total installed capacity 51,200 kw; (7) four 3-phase transformer banks; (8) switchyards; and (9) other appurtenant electrical and mechanical equipment.

Protests or petitions to intervene may be filed with the Federal Power Commission, Washington, D. C., 20426, in accordance with the Rules of Practice and Procedure of the Commission (18 CFR 1.8 or 1.10). The last day upon which protests or petitions may be filed is December 21, 1964. The application is on file with the Commission for public inspection.

Joseph H. Cutride
Secretary

W
/ Mr O'K
E
11-9-64

EMDCW-EP

23 October 1964

SUBJECT: West Penn Power Company, Project No. 2459

TO: Division Engineer
U. S. Army Engineer Division, Ohio River

1. Inclosed is a letter from the Federal Power Commission to the Chief of Engineers dated 21 October 1964 concerning an application for a major license filed by the West Penn Power Company for constructed hydroelectric Project No. 2459, located on the Cheat River, in Monongalia County, West Virginia, and Fayette County, Pennsylvania.

2. Your report on this application should be furnished in response to the request in the inclosed letter. The application should be returned with your reply and should reach this office by 4 January 1965. The prints may be retained.

FOR THE CHIEF OF ENGINEERS:

4 Incls

1. Cy of ltr from
FPC to OCE dtd
21 Oct 64 (in dup)
2. Appln
3. Statement dtd
8 Sept 64 (in dup)
4. 27 Prints, FPC Nos.
2459-1 thru 27 (in dup)

S. W. FINNELL
Lt Colonel, Corps of Engineers
Assistant Director of Civil Works
for Central Divisions

67150-58
Cheat River
7 P & Project 2459

KELLER/11/2179 *JK*

ORPED-P (25 Oct 64) 1st Ind
 SUBJECT: West Penn Power Company, Project No. 2459

U.S. Army Engineer Division, Ohio River, Cincinnati, Ohio 4 November 1964

TO: District Engineer, ATTN: ORPED-T, U.S. Army Engineer District,
 Pittsburgh

1. For review and report on the subject application.
2. The application should be returned with your reply and should reach this office by 15 December 1964.

FOR THE DIVISION ENGINEER:

JONES *Jones*

FARRER *Farr*

ABBOTT

4 Incls:

1. cy wd (sing)
2. nc
3. cy wd (sing)
4. cy wd (sing)

~~S. S. ABBOTT~~
 Chief, Engineering Division

ORPED-A (2J Oct 64) 2d Ind MR. Barfoot/amr/6829
 SUBJECT: West Penn Power Company, Project No. 2459

U. S. Army Engineer District, Pittsburgh, 11 December 1964

TO: Division Engineer, U. S. Army Engr. Div., Ohio River, ATTN: ORPED-P

1. It is suggested that at the time a reply to the Federal Power Commission's letter of 21 October 1964 is prepared, they be apprised of the current status of the Rowlesburg Reservoir report. Coordination for the report was done through the Federal Power Commission, New York Regional Office and the Washington, D. C. office may not be fully aware of the aspects of the proposed Rowlesburg project.

2. It is recommended that the license for the constructed hydroelectric Project No. 2459, located on the Cheat River in Monongalia County, West Virginia, and Fayette County, Pennsylvania, if granted, include the condition that the licensee be required to regulate and coordinate with the Secretary of the Army reservoir releases for the purpose of passing water quality control discharges from the proposed Rowlesburg Reservoir Project. The operations of the licensee, so far as they affect the use, storage and discharge of water quality releases from the proposed Rowlesburg Reservoir, shall be controlled at all times by such reasonable rules and regulations as the Secretary of the Army may prescribe in the interest of maintaining these water quality releases for the purpose intended. The Rowlesburg Reservoir Report of December 1963 on the subject of water quality control releases at Lake Lynn Power Station states, ". . . that a minimum discharge of 300 c.f.s. be maintained between Lake Lynn Power Station and the Monongahela River when Monongahela River flow is less than 1,000 c.f.s. This would require the power station to release 300 c.f.s. during times when power is not being produced and the Monongahela River flow is less than 1,000 c.f.s. In addition, to meet water quality requirements the Lake Lynn Power Station would be required to pass each day the inflow of that day which would be scheduled by operations of Rowlesburg Reservoir for water quality control in the Monongahela River".

3. It is recommended that the license, if granted, provide for payment by the licensee to the United States for the headwater benefit to be obtained should the proposed Rowlesburg Reservoir Project be constructed.

4. It is recommended that the license, if granted, include the following provisions which were included in the original permit dated 12 July 1912, as amended herein to reflect conditions if the proposed Rowlesburg Reservoir is not constructed:

ORPKD-A (23 Oct 64)

2d Ind

11 December 1964

SUBJECT: West Pann Power Company, Project No. 2459

a. That the West Pann Power Company or its successors, shall construct, maintain, and operate in connection with said dam, without expense to the United States, such lock or locks, booms, sluices, or other structures as the Chief of Engineers, Secretary of the Army, or Congress, may at any time hereafter deem necessary and require in the interest of navigation;

b. That should Congress, hereafter, make provisions for the construction of a lock, or other structures, for navigation purposes, in connection with the said dam, the said company, or its successors, shall convey to the United States, free of cost, a tract of land (not less than five acres), sufficient for such construction and approaches, and the said company, or its successors, shall furnish to the United States, free of cost, such water power as may be required for building and operating such constructions;

c. That, in the event the proposed Howlesburg Reservoir is not constructed, when required by the Secretary of the Army, the plant shall be so operated that the minimum daily discharge shall not be less than the equivalent of 100 cubic feet per second, and the minimum weekly discharge not less than the equivalent of 150 cubic feet per second; and

d. That the Secretary of the Army may require at any time such changes in methods of operation of the plant as he may deem necessary in the interest of navigation.

3. The project plans have been examined and are satisfactory to this office.

8 Incl
wd incl 4

J. E. HAMMER
Colonel, Corps of Engineers
District Engineer



DEPARTMENT OF THE ARMY
PITTSBURGH DISTRICT, CORPS OF ENGINEERS
WILLIAM S. MOORHEAD FEDERAL BUILDING
1000 LIBERTY AVENUE, PITTSBURGH, PA 15222-4186

January 28, 1986

Honorable Arlen Specter
United States Senate
331 Hart Senate Office Building
Washington, D.C. 20510

Dear Senator Specter:

In response to your oral request to Colonel Rothblum at the December 31, 1985 meeting in Charleroi, PA, concerning the November 1985 flood in the Monongahela Basin, the Pittsburgh District, Corps of Engineers and representatives of West Penn Power Company met on January 7, 1986 and January 23, 1986 and discussed the merits of installing a trash boom at the Lake Lynn Dam.

Three basic aspects were covered in our meetings: (1) the effects of not having a boom during the recent record flood (November 4-6, 1985); (2) the feasibility of installing a boom; and, (3) the benefits of a trash boom in the future. The following conclusions were formulated and are discussed in like numerical sequence below:

(1) A trash boom would extend across the lake, and would theoretically minimize floating debris from reaching the dam. While a significant amount of debris collected on and behind the dam during the flood, it did not prevent the spillway gates from being opened (which is necessary to prevent overtopping of the dam), nor did it in any way infringe upon the structural integrity of the dam. Our consensus is that the peak discharge from the dam may have been slightly reduced and delayed by some hung-up debris which partially interfered with spillway flow. However, this probably had an insignificant effect, if any, on the level of flooding downstream.

The reservoir pool crested about 6.5 feet above its normal maximum level of elevation 870.0 mean sea level (msl). Normal procedure would have been to begin closing the gates as soon as the pool receded to about the 870.0 msl level. However, debris became lodged in the gate openings, and this prevented them from being closed until several days later. During this time the pool fell to about elevation 855 msl. This condition did have a minimal effect beginning several hours after the crest downstream of holding flows and stages slightly above what they would otherwise have been during the remainder of the flood recession.

(2) The feasibility of installing a boom in the future was discussed. We have reservations as to the possible consequences in the event that a trash boom, fully loaded, might break loose and suddenly strike the dam during a

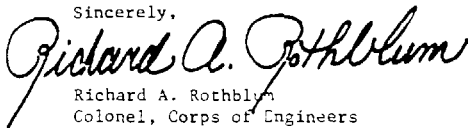
major flood. Besides placing an additional load on the dam, such an occurrence could result in more severe jamming of, as well as damage to, the gates than if a boom had not existed. A simple boom of floating timbers such as the Corps of Engineers employs at its reservoirs would not be adequate at Lake Lynn for this type of flood event. Due to the large volume of trash, higher velocities, and possible consequences of failure a much more elaborate and costly structure would be required.

(3) The future benefits of a trash boom to the general public, while not significant for flood reduction, would include collection of upstream debris, much of which now passes through to downstream rivers for further handling. For example, the Corps of Engineers' problem of debris accumulation in lock approaches at its navigation dams would be lessened. However, the possible benefits to the public in collection of nuisance trash may be outweighed by the additional expense and the potential liability of such an installation. The Company and its customers would incur additional costs in constructing and maintaining the boom as well as retrieving and disposing of the debris. Additionally, the trash boom would reduce the amount of open water available for recreation at Lake Lynn.

It is recognized that floating debris creates problems of varying degree on most major rivers. Recreational boaters, commercial navigation interests, government facilities and private dam operators (recent article in "Hydro Review" on Susquehanna River, p. 77, Winter 1985, copy attached) are among those affected. The issues of costs of removal versus benefits and how these costs can be assigned to actual polluters, trash collectors, or beneficiaries of the removal have been debated but not resolved.

In summary, the recent flooding was not aggravated by the absence of a trash boom at Lake Lynn and such a boom would not be significant for flood reduction in the future.

Sincerely,



Richard A. Rothblum
Colonel, Corps of Engineers
District Engineer



Robert A. Mvcoff
Executive Director, Operating
Allegheny Power System
for West Penn Power Company

Enclosure

Copies furnished:

Honorable Arlen Specter
U.S. Senator
2017 William S. Moorhead Federal Bldg.
Pittsburgh, PA 15222

U.S. Army, Corps of Engineers
Washington, D.C. 20314-1000
ATTN: DAEN-CWE-H)

U.S. Army, Corps of Engineers
Ohio River Division, Cincinnati, OH 45201-1159
ATTN: ORDED

FERC
ATTN: Mr. Ron Corso
400 1st St., N.W.
Room 108
Washington, D.C. 20001

Mr. MURPHY. Would you ask him what obligation the corps may have in notification of counties, communities, et cetera? Could the General address that.

General OFFRINGA. I would be happy to, sir.

The responsibility for notification in flood emergencies lies with the National Weather Service.

We participate on a cooperative basis with them in providing all of the readings that we make at our various gauges and levels of the rivers in order to assist them in their analysis of data and their forecasting. This is in addition to all the other sources that they use. But in order to have one voice speaking when warning comes, so you don't have warnings coming from different agencies, the Weather Service has been designated as the sole responsible agency.

Mr. MURPHY. Who do they notify? Do they notify you?

General OFFRINGA. We are within their net.

Mr. MURPHY. You are within their net. Where do they notify you?

General OFFRINGA. Well, we get it, some of it, from their computers because we are tied into the same satellite and computer system, and we get it from telephone notification and also off the weather teletype.

Mr. MURPHY. Do you pass the word on to anyone?

General OFFRINGA. We disseminate it within our corps channels.

Mr. MURPHY. Only within the corps?

General OFFRINGA. Only within the corps.

Mr. MURPHY. You don't notify communities or have no responsibility for that?

General OFFRINGA. We don't do that.

Mr. MURPHY. Can you expand that service to the people or do you need to be commanded to do that?

Mr. ROE. In the Snake River basin somebody said we may not have suffered through—I think you said—similar situations. One thing we have invoked since then is much more intricate advanced warning program locked into each community so that each community knows exactly what the situation is, and each is coordinated. So that certainly can be considered, and I think you have recommended that that can be considered, in the earliest possible moments. I think that could be done because what you are saying basically is that people have at least some advanced notice or have the maximum advanced warning so they can prepare for it, if nothing else.

Mr. MURPHY. Yes, that is what we need.

Mr. ROE. I think so.

Any other questions?

We want to thank you very much, and your colleagues, for your initial presentation, and please stand by in case some other questions come up.

The next panel is the Federal Energy Regulatory Commission: Mr. Ronald A. Corso, Director of the Division of Inspection, Office of Hydropower Licensing, accompanied by Mr. Don Garber, Deputy Director, Office of Hydropower Licensing.

TESTIMONY OF RONALD A. CORSO, DIRECTOR, DIVISION OF INSPECTIONS, OFFICE OF HYDROPOWER LICENSING, FEDERAL ENERGY REGULATORY COMMISSION; ACCOMPANIED BY DON GARBER, DEPUTY DIRECTOR, OFFICE OF HYDROPOWER LICENSING, AND PAMELA W. SIMPSON, HOUSE LIAISON; AND ALDO T. ANGELO, SUPERVISORY HYDROLOGIST, NATIONAL WEATHER SERVICE, PITTSBURGH, PA

Mr. CORSO. Mr. Chairman and members of the Subcommittee on Water Resources, I appreciate the opportunity to appear before you today on behalf of the Federal Energy Regulatory Commission, or FERC, to testify on the devastating flood that occurred on the Monongahela River and Cheat River in early November 1985. My position with FERC is Director, Division of Inspections, Office of Hydropower Licensing. I am responsible for supervising the Commission's dam safety program and post-license administration, which includes ensuring the licensees properly construct, operate, and maintain licensed projects. My testimony reflects the views of the staff of the Division of Inspections, Office of Hydropower Licensing.

Also attending from the Commission are Ms. Pamela W. Simpson, House liaison, and Mr. Don Garber, Deputy Director, Office of Hydropower Licensing.

Pursuant to its authority under the Federal Power Act, the FERC licenses non-Federal hydroelectric projects. Therefore, the Commission has jurisdiction over the Lake Lynn project. The license for the Lake Lynn project was issued in 1970.

In view of the committee's inquiry and pursuant to the Commission's regulations, the staff of the Division of Inspections has conducted its own independent investigation. We have reviewed hydrologic data and the project operation by the licensee during the flood event of November 4 and 5, 1985. Our review found that operation of the project was consistent with the license. We have also independently confirmed that the licensee did issue advance flood warnings in accordance with the procedures outlined in the Emergency Action Plan required by the Commission's regulations.

In evaluating the operation of Lake Lynn Dam during this unusual flood event, it is important to note that the project was constructed for the primary purpose of generating hydroelectric power and that Lake Lynn has no storage capacity for flood control. Our review of the licensee's operation of the project powerhouse on November 4 and 5, 1985, to lower the reservoir and the subsequent operation of the spillway gates on November 4 and 5, 1985, indicates that the project did not have any significant effect on the peak flood flows that occurred downstream on the Monongahela River and Cheat River.

The spillway gates were gradually opened to pass the extreme flood flows that entered the reservoir. The unprecedented magnitude of the flood also created a large amount of debris that was trapped by the dam. While the debris did cause clogging of the spillway gates, our analysis indicates that this had no significant effect on the peak flows downstream of the project.

We also reviewed the licensee's procedures in implementing the emergency action plan required by the Commission's regulations. We contacted the Corps of Engineers and officials of Fayette and Greene Counties. All parties indicated that the licensee provided adequate notification and maintained communication throughout the flood event.

The license for the Lake Lynn project includes article 33, in the license pursuant to a recommendation by the Corps of Engineers at the time of licensing. Article 33 requires that the project be operated so as not to cause a flood peak greater than would have occurred in the absence of the project. Our review indicates that the licensee complied with the license requirement.

In conclusion, our review indicates that the licensee complied with the license for the Lake Lynn project and the Commission's regulations.

This concludes the summary of my testimony. I will be glad to answer any questions.

Mr. ROE. Mr. Garber, have you anything to add?

Mr. GARBER. No sir, I do not.

Mr. ROE. How about Mr. Angelo?

Mr. ANGELO. I have a summary. Would you like to hear it?

Mr. ROE. Yes.

Mr. ANGELO. Mr. Chairman and members of the subcommittee, I appreciate this opportunity to provide information on the flood of November 4 to 6, 1985 in the Monongahela River basin. I am going to give some details on weather factors, flood magnitude, the flood warnings and suggested improvements related to this event.

First, I am going to describe the weather situation prior to the flood event. I have provided you a map of the United States depict-

ing the major atmospheric features (figure 1). On the surface, an easterly moving surface trough, combined with a low pressure center originating off the South Carolina coast formed an intense low pressure center in the Tennessee Valley. This system caused record rainfalls and devastating flooding in the Mid-Atlantic States of West Virginia, Virginia, Pennsylvania, and Maryland.

On the morning of November 3 a weak surface low (1,006 mbs) was located in the gulf coast of Florida with a trough extending northward into the Great Lakes. At upper levels a 500 millibar trough was located about 350 miles west of the surface trough. During the next 24 hours, the surface low moved northeastward to South Carolina (figure 2) and began intensifying.

Portions of the southern Appalachians received rainfall in excess of 10 inches during the first 5 days of November 1985, with one location, Montebello, VA, reporting over 18 inches in this period. Most of the rainfall occurred on November 3 and 4 with 4- to 8-inch amounts common in many locations in the Appalachians.

I have furnished a map showing the Monongahela River basin, the storm rainfall amounts over the basin, and the area we are most concerned with, the Cheat River basin. I will point out the geographic features as I go along.

The maximum 24-hour total of 6.82 inches of precipitation was reported at Pickens, WV, at 0700 eastern standard time on the 5th. Pickens is located in the headwaters of the Tygart River above Tygart Dam. The maximum recorded 24 hour amount of rainfall in the Cheat River basin was 5.20 inches at Bemis, WV.

The storm center of maximum rainfall occurred to the east of the Cheat River basin in the Potomac drainage basin. Thus, it appears that the rainfall on the ridges bordering the eastern part of the Cheat basin was substantially higher than elsewhere in the basin, although we have no reports to confirm this. Elsewhere, over the upper Monongahela River, 24-hour rainfall amounts ranged from 4 to 8 inches.

The very heavy rainfall caused the rivers and streams to rise at unprecedented rates along the Cheat, Tygart and West Fork Rivers. Rainfall amounts that occurred during this storm are more commonly associated with summer type thunderstorms. The surface, during the summer months is covered with vegetation and absorption rates are high. During the winter months, a heavy snowpack would have slowed down the runoff. However, in this case, with the surface stripped of vegetation and snow cover, the runoff was extremely rapid.

Early on November 5 river rises exceeding 2 feet an hour occurred on the Monongahela River at many locations, including Point Marion. Figure 4 shows the observed river stages for selected stations along the West Fork, Cheat and the Monongahela Rivers. I would like to call your attention to the information on lock 8, Point Marion, PA, Parsons, WV, and the Lake Lynn Power Dam. Along the headwater streams, including the Cheat, West Fork and Tygart Rivers, the rates of rise were much higher.

Parsons, WV is the farthest point upstream for which the National Weather Service receives meaningful stage data. Lake Lynn Power Dam is the next point downstream, and Point Marion is the last point for which the National Weather Service receives data on

the Cheat River. Note that many stage observations are missing, signified by the letter M on figure 4. The observations were missed because the gauges became inaccessible due to the severity of the flooding.

You can see that there is very little information on the river stage at Parsons, WV, above Lake Lynn Dam. The crest at lock 8, Point Marion, was 44.4 feet, which occurred at 3:45 p.m. on November 5 according to a report we received from the Corps of Engineers. This crest was 18 feet above flood stage and almost 11 feet higher than the previous flood of record.

As a matter of fact, the flood of November 4-7, 1985, exceeded all previous flood records at nearly all locations on the rivers and streams above lock 4, Charleroi, PA. Figure 5 shows this comparison.

The National Weather Service issues flood warnings whenever they determine that river rises will exceed the flood stage at established forecast points. Flood stage is defined as the river stage at which damage begins to occur.

The National Weather Service released the first flood warning for Point Marion at 8:40 p.m., November 4. Flooding began around 2 a.m. on the 5th, and the crest occurred at 3:45 p.m. on the 5th. The National Weather Service periodically updated the Monongahela River forecasts as rainfall and river stage data became available. All gauges along the Cheat River were destroyed by the water early in the flood period. Point Marion became the first river station where the flow of the Cheat River could be determined.

National Weather Service flood warnings are issued through various public and private agencies. The accompanying figures 6 and 7 show the flow of information in river forecasting and warning.

Flood warnings are disseminated through local news media, including radio, TV, and newspaper. National Weather Service river forecasters provide a great deal of river and flooding information to the public by telephone to radio stations. Often information is provided through on the air interviews on radio and TV.

The fast responding rivers experienced in this particular flood required a rapid dissemination procedure to insure that warnings were received in time for adequate response. NOAA Weather Radio, broadcasting from the National Weather Service office in Pittsburgh, carried the latest flood and severe weather warnings directly to the public, emergency management officials, and other media. The telephone call-up lists, and telephone warning trees also are effective devices for disseminating warnings.

The interagency hazard mitigation report, FEMA-754-DR for Pennsylvania, concluded that a breakdown of warnings occurred with local dissemination of data. This is beyond the scope of current National Weather Service dissemination systems.

The heavy rainfall, during a normally dry time of the year when soil conditions are conducive to high runoff rates, was the cause of this natural disaster. Funds added by Congress to NOAA's fiscal year 1986 appropriation for the Integrated Flood Warning System Program will provide upgraded local flood warning systems in the counties hardest hit by these floods. The \$3 million add-on will help purchase and install rainfall or streamflow gauges and provide communications and data processing equipment. The States

and localities will then pay the costs of operating and maintaining the systems.

The best flood forecast is useless if the public cannot interpret it. Flood awareness programs, initiated at local levels by Federal and State emergency management personnel, would be much more effective than those conducted by the National Weather Service. This is because the specific needs of each community could be incorporated into an appropriate response procedure.

Posting various flood high water marks with gauge heights relating to the official flood forecast gauges would help the local citizenry understand the impact of the various river stage forecasts. Victims of past floods should label high water marks with appropriate river crests relating to the nearest official flood forecast gauge.

Thank you for the opportunity to discuss the river and flood forecasting program of the National Weather Service. I will be happy to answer the committee's questions concerning the events of November 3-6, 1985.

Mr. ROE. Yes, sir.

Mr. MURPHY. Thank you, Mr. Chairman.

I will ask Mr. Corso the first question. The Federal Management Agency, immediately after the flood, their reports recommended that the emergency operations procedures at the dam, at Lake Lynn, be monitored and improved, that existing emergency operations procedures be exercised and that the dam operations be tied into an overall flood basin preparedness program.

Can you comment on their findings or were you made aware of their findings in December?

Mr. CORSO. Yes sir, Congressman Murphy. I believe you are referring to a report that FEMA issued recently which alluded to the emergency action planning surrounding this event. All licensed projects of the FERC are required to have an emergency action plan and Lake Lynn is one of those projects that does have an emergency action plan. Under such plans, they are required to notify the officials of local emergency preparedness agencies who have the authority and the ability to warn people at the local level, and evacuate if necessary. Our information, in checking it with the counties particularly, indicates that the Commission's requirement for an emergency action plan was implemented by the power company.

We were not involved in that particular report and we have suggested to FEMA that it might be well for the FERC to be a participant in the preparation of such reports in the future.

Mr. MURPHY. Who makes up such a plan as that?

Mr. CORSO. We have specific regulations and guidelines that instruct the owner of the dam on the preparation of the plan. It is the owner's responsibility to prepare the plan, submit it to the Commission and it is approved. If approved, then they can implement it. If there is some problem with it, we require the changes necessary to make it workable.

Mr. MURPHY. Their plan has not been updated or approved since 1970 when you issued the license?

Mr. CORSO. No. I should mention that all emergency action plans are required to be updated annually. It is updated on a current basis.

Mr. MURPHY. Were you satisfied with the data that the power company gave you that they had sufficiently notified the county emergency units involved?

Mr. CORSO. Well, we went one step beyond that. We actually contacted the officials in the counties and they indicated that they were appropriately notified.

Mr. MURPHY. Can you give us the date that Greene County was notified, the date and time?

Mr. CORSO. Yes, sir.

Mr. MURPHY. To whom?

Mr. CORSO. The Greene County Emergency Management Agency was contacted. A Mr. Mellers is the person responsible, in charge, and a Mr. Long is the person second in charge. Mr. Mellers was unavailable but the company was able to get in touch with Mr. Long.

Mr. MURPHY. You notified Mr. Long then?

Mr. CORSO. They notified him before they began opening the gates that there was going to be a significant rise in the flood stage downstream.

Mr. MURPHY. You don't know the exact time or the date?

Mr. CORSO. I can get that for you. I don't have it right here at hand at the moment.

Mr. MURPHY. I would appreciate it if you would give us the exact time and date and to whom the notice was given.

Mr. CORSO. OK.

Mr. MURPHY. As well for Fayette County. Do you have that?

Mr. CORSO. Yes sir. They also contacted Fayette County similarly—the Emergency Preparedness Agency, and notified them before opening the gates, and we can provide the exact times if you wish.

Mr. MURPHY. You will provide to the committee the exact time and persons who were supposed to have been notified?

Mr. CORSO. Yes, sir.

[The following was received from Mr. Corso:]

GAI CONSULTANTS, INC.

Table 2

LAKE LYNN DAM
FEDERAL ENERGY REGULATORY COMMISSION WARNING
AND EVACUATION PLAN
NOTIFICATIONS GIVEN UNDER PLAN
NOVEMBER 4 THROUGH 10, 1985^(1, 2)

First Stage Alert

Fayette County Emergency Management Agency. At 2217 hours on November 4, Mr. Lance Winterhalter was called. Winterhalter was not in at the time but returned the call at 2233 hours on November 4.

Greene County Emergency Management Agency. At 2219 hours on November 4, Sergeant Mitchell (Greene County Jail) was notified.

Second Stage Alert

Fayette County Emergency Management Agency. At 2323 hours on November 4, Mrs. Winterhalter was notified.

Greene County Emergency Management Agency. At 2326 hours on November 4, Herb McCabe was notified (Greene County Jail).

Third Stage Alert

Fayette County Emergency Management Agency. At 0035 hours on November 5, Mr. Winterhalter was notified.

Greene County Emergency Management Agency. At 0044 hours on November 5, the Green County Jail was notified.

Federal Energy Regulatory Commission. At 0053 hours on November 5, Mr. Anton Sidoti was notified.

Fourth Stage Alert

Fayette County Emergency Management Agency. At 0204 hours on November 5, Mr. Mellors was notified.

Greene County Emergency Management Agency. At 0205 hours on November 5, Mr. Yoders was notified.

Federal Energy Regulatory Commission. At 0208 hours on November 5, Mr. Sidoti was notified.

GAI CONSULTANTS, INC.
Table 2 (continued)

Downgrade to Third Stage Alert

Fayette County Emergency Management Agency. At 1344 hours on November 7, Ms. Debbie Sharon was notified.

Greene County Emergency Agency. At 1345 hours on November 7, Mr. Wayne Long was notified.

Federal Energy Regulatory Commission. (Regional Engineer)
At 1348 on November 7, Ms. Rebecca Debes was notified.

Downgrade to Second Stage Alert

Fayette County Emergency Management Agency. At 2000 hours on November 7, there was no answer.

Greene County Emergency Management Agency. At 2000 hours on November 7, Mr. Yoders was notified.

Downgrade to Normal

Fayette County Emergency Management Agency. At 1425 hours on November 10, there was no answer.

Fayette County Emergency Management Agency. At 0805 hours on November 12, Naomi (no last name given) was notified.

Greene County Emergency Management Agency. At 1425 hours on November 10, Mr. Broch was notified.

- (1) This information was provided to GAI by West Penn Power Company personnel.
- (2) This information was taken by West Penn Power Company personnel from logs and tapes from the West Penn Power Transmission and Distribution Center.

Mr. MURPHY. Why wasn't anyone in Washington County notified?

Mr. CORSO. They are further downstream and not within the emergency action plan of the Lake Lynn project per se.

Mr. MURPHY. Are they notified?

Mr. CORSO. Well, we are reviewing the emergency action plan in view of this flood event and to the extent that improvements are necessary. We will require the company to do so.

Mr. MURPHY. Well, I would think that you would want to do that. Washington County commences not too far down the river, not down below lock 7.

Mr. CORSO. Yes sir, I know that.

Mr. MURPHY. Certainly before you hit Maxwell. So I would certainly urge you to insist that the power company amend their plan to notify the officials in Washington County as well.

Mr. CORSO. Generally, the emergency action plans are structured to warn people in the immediate area, because there are other structures further downstream. As it progresses downstream, the responsibility progresses downstream. We will certainly look at that, as you requested.

Mr. MURPHY. Were you made aware that the people at Lake Lynn—did they contact the Corps of Engineers or not, or do you verify that or find out whether they did or not?

Mr. CORSO. Yes, they did contact the Corps of Engineers also, and were in constant communication throughout the event.

Mr. MURPHY. Do you know where and who in the corps?

Mr. CORSO. They were in communication with the Pittsburgh district.

Mr. MURPHY. Pittsburgh district is a lot of area.

Mr. CORSO. Well, I don't know the name of the persons specifically, but we have it in our files right at the moment. We can provide that for the record.

Mr. MURPHY. Would you let us know that as well?

Mr. CORSO. Yes, sir.

Mr. MURPHY. Thank you.

[The following was received from Mr. Corso:]

Regarding notification of the Corps of Engineers, West Penn Power Company notified operating personnel at Lock and Dam No. 7 at 5:16 p.m. and 7:14 p.m. on November 4, 1985, and kept in contact thereafter through November 5, 1985.

Mr. ROE. Mr. Clinger.

Mr. CLINGER. Thank you, Mr. Chairman.

Mr. CORSO, you have indicated that you are undergoing a review of the emergency management plan for the licensee. First, as I understand it, that plan is updated every year?

Mr. CORSO. Yes, sir.

Mr. CLINGER. How long does the license review take, the entire license review?

Mr. CORSO. Well, this particular license I believe expires in 1993, so that would be the next review period.

Mr. CLINGER. Have you reached any preliminary conclusions as a result of what occurred here November 4 for changes in that emergency management plan, or is it premature?

Mr. CORSO. I think it is premature right now. It is our normal procedure to review any emergency action plan after an event as devastating as this one, to see if there are improvements that can be made and that will be done in a very short term.

Mr. CLINGER. Mr. Angelo, you testified concerning your notification or warning of local citizens, and that you were tied in directly with radio stations and television in the area. Is it mandatory for those radio stations and television stations to provide this service or is it on a voluntary basis?

Mr. ANGELO. It is mandatory. It is a condition of their licensing, and they are required to issue any warnings. Anything we send out over the wires that indicates it is a warning or a bulletin of some nature, they are required to broadcast immediately. They don't always do it, but they are required to.

Mr. CLINGER. That was my next question. Did you feel that there was satisfactory publication of this notice after your alert?

Mr. ANGELO. No. We felt that they could have done a better job. We had a number of complaints from citizens along the Monongahela River that did not receive the warnings that we had issued and we are presently in some type of negotiations with the local TV, particularly the TV people, working on some better way to display the flood warnings as we issue them. We haven't done anything concrete yet but we are looking into that.

Mr. CLINGER. But you say it is a part of their licensing that they are obliged to carry these warnings?

Mr. ANGELO. Yes, it is a responsibility they have to do that.

Mr. CLINGER. And what kind of leverage do you have to insure that they do that?

Mr. ANGELO. We have no leverage at all. They can be denied a license if they don't do it. That is the only thing that we can do, we can appeal to—and of course, we don't have the power to do that—that is up to the FCC.

Mr. CLINGER. The timing of this particular notification was what you notified the media at what time and at what time did the—

Mr. ANGELO. I know what time we notified them, I don't know what time they broadcast it. I don't know what the lag time was between the issuance, between our issuance and of the issuance that was made by the TV station. We don't keep records of that.

Mr. CLINGER. Well, at what time did you send out a notification?

Mr. ANGELO. We sent out the first notice—I have it here—as I recall the evening of the 4th we began to put out flood warnings, but the first one that we sent listing, indicating that we would have a flood at Point Marion is in this testimony here. It is in the testimony, sir.

Mr. CLINGER. Did you issue a flood watch before the warning?

Mr. ANGELO. Yes, we had flood watches out earlier that evening. Actually, on the afternoon of the 4th we issued our first flood warnings for southwestern Pennsylvania and then after the rain fell, we had some indication we were having heavy rain in the upper reaches, we began to issue specific flood forecasts for the points along the river for which we are responsible, and we put the first ones out on the evening of the 4th. I believe if I recall correctly about 8:40 that evening we had our first flood warnings to the four specific points along the Monongahela River above Lake Lynn.

Mr. WISE. The flood watches you put out to Pennsylvania would also apply to West Virginia, wouldn't they?

Mr. ANGELO. No, our office in Pittsburgh has warning responsibility only for the State, only for the area in Pennsylvania. The Charleston, WV Weather Service Office would issue flood warnings for West Virginia.

Mr. WISE. Would that be the office providing flood warnings though for the northern part of West Virginia, including the area in Rowlesburg and so on?

Mr. ANGELO. Yes sir, that is correct.

Mr. WISE. But I assume you all were in communication?

Mr. ANGELO. We had provided them with the actual flood forecasts for that area, and we are the National Weather Service Forecast Center and we are responsible for making the forecasts for the northern part of West Virginia, which includes the Upper Monongahela River, and we send them to Charleston and they have the responsibility to issue the warning to the local public.

Mr. WISE. Now, as I look at your flow chart, are you the agency that actually supplies the Corps of Engineers with the information about what is coming?

Mr. ANGELO. Yes sir, we provide the corps with the flood forecasts all the points that we provide other people. We have a direct network with the corps, telephone network. Everytime we make a flood forecast for any part of Pennsylvania, any part of our warning area responsibility, we immediately call the corps and pass that information to them.

If I am sitting in Point Marion or sitting in Rowlesburg or whatever, whom should I be calling if I am concerned. Do I call you or call the corps?

Mr. ANGELO. You would call us if you wanted any information on flooding. We issue that to the corps for their own internal use so they would know. They would use that hopefully to control their flood-control dams and et cetera.

Mr. WISE. Thank you very much.

Mr. MURPHY. Mr. Chairman.

Mr. ROE. I have listened intently to your presentation. I think you have done a good job, but it seems to me that we have a situation existing—at least from what I have heard, I think Mr. Angelo began to touch upon that in his testimony—that the coordination is fine provided the operation is successful, but the patient died. It has got to get to the people so the people have the proper coordinated warning. That would be No. 1, it seems to me.

The second thing it seems to me is the manipulation, if you like, that has been part of the earlier testimony with the corps and other folks involved, of the different structures, and what is to be done to be coordinated in some way. That ought to be responded to because it is not necessarily the amount of rainfall, it is what actions took place during the rainfall that helped to mitigate part of the problem.

So how well is it coordinated. I am curious. It seems to me that that input ought to go to some place in the State area or river basin area where the people have got the whole picture. They are getting some response from, at least as I understand your testimony from you, they are getting some response from Mr. Corso, vis-a-

vis his responsibilities as far as the Lynn Dam is concerned. That filtered back into the Corps of Engineers to make some kind of dissertation or whatever action they were to take to be helpful in lowering the pool or whatever. How does that get coordinated, the impact of that, or does it? That is my concern.

Mr. ANGELO. Let's start from our standpoint. We collect river and weather information, particularly precipitation observations, from a number of observers that we have in the field and a number of those people are at Corps of Engineers locks and dams. We monitor the weather situation and with that we try to anticipate whether we are going to have a problem anywhere.

When we determine that we are going to have a flood at a particular point, we issue a flood warning. We send that through the local media and it goes to the TV stations, radio stations, all the people that we have connected with through the electronic media. Now it is up to the people in the local communities, particularly—

Mr. ROE. What you are coming back and saying is that—again I am not being critical, we are trying to unfold the process here to see whether there is corrections or whatever can be made. What you are saying—correct me if I am wrong—is that your function as you are gathering the data, it goes to the media to disseminate that information, is that correct?

Mr. ANGELO. That is correct.

Mr. ROE. Now, the question, Is there any other mechanism or institutional mechanism that gets to, a particular police department; in a given community, the health community; is there a flood group in a particular town; does it get to those people so it can be disseminated for somebody who doesn't look at television?

Mr. ANGELO. Part of the network is tied to the emergency planning director of each county. He gets that information. It is then his responsibility to work an action plan to get that information down to the local levels where the people are, to take a responsive action.

Mr. ROE. Let me ask the next question. Who establishes the local plans? Part of our problem is that we haven't had the facilities regrettably to be able to do that. So if you will forgive me, what I am trying to get at is that, without being critical, just to unfold this situation. You notify the media, then you came back and said well, the next step is that there is a local county officer or at least some agency that you notify there. How often is that updated? You don't have a flood like this every week. Is that a dynamic situation, or somebody just appointed by the county and says that is your job if it happens. How does that work? Who coordinates that?

Mr. ANGELO. Well, I am not sure I know how it works at the local levels. I know that each community has its emergency planning director, each one has to have it. He must have an action plan on a countywide bases.

Mr. ROE. Who approves the action plan, who establishes it?

Mr. ANGELO. He establishes it. That is his responsibility as part of his job. He has no accountability.

Mr. ROE. Again, how is the local county person assigned who does that? The commissioners, the board of freeholders?

Mr. ANGELO. It is a political appointment by the county commission.

Mr. ROE. Governing body?

Mr. ANGELO. Yes, sir.

Mr. ROE. From your knowledge?

Mr. ANGELO. That is right. I am not sure who does it. A governing body that appoints—

Mr. ROE. Do they update that information to you so you know who to contact? That is what I am trying to get at.

Mr. ANGELO. We have a direct line that goes into their office.

Mr. ROE. Let me try again. I have served at every level of government, including mayor of my community. I know what some of these problems can be. I am coming back and saying there is a process in the State of Pennsylvania and West Virginia that establishes these local contact points and is there somebody that coordinates that locally? What good is the Federal information if it is not put into the process where the people can benefit from it. Who checks the whole thing is what I am trying to get at.

Mr. ANGELO. I don't know. I think we have the FEMA people here. Are they here? They are not here.

Mr. ROE. I don't think—I don't want to belabor one of the earlier parts of the discussions. I would like to have hearings that first gets to the facts, No. 1; what happened, two; what are we going to do about it. So it seems to me that the information that we are eliciting so far seems to be void of a coordinated process.

Is that a reasonable point to make?

Mr. ANGELO. Yes.

Mr. CORSO. Mr. Chairman, if I may, it is the, as I understand it, the responsibility of the Federal Management Agency to work with the State and local officials to develop the emergency preparedness plans that you are talking about. It is our approach to connect into that system, in our case, the Federal Energy Regulatory Commission—connect into that system through its emergency action plans.

Mr. ROE. Well, we have to depend on the fact that that system works. I am not applying the fault to be found here. What I hope to elicit before we finish, is that there will be additional people testifying from the State of Pennsylvania, and there is a local government panel that is going to testify.

We will ask those people would you keep this in mind. We want to know how the process works. There certainly is no value, in particularly this type of a situation where you have an extraordinary event that, for want of better phraseology, people had to be notified quickly to be able to respond to it. Is that a fair comment to make?

Mr. ANGELO. That is true.

Mr. ROE. So let's hold that further until we get to talk further with the officials from the State of Pennsylvania and from the local panel.

Mr. MURPHY. It seems as though the National Weather Service now is blaming it on the news media. The news media didn't get the information out. The Corps of Engineers said it is up to the National Weather Service to get the information out. They just testified that it is your primary responsibility. Do you accept that?

Mr. ANGELO. Yes, we do.

Mr. MURPHY. Will you tell us then who in Fayette County, Washington County and Greene County you notified, and when and how you notified them; what news media you notified and when and how. Can you tell us that?

Mr. ANGELO. I alluded to the times we issued our warnings. OK.

Mr. MURPHY. You alluded to that, Mr. Angelo, but in the flood and warning service of region III hazard report they state that the National Weather Service issued flood watches on Sunday, November 3, into Monday morning for flooding of small streams in eastern West Virginia.

Now, you testified that you did not issue any notification until 4:40 p.m. on November 4, and I want to know at 8:40 p.m., if that was the first time you notified, who did you notify? When did you notify them and how did you notify them?

You know, if you put it on teletype, people don't have them in their homes, and maybe there is nobody at the local radio station at that hour of the night or nobody at a local newspaper. I want to know—I guess what everyone wants to know is how did you assume your responsibilities? You told us it is your responsibility.

Mr. ANGELO. Yes, sir.

Mr. MURPHY. How did you carry that responsibility out?

Mr. ANGELO. OK, let me say this: the small stream warnings are issued by the weather side of the National Weather Service; that is the meteorologist take cares of that area. We wish you had our flood warning based upon specific points along the river. That comes out of our section, the National Weather Service office. That clarifies that point.

Mr. MURPHY. It does except I would then have to ask you why did it take you 24 hours from the time they issued small stream warnings until over 24 hours until you decided to issue a flood warning on the rivers.

Mr. ANGELO. Because small stream flood is much less rainfall than major streams. So, when the small streams were being flooded, there was very significant less rainfall than when we had—than the basis upon which we issued our warnings. Is that clear?

Let me state it this way. The small streams would flood at maybe 1 inch or 1½ inches; the river, between 2 and 3 inches to flood. So—

Mr. MURPHY. Except that you know from South Carolina to Rowlesburg the weather pattern.

Mr. ANGELO. We did know the weather pattern, but in any event we would have to base a flood forecast based on forecasted rainfall, and that is one of the weakest links in our operation is to try to forecast rainfall. It really can't be done.

If we start issuing flood forecasts based on forecasted rainfall, we are going to have more busts than success.

Mr. MURPHY. Let get back to me get back to my other question then. You first notified someone at 8:40 p.m.

Mr. ANGELO. Yes, sir.

Mr. MURPHY. On the night of the 4th.

Mr. ANGELO. Yes, sir.

Mr. MURPHY. By 2 o'clock that morning. I think this building was already inundated on the 5th.

Mr. ANGELO. Yes, sir.

Mr. MURPHY. Six hours later.

During that, say, 6 hours, and the 8:40 p.m., do you have with you the records of who you notified, how you notified them, and when?

Mr. ANGELO. No, I don't, sir.

Mr. MURPHY. Will you provide that to the committee, because I think that is extremely important in finding out the chain so that we can hopefully improve that chain of information as the chairman pointed out to the people.

If some of them would have had 2 hours notification, they could have saved thousands of dollars' worth of their furniture and goods.

Mr. ANGELO. I will provide that.

[The following was received from Mr. Angelo:]

NNNN:## A
ZCZC FITFLSPIT
11A00 NR11 041638
FLOOD STATEMENT
NATIONAL WEATHER SERVICE PITTSBURGH, PA
1130 AM EST MON NOV 04 1985

BC

..THE NATIONAL WEATHER SERVICE IN PITTSBURGH HAS CONTINUED A FLOOD WATCH FOR MOST OF WESTERN PENNSYLVANIA THROUGH TONIGHT..

RAIN WILL CONTINUE THROUGHOUT THE AFTERNOON AND INTO TONIGHT. RAIN COULD BE HEAVY AT TIMES. POSSIBLE FLOODING THIS AFTERNOON AND TONIGHT SHOULD MAINLY AFFECT AREAS OF POOR DRAINAGE AND SMALL STREAMS RUNNING OUT OF THEIR BANKS. LARGER STREAMS AND RIVERS WILL BEGIN TO RISE LATER THIS AFTERNOON OR EVENING.

RAIN IS LIKELY THROUGH TUESDAY. ALTHOUGH THE RAIN WILL BE LIGHTER ON TUESDAY..IT MAY CAUSE ADDITIONAL AND MORE EXTENSIVE FLOODING DURING THE DAY ON TUESDAY.

RAINFALL SINCE SUNDAY MORNING GENERALLY HAS BEEN AROUND 1 INCH NORTH OF INTERSTATE 80 AND 1 1/2 TO 2 1/2 INCHES OVER MOST OF SOUTHWESTERN PENNSYLVANIA. ADDITIONAL RAINFALL AMOUNTS OF TWO TO THREE INCHES OVER THE NEXT 24 HOURS COULD CAUSE FLOODING.

REMEMBER, A FLOOD WATCH MEANS FLOODING IS A POSSIBILITY NOT A CERTAINTY. BE PREPARED FOR QUICK ACTION IF A WARNING IS ISSUED OR FLOODING IS OBSERVED.

A LOW PRESSURE SYSTEM OVER NORTH CAROLINA WILL MOVE SLOWLY NORTH TO NEW YORK STATE DURING THE NEXT 24 HOURS..SPREADING RAIN AND PATCHES OF HEAVY RAIN AT TIMES FOR WESTERN PENNSYLVANIA.

ADDITIONAL FLOOD STATEMENTS WILL BE ISSUED LATER THIS AFTERNOON OR THIS EVENING.

ALESSI/COMEUX

NNNN 14 A
- ZCZC PTTTSPIT
TTAAOO KPIT 041817
FLOOD STATEMENT
NATIONAL WEATHER SERVICE PITTSBURGH, PA
115 PM EST MON NOV 04 1985

..MODERATE TO HEAVY RAIN OVER EXTREME WESTERN PENNSYLVANIA AND
NORTHERN ADJACENT WEST VIRGINIA PANHANDLE..

A FLOOD WATCH CONTINUES IN EFFECT FOR MOST OF WESTERN PENNSYLVANIA
THROUGH TONIGHT. RAIN..AT TIMES HEAVY..WILL CONTINUE THROUGHOUT
THE AFTERNOON AND TONIGHT.

SINCE 7 AM THIS MORNING RAIN HAS AMOUNTED TO 1 TO 2 INCHES AT
MOUNDSVILLE WEST VIRGINIA /1.81/..AND IN PENNSYLVANIA AT HICKORY IN
WASHINGTON COUNTY 1.30/ AND AT WAYNESBURG IN GREENE COUNTY 1.10.

ADDITIONAL RAINFALL OF ABOUT AN INCH AND A HALF BEFORE 7 PM THIS
EVENING WILL LIKELY CAUSE FLOODING MAINLY OVER EXTREME SOUTHWEST
PENNSYLVANIA AND THE BORDERING COUNTIES IN THE NORTHERN PANHANDLE
OF WEST VIRGINIA.

THERE HAVE BEEN NUMEROUS REPORTS OF BASEMENT FLOODING. SMALL STREAM
FLOODING MAY BE POSSIBLE THIS AFTERNOON AND FLOOD WARNINGS MAY
BE ISSUED.

REMEMBER..A FLOOD WATCH MEANS FLOODING IS A POSSIBILITY NOT A
CERTAINTY. BE PREPARED FOR QUICK ACTION IF A WARNING IS ISSUED
OR FLOODING IS OBSERVED.

ADDITIONAL FLOOD STATEMENTS WILL BE ISSUED LATER THIS AFTERNOON.

ALISS/COMTAUX

PITFLW11
TTAA00 KPIT 050056 COR
BULLETIN
FLOOD WARNING CORRECTED
NATIONAL WEATHER SERVICE PITTSBURGH, PA
755 PM EST TUE NOV 04 1985

...FLOOD WARNING FOR WHEELING CREEK TIL MIDNIGHT...

THE NATIONAL WEATHER SERVICE IN PITTSBURGH HAS ISSUED A FLOOD WARNING FOR THE WHEELING CREEK IN OHIO COUNTY WEST VIRGINIA UNTIL MIDNIGHT TONIGHT. AT 730PM THE STAGE WAS AT ELM GROVE WVA WAS 5.6 FEET RISING. THE CREEK IS EXPECTED TO CREST AROUND MIDNIGHT TONIGHT BETWEEN 7.5 AND 8 FEET. FLOOD STAGE IS 7 FEET. THAT PUTS THE CREEK ABOUT 1 FOOT OVER FLOOD STAGE.

FURTHER STATEMENTS WILL BE ISSUED.

VISNESKI

PITFLWPIT

TTRAGG KPIT 060102

BULLETIN

FLOOD WARNING UPDATED FOR THE MONONGAHELA RIVER
 NATIONAL WEATHER SERVICE PITTSBURGH, PA
 800 PM EST ~~16~~ NOV 85 1985

...RECORD FLOOD AT CHARLEROI...

THE NATIONAL WEATHER SERVICE HAS RAISED THE CREST FORECASTS FOR THE MONONGAHELA RIVER BY 4 FEET...AS WATER CONTINUES TO POUR INTO THE MONONGAHELA BASIN FROM MAJOR FLOODING IN WEST VIRGINIA.

RAINFALL TOTALS WERE AS MUCH AS 7 INCHES OVER THE LAST 4 DAYS IN THE RIVERS THAT FEED THE MONONGAHELA.

LOCK 4 CHARLEROI SHOULD CREST AT 44 FEET LATE THIS EVENING. THAT IS 18 FEET OVER FLOOD STAGE.

LOCK 3 ELIZABETH SHOULD CREST AT 34 FEET JUST AFTER MIDNIGHT...14 FEET OVER FLOOD STAGE.

MCKEESPORT IS EXPECTED TO CREST AT 24 FEET ABOUT 2AM WEDNESDAY...12 FEET OVER FLOOD STAGE.

LOCK 2 BRADDOCK SHOULD CREST AT 30 FEET ABOUT 3AM WEDNESDAY...11 FEET

THE 44 FOOT CREST EXPECTED AT CHARLEROI IS THE BIGGEST FLOOD EVER. PREVIOUS CRESTS AT CHARLEROI AND DATES...

38.4 FEET MARCH 18 1936

38.0 MAR 7 1967

36.2 MAR 5 1963 AND OCT 16 1954

35.8 JUN 4 1941

THE NEW CREST FORECASTS ARE...

	FLOOD STAGE	READING AT 7PM	CREST FORECAST IN FEET	TIME AND DAY
...MONONGAHELA RIVER...				

LOCK 4 CHARLEROI PA L 26	MISG	44.0 FT	10PM TUE NOV 5 1985
--------------------------	------	---------	---------------------

LOCK 3 ELIZABETH PA U 20	29.7	34.0 FT	1AM WEDNESDAY
--------------------------	------	---------	---------------

MCKEESPORT PA	12	MISG	24.0 FT 2AM WED
---------------	----	------	-----------------

LOCK 2 BRADDOCK PA U 19 FT	26.0	30.0	3AM WED NOV 6 1985
----------------------------	------	------	--------------------

THE PREFIX L BEFORE THE FLOOD STAGE REFERS TO THE LOWER GAGE READING. THE U...TO THE UPPER GAGE.

AN UPDATED WARNING ON THE OHIO RIVER WILL BE ISSUED WITHIN A FEW HOURS.

THE YOUGHIOGHENY RIVER IS FALLING AT CONNELLSVILLE AND RISING AT SUTERSVILLE. IT WILL CREST IN A FEW HOURS BELOW FLOOD STAGE. NO FLOODING IS EXPECTED ON THE YOUGHIOGHENY RIVER.

ANGELO/VISNESKI

BULLETIN
 FLOOD WARNING
 NATIONAL WEATHER SERVICE PITTSBURGH, PA
 338 PM EST WED NOV 06 1985
 PITFLWPIT

...FLOOD WARNING CONTINUES FOR PORTIONS OF THE OHIO AND MONONGHELA RIVERS...

THE OHIO RIVER AT PITTSBURGH /POINT/ CRESTED AT 26.2 FEET AT 5 AM WEDNESDAY. FLOOD STAGE IS 25 FEET. THE RIVER WILL FALL BELOW 22 FEET AROUND NOON THURSDAY. THE STAGE AT THE POINT WILL BE 18 FEET OR LESS BY SATURDAY. THE OHIO RIVER BETWEEN PITTSBURGH AND WHEELING WILL CREST TODAY.

THE MONONGAHELA RIVER CRESTED LAST NIGHT AND IS NOW FALLING. THE UPPER PORTION OF THE MONONGHELA RIVER BASIN HAS ALREADY RECEDED TO BELOW FLOOD STAGE IN MANY PLACES AND THE LOWER MONONGAHELA WILL BE WITHIN ITS BANKS ON THURSDAY MORNING.

NO FLOOD STAGES WERE EXCEEDED ON THE ALLEGHENY AND YOUGHIOGHENY.

	FLOOD	READING	CREST	FORECAST	TIME	AND	DAY
...UPPER OHIO RIVER..	STAGE	AT 0/00	IN	FET			
PITTSBURGH PA	25 FT	26.1 FT	CRESTED				
DASHIELDS PA	U 25	24.4	CRESTED				
MONTGOMERY DAM PA	L 33	30.7	CRESTED				
EAST LIVERPOOL OH	9	MSG	CRESTED				
WELLSVILLE OH	...	MSG	CRESTED				
NEW CUMBERLAND DAM WV	L 36	32.5	CRESTED				
WELLSBURG WVA	30	MSG	CRESTED				
PIKE ISLAND DAM WVA	L 37	32.0	36.9	AT 5 PM	WEDNESDAY		
WHEELING WHARF WVA	36	31.3	36.8	AT 7 PM	WEDNESDAY		
MOUNDSVILLE WVA	37	MSG	38.5	AT 9 PM	WEDNESDAY		
POWHATAN POINT OH	37	MSG	37.5	AT 11 PM	WEDNESDAY		
HANNIBAL L/D	L 35 FT	26.0 FT	34.5	AT 1 AM	THURSDAY		

THE PREFIX L BEFORE THE FLOOD STAGE REFERS TO THE LOWER GAGE READING. THE U REFERS TO UPPER GAGE. THESE FORECASTS ARE BASED ON THE LATEST DATA AND WILL BE UPDATED IF NECESSARY.

ANGELO

TTA00 KPIT 070115
FLOOD STATEMENT
NATIONAL WEATHER SERVICE PITTSBURGH, PA
815 PM EST ~~THU~~ NOV 06 1985

WED

AT 7PM THE MONONGAHELA RIVER WAS FALLING. MOST OF IT WAS BELOW FLOOD STAGE...EXCEPT AT LOCK 3 ELIZABETH AND LOCK 2 BRADDOCK. THESE POINTS ARE STILL A FEW FEET OVER FLOOD STAGE. THE RIVER THERE WILL FALL BACK WITHIN ITS BANKS THURSDAY MORNING.

AT 8PM...THE OHIO RIVER AT THE POINT IN PITTSBURGH WAS 23 FEET FALLING. THE RIVER WILL FALL BELOW 21 FEET EARLY THURSDAY...WHICH WILL UNCOVER THE TENTH STREET BYPASS. THE RIVER WILL FALL TO 18 FEET FRIDAY AFTERNOON AND THAT WILL UNCOVER THE MON PARKING WHARF.

THE UPPER OHIO RIVER FROM MOUNDVILLE WVA TO POWHATAN POINT OHIO WILL BE CRESTING THIS EVENING ABOUT HALF A FOOT OVER FLOOD STAGE.

HANNIBAL OHIO WILL CREST HALF A FOOT BELOW FLOOD STAGE 1AM THURSDAY.

	FLOOD STAGE	READING AT 7PM
...MONONGAHELA RIVER...		
LOCK 8 PT MARION PA L 26 FT		22.2 FT
LOCK 7 GREENSBORO PA U 21		18.7
MAXWELL LOCK/DAM PA L 32		26.6
LOCK 4 CHARLEROI PA L 26		MISSING
LOCK 3 ELIZABETH PA U 20		24.4
LOCK 2 BRADDOCK PA U 19 FT		23.7

THE PREFIX L BEFORE THE FLOOD STAGE REFERS TO THE LOWER GAGE READING. THE U...TO THE UPPER GAGE.
WOUS00 KPIT 122000

NNNN-## A

ZCZC PITRVF00R

ITAA00 NP11 6150ZPPAS

PITRVF00R *

NATIONAL WEATHER SERVICE PITTSBURGH PA

100ZAM EST WED NOV 6 1985

11/06/85 STAGE FORECASTS IN FEET, EASTERN STANDARD TIME, 24 HOUR CLOCK.

FLOOD DRSVD 0700 DAILY FORECASTSCREST.... A.ABV FS

STATION.....STAGE 0700 NOV 7 NOV 8 NOV 9 ..STAGE TIME. B.BLD FS

OHIO RIVER.....							
PITTSBURGH PA	25	26.1	27.5	19.5	18.5		B06/1200
DASHFIELDS U PA	25	24.4	23.0	18.5	16.0		
MONTGOMERY I PA	33	30.7	31.5	23.5	20.0	32.9	06/1000
NW (UMR)LAND L W	36	32.5	34.0	30.0	26.0	35.8	06/1300
PIKE ISLAND L W	37	32.0	32.0	32.0	25.0	36.9	06/1700
WHEELING W	36	31.3	36.0	31.4	22.4	36.8	06/1900
HANNIBAL L OH	35	26.0	33.0	31.0	22.5	34.5	07/0100

ALLEGHENY RIVER.....							
ELDER B PA	17	5.0	4.9	4.4	4.0		
OLEAN NY	19	2.2	2.0	1.8	1.6		
SALAMANCA NY	14	5.3	5.1	4.7	4.4		
FRANKLIN PA	17		2.8	2.7	2.6		
KITTANNING T W PA	21	13.9	13.8	13.4	12.7		
ACMONTIA L SW PA	17	12.9	13.0	12.7	12.3		

KLEIN CREEK.....							
HEARVILLE PA	13	12.1	11.5	10.0	8.0	12.5	06/1300

W. J. MONONGAHELA R.							
CLARKSBURG W	7		7.0	5.0	3.0		B07/0700

MONONGAHELA RIVER...							
MURKINTOWN I W	22		17.5	14.5	13.0		B06/1200
GREENSBORO U PA	21		18.5	16.5	15.0		B08/0100
BRADDOCK U PA	19		23.5	18.5	16.0		

TYGART RIVER.....							
PHILIPPI W	17		18.0	11.0	7.0		B07/1000

CHEAT RIVER.....							
PARSONS W	13		15.0	10.0	8.0		B07/1200

MAHONING RIVER.....							
WARRIN SO. ST OH	10	8.0	8.5	6.0	5.5	9.0	06/1600
LEAVITTSBURG OH	10	10.6	9.0	8.0	6.5	11.0	06/1300 B06/1900
YOUNGSTOWN OH	10		8.0	6.0	5.5		

BEAVER RIVER.....							
BEAVER FALLS PA	15	7.7	7.0	6.2	5.8		

PITRVF011

KWUS KWKA 061317 FWS

PITRVF011

NATIONAL WEATHER SERVICE

PITTSBURGH PA

WED NOV 06 1985

11/06/85 MEAN DAILY FLOW (1000 CU FT SEC), VELOCITY (MPH) FORECASTS

NNNN

RIVER STATION

...NOV 06... ..NOV 07.. ...NOV 08.. ...NOV 09..

FLOW VEL FLOW VEL FLOW VEL FLOW VEL

OHIO RIVER.....								
DASHFIELDS U PA	25	3.75	1.69	3.49	91.9	2.15	60.8	1.50
WHEELING W	36	3.06	2.08	3.54	112.6	2.72	69.9	1.86
WHEELING W	36	3.41	2.13	3.41	134.9	3.06	73.9	2.63
MOUNTAIN L SW PA	21	1.88	1.96	3.82	163.4	3.18	82.7	1.85

ALLEGHENY RIVER.....								
ACMONTIA L SW PA	17	1.66	3.27	1.66	34.1	1.45	26.2	1.15

MONONGAHELA RIVER...								
BRADDOCK U PA	19	2.07****	104.0	3.24	43.8	2.11	32.2	1.76

BEAVER RIVER.....								
BEAVER FALLS PA	15	1.01	11.0	1.38	7.7	1.03	6.3	0.86

END

...UPPER OHIO RIVER... STAGE AT 0700
 ...UPPER OHIO RIVER... STAGE AT 0700
 ...UPPER OHIO RIVER... STAGE AT 0700

...UPPER OHIO RIVER... STAGE AT 0700

THE MONONGAHELA RIVER CRESTED LAST NIGHT AND IS NOW FALLING. A RECORD
 FLOOD STAGE OF 44 FEET WAS REACHED AT CHARLEROI LOCK 4...18 FEET ABOVE
 FLOOD STAGE. THE PREVIOUS RECORD CREST OF 35 FEET OCCURRED ON
 MARCH 18 1938. RIVER LEVELS ON THE MONONGAHELA WILL FALL BELOW FLOOD
 STAGES ON THURSDAY.

THE ALLEGHENY AND YOUGHIOGHENY RIVERS HAVE CRESTED AND ARE NOW FALLING.
 NO FLOOD STAGES WERE EXCEEDED ON THE ALLEGHENY AND YOUGHIOGHENY.

THE ALLEGHENY AND YOUGHIOGHENY RIVERS HAVE CRESTED AND ARE NOW FALLING.

NO FLOOD STAGES WERE EXCEEDED ON THE ALLEGHENY AND YOUGHIOGHENY.
 FLOOD READING CREST FORECAST TIME AND DAY
 ...UPPER OHIO RIVER... STAGE AT 0700 IN FEET

STATION	STAGE	FLOOD READING	CREST FORECAST TIME AND DAY
PITTSBURGH PA	25 FT	26.1 FT	
DASHIELDS PA	U 25	24.4	
MONTGOMERY DAM PA	L 33	30.7	32.9 AT 10 AM WEDNESDAY
EAST LIVERPOOL OH	9	MSG	13.5 AT NOON WEDNESDAY
WELLSVILLE OH	...	MSG	671.9 AT 1 PM WEDNESDAY
NEW CUMBERLAND DAM WV	L 36	32.5	35.8 AT 1 PM WEDNESDAY
WELLSBURG WVA	30	MSG	35.5 AT 3 PM WEDNESDAY
PIKE ISLAND DAM WVAL	37	32.0	36.9 AT 5 PM WEDNESDAY
WHEELING WHARF WVA	36	31.3	36.8 AT 7 PM WEDNESDAY
MOUNDVILLE WVA	37	MSG	38.5 AT 9 PM WEDNESDAY
POWATAN POINT OH	37	MSG	37.5 AT 11 PM WEDNESDAY
HANNIBAL L/D	L 35 FT	26.0 FT	34.5 AT 1 AM THURSDAY

THE PREFIX L BEFORE THE FLOOD STAGE REFERS TO THE LOWER GAGE READING.

THE U REFERS TO UPPER GAGE.

THESE FORECASTS ARE BASED ON THE LATEST DATA AND WILL BE UPDATED
 IF NECESSARY.

ANNOUNCEMENT

1. Forecast
 2. Forecast
 3. Forecast
 4. Forecast
 5. Forecast
 6. Forecast
 7. Forecast
 8. Forecast
 9. Forecast
 10. Forecast

11. Forecast
 12. Forecast
 13. Forecast
 14. Forecast
 15. Forecast
 16. Forecast
 17. Forecast
 18. Forecast
 19. Forecast
 20. Forecast

21. Forecast
 22. Forecast
 23. Forecast
 24. Forecast
 25. Forecast
 26. Forecast
 27. Forecast
 28. Forecast
 29. Forecast
 30. Forecast

31. Forecast
 32. Forecast
 33. Forecast
 34. Forecast
 35. Forecast
 36. Forecast
 37. Forecast
 38. Forecast
 39. Forecast
 40. Forecast

41. Forecast
 42. Forecast
 43. Forecast
 44. Forecast
 45. Forecast
 46. Forecast
 47. Forecast
 48. Forecast
 49. Forecast
 50. Forecast

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50									
31.0	31.5	32.0	32.5	33.0	33.5	34.0	34.5	35.0	35.5	36.0	36.5	37.0	37.5	38.0	38.5	39.0	39.5	40.0	40.5	41.0	41.5	42.0	42.5	43.0	43.5	44.0	44.5	45.0	45.5	46.0	46.5	47.0	47.5	48.0	48.5	49.0	49.5	50.0	50.5	51.0	51.5	52.0	52.5	53.0	53.5	54.0	54.5	55.0	55.5	56.0	56.5	57.0	57.5	58.0	58.5	59.0	59.5	60.0

THE PREFIX L BEFORE THE FLOOD STAGE REFERS TO THE LOWER GAGE READING.
 THE U REFERS TO UPPER GAGE.

THESE FORECASTS ARE BASED ON THE LATEST DATA AND WILL BE UPDATED
 IF NECESSARY.

ANRELO

PITFLWPIT
 TTAA00 KPIT 062340
 BULLETIN
 FLOOD WARNING
 NATIONAL WEATHER SERVICE PITTSBURGH, PA
 634 PM EST WED NOV 06 1985
 TPITFLWPIT

THE OHIO RIVER AT PITTSBURGH /POINT/ CRESTED AT 26.2 FEET AT 5 AM WEDNESDAY. FLOOD STAGE IS 25 FEET. THE RIVER WILL FALL BELOW 21 FEET EARLY ON THURSDAY. THE STAGE AT THE POINT WILL BE 18 FEET OR LESS BY FRIDAY AFTERNOON.

THE MONONGHELA RIVER CRESTED LAST NIGHT AND IS NOW FALLING. THE UPPER PORTION OF THE MONONGHELA RIVER BASIN HAS ALREADY RECEDDED TO BELOW FLOOD STAGE IN MANY PLACES AND THE LOWER MONONGHELA WILL BE WITHIN ITS BANKS ON THURSDAY MORNING.

NO FLOOD STAGES WERE EXCEEDED ON THE ALLEGHENY AND YOUGHIOGENY.

THE OHIO RIVER HAS CRESTED DOWN TO WHEELING WVA.

THE FOLLOWING POINTS WILL CREST AT THE STAGE AND TIMES INDICATED.

...	UPPER OHIO RIVER..	STAGE	FLOOD READING AT 0700	IN FEET	CREST FORECAST TIME AND DAY
	MOUNDSVILLE WVA	37	MSG		38.5 AT 9 PM WEDNESDAY
	POWHATAN POINT OH	37	MSG		37.5 AT 11 PM WEDNESDAY
	HANNIBAL L/D	L 35 FT	26.0 FT		34.5 AT 1 AM THURSDAY

THE PREFIX L BEFORE THE FLOOD STAGE REFERS TO THE LOWER GAGE READING.

ADDITIONAL RAINFALL FORECAST FOR THE NEXT 24 HOURS WILL NOT MATERIALLY SLOW THE RIVER RECESSIONS.

NO FURTHER STATEMENTS WILL BE ISSUED UNLESS CONDITIONS WARRANT.

ANGELO

TTAPD KPIT 070115
 FLOOD STAGE 84T
 NATIONAL WEATHER SERVICE PITTSBURGH, PA
 815 PM EDT ~~07/01/80~~ WED

AT 0911 THE RIVER OHIO RIVER WAS FALLING. MOST OF IT WAS BELOW
 FLOOD STAGE...EXCEPT AT LOCK 3 ELIZABETH AND LOCK 2 BRADDOCK. THESE
 POINTS ARE STILL A FEW FEET OVER FLOOD STAGE. THE RIVER THERE WILL
 FALL...

AT 0911 THE RIVER OHIO AT THE POINT IN PITTSBURGH WAS 10 FEET FALLING.
 THE RIVER THERE IS STILL A FEW FEET OVER FLOOD STAGE. THE RIVER
 THERE WILL FALL...THE RIVER THERE WILL FALL...THE RIVER THERE
 WILL FALL...

THE UPPER OHIO RIVER FROM HUNTSVILLE TO BRADDOCK POINT OHIO WILL
 BE AT OR BELOW FLOOD STAGE...THE RIVER THERE WILL FALL...

AT 0911 THE RIVER OHIO AT BRADDOCK POINT OHIO WAS 4 FEET OVER FLOOD STAGE...

LOCK 7 BRADDOCK PA U 19 FT 23.7
 MAXWELL LOCK/DAN PA L 32 26.6
 LOCK 4 CHARLEROI PA L 26 MISSING
 LOCK 3 ELIZABETH PA U 20 24.4
 LOCK 2 BRADDOCK PA U 19 FT 23.7

LOCK 7 BRADDOCK PA U 19 FT 23.7

MAXWELL LOCK/DAN PA L 32 26.6

LOCK 4 CHARLEROI PA L 26 MISSING

LOCK 3 ELIZABETH PA U 20 24.4

LOCK 2 BRADDOCK PA U 19 FT 23.7

THE PREFIX L BEFORE THE FLOOD STAGE REFERS TO THE LOWER GAGE READING.
 THE U...TO THE UPPER GAGE.
 WDU500 KPIT 122000

76

ZCZC #0
 TTA00 NP17 071332
 FLOOD STATEMENT
 NATIONAL WEATHER SERVICE PITTSBURGH, PA
 831 AM EST THU NOV 07 1985

...RIVERS CONTINUE TO RECESS IN AFTERMATH OF SEVERE FLOODING...

ON THE MONONGAHELA RIVER..ONLY LOCK 4 CHARLEROI REMAINS ABOVE FLOOD STAGE THIS MORNING. THE RIVER AT LOCK 4 CHARLEROI WILL FALL BELOW FLOOD STAGE LATER TODAY AS THE RIVER CONTINUES ITS RECESSION.

AT 9 AM THE STAGE READING AT THE OHIO RIVER AT PITTSBURGH /FOINT/ WAS WAS AT 20.3 FEET AND FALLING. FLOOD STAGE IS 25 FEET. THE OHIO RIVER WILL CONTINUE TO FALL STEADILY THROUGHOUT THE DAY..AND WILL RETURN TO ITS NORMAL POOL LEVEL BY SATURDAY MORNING.

FURTHER DOWNSTREAM ON THE OHIO RIVER..THE RIVER HAS CRESTED AT ALL LOCKS AND CONTINUES TO FALL.

EIPEN

NNNN

11 7

ZOO PITTSBURGH
 TTA000 NRIT 071256
 FLOOD STATEMENT
 NATIONAL WEATHER SERVICE PITTSBURGH, PA
 103 PM EST THU NOV 07 1985

..ALL PITTSBURGH DISTRICT RIVERS FALL TO BELOW FLOOD STAGES..

THE ENTIRE MONONGAHELA RIVER IS NOW BELOW FLOOD STAGE. LOCK 4 CHARLESTON..THE LAST OF THE LOCKS IN THE DISTRICT TO FALL BELOW FLOOD STAGE..REPORTED A STAGE READING OF 25.8 FEET AT 145 PM. FLOOD STAGE THERE IS 26 FEET.

THE LAST OF THE STAGE READING ON THE OHIO RIVER AT PITTSBURGH POINT WAS 19.3 FEET AND FALLING. FLOOD STAGE IS 20 FEET.

ALL PITTSBURGH DISTRICT RIVERS WILL CONTINUE TO FALL THROUGH FRIDAY.

EISEN

Mr. CORSO. I have found in my files the notification times and persons for Greene County and Fayette County. I will furnish them.

Mr. ROE. Let me suggest that.

Mr. WISE. Would you yield? Out of curiosity, how do you get them? Do you have them and he doesn't.

Mr. CORSO. I am speaking to the emergency action plan of the Federal Energy Regulatory Commission and the notification procedures they are under, not Weather Service responsibilities.

Mr. ROE. Let me make a point at this stage of our hearing, ladies and gentlemen. Believe me, I understand the emotions that are involved much more than you may believe, because in my own State, I have suffered through many, many of these issues, and just as badly as you have.

However, what we are trying to do here today is a number of things. Let me just quickly state that, and we are fighting a time-frame. I want to be sure, most assured that the people who are affected by this situation get a chance to respond, and we don't have to leave without listening to the people. So I would admonish, if I may, with the greatest respect, our members.

We are unfolding the situation to try to be a little bit shorter, briefer, if you like, so we can get the chance to get the response from the people because I know there are other items people want to call to our attention. That is No. 1.

No. 2, I don't want to shut off this discussion here. We can provide the names and times—we would ask you to do that for the record, of course. We will do that, but then you will be staying in abeyance because I do want to get the response from the west Pennsylvania people, and I want to be able to talk to the governmental—State government people here and county government people to see what process they have, and how we can lock this together.

I think one thing that is abundantly clear, without looking to pin blame or whatever, is that the process isn't working effectively. If the process were working effectively, then many of the people, as was said before, that have lost their belongings and so forth could have been warned sooner, could have been helped themselves more,

rather than being caught in the situation that they were caught in. So, therefore, hold that open. Give us the information that the gentleman has requested, where you have it and so forth, because you are speaking from areas of responsibility. Then we will come back to this issue again when we have a chance to discuss with the people of Pennsylvania State, of Pennsylvania and local government, as to how they are operating; how they see it operate, and where the holes may be during the improvement.

Are there any further questions of these witnesses at this moment? If not, we want to thank you very much for your input, gentlemen. If you would be kind enough to remain.

[Mr. Corso's prepared statement follows:]

TESTIMONY

OF

RONALD A. CORSO

DIRECTOR, DIVISION OF INSPECTIONS

OFFICE OF HYDROPOWER LICENSING

FEDERAL ENERGY REGULATORY COMMISSION

BEFORE THE

SUBCOMMITTEE ON WATER RESOURCES OF THE

COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION

U.S. HOUSE OF REPRESENTATIVES

February 7, 1986

Mr. Chairman and Members of the Subcommittee on Water Resources, I appreciate the opportunity to appear before you today on behalf of the Federal Energy Regulatory Commission (FERC) to testify on the devastating flood that occurred on the Monongahela and Cheat Rivers in early November 1985. My position with the FERC is Director, Division of Inspections, Office of Hydropower Licensing. I am responsible for supervising the Commission's dam safety program and post-license administration, which includes ensuring that Licensees properly construct, operate, and maintain licensed projects. The views expressed in my testimony are the views of the staff of the Division of Inspections, Office of Hydropower Licensing.

Pursuant to the authority granted by Congress under Section 4(e) of the Federal Power Act, the FERC licenses non-Federal hydroelectric projects, including the dams, reservoirs, powerhouses and all other appurtenant facilities. The FERC licensed the Lake Lynn Project, FERC Project No. 2459, in 1970 after a Supreme Court decision expanding the Commission's jurisdiction.

The Lake Lynn Project (Cheat Lake) was constructed in 1926. The Project consists of a dam 125 feet high impounding a reservoir with a surface area of 1,739 acres and a gross storage capacity of 72,300 acre-feet, a powerhouse with an installed capacity of 51,200 kilowatts, and appurtenant electrical and mechanical equipment. The dam includes a spillway, controlled by 26 tainter gates, for releasing flood flows. The project was built primarily for power production, but does provide other benefits such as recreation. The project has a small usable storage capacity of about 1,700 acre-feet per foot or 29,000 acre-ft. that is used to regulate stream flows principally for power production.

The Commission staff has reviewed hydrologic data and the project operation by the Licensee during the flood event of November 4 and 5, 1985. In summary, our review found that operation of the project was consistent with the license. We have independently confirmed that the Licensee did issue advance flood warnings in accordance with the procedures outlined in the Emergency Action Plan required by the Commission's Regulations.

In evaluating the operation of Lake Lynn Dam during this unusual flood event, it is important to note that the project was constructed for the primary purpose of generating hydroelectric power and that Lake Lynn has no storage capacity for flood control. Therefore, during periods of high flows, the dam must pass essentially all flood flows through the reservoir. In other words, while the project's operation does not of lower downstream flood levels, it likewise does not cause any increase in the flood levels.

During this particular flood event the Licensee, based on information telemetered from an upstream gaging station, operated the project powerhouse for most of Monday, November 4, 1985, at maximum hydraulic capacity. Although this is a less efficient operation for power production, it permitted the Licensee to discharge flows (about 9,000 cfs) through the powerhouse to predraw or lower the reservoir in anticipation of flood inflows. The reservoir was lowered from its normal operating water surface elevation of 870.0 feet to elevation 866.08 feet by 6:00 P.M. on November 4, 1985. This mode of operation is common and accepted practice in advance of a developing flood event to provide storage capacity to attenuate inflows. These early releases were made before the peak flows reached the project.

If the flood of November 1985 had been a normal event, lowering the reservoir could have had some effect on the flood flows. Due to the unprecedented magnitude of the flood, however, lowering Lake Lynn had virtually no effect on flood flows due to the small amount of storage space available. To put this in perspective, the available storage capacity of Lake Lynn between elevation 866.08 and the peak reservoir elevation of 876.5 feet experienced during the flood, is estimated to be about 17,000 acre-feet. In comparison, the flood volume has been estimated in excess of 300,000 acre-feet. Therefore, there was insufficient storage to affect peak flows significantly.

Our review of the project's operation shows that starting at 7:30 P.M. on Monday, November 4, 1985, the Licensee began opening spillway gates to release the high inflows to the reservoir. Throughout Monday night and continuing on Tuesday morning, the reservoir level rose to a peak elevation of 876.5 feet at approximately 10:30 A.M. This is the highest elevation ever recorded at Lake Lynn. The gates were gradually opened so as not to release large amounts of flow at one time and to provide for consistent control of the reservoir level. Although the gates were fully opened by early Tuesday morning, November 5, 1985, the reservoir continued to rise until the peak at 10:30 A.M. This indicates that until late Tuesday morning, inflow to the reservoir was exceeding outflow. Visual observations by operating personnel indicated that the reservoir level remained within 1 foot of the peak level until after 12:00 noon. If the Licensee had not opened all the spillway gates or if the gates were closed earlier, the reservoir would have reached even higher elevations and possibly would have caused overtopping of the dam thereby jeopardizing its structural stability or causing debris to discharge over the dam.

Given the unprecedented magnitude of flood debris collected at the dam, it was not possible to prevent clogging of the spillway bays. Conventional methods for controlling debris, such as trash booms, are effective under normal conditions. It is questionable whether a trash boom would have been effective in this case due to the large amount of debris. In any event, flows released due to clogging of the spillway by debris occurred after the flood peak flows and do not appear to have contributed to the flooding downstream.

Part 12, Subpart C of the Commission's Regulations requires every applicant and licensee to develop and file an Emergency Action Plan (EAP). The EAP, which is developed in consultation and cooperation with appropriate Federal, state, and local emergency preparedness agencies, is intended to provide instructions and procedures to Licensee's personnel for providing early warning to upstream and downstream inhabitants, and other persons in the vicinity who might be affected by a project emergency. In this context, a project emergency is defined as an impending or actual sudden release of water at the project caused by natural disaster (flood), accident, or failure of the project works. The EAP for every licensed or exempted project is reviewed for adequacy by Commission staff, and constantly updated, as a result of mandatory annual reviews.

The Corps of Engineers at Lock and Dam No. 7 immediately downstream was notified by telephone prior to any gate operations at Lake Lynn and contact was maintained throughout the event. In addition, in accordance with the requirements of the EAP, both Fayette County and Green County were notified late Monday evening and contact was maintained throughout the event. In response to our inquiries, both localities indicated they were satisfied with the coordination and notification given by the Licensee.

With respect to the Licensee's compliance with the Federal Power Act, the Commission has promulgated regulations (18 CFR Part 12) governing the safe operation of projects licensed by the Commission. In addition, the license for Project No. 2459 includes Article 33 requiring that project operation ensure that flood flows released by the project are no greater than would have existed without the project. Our review of the project's operation during the November 1985 flood found that the Licensee complied with the Commission's Regulations and its license.

Pursuant to the Federal Power Act and the Commission's Regulations, the Corps of Engineers is consulted by the Commission on the flood control potential of a project proposed for license, the project's impact on existing flood control measures, and whether flood control should be a project purpose. The Corps recommendations on these projects may be incorporated into the project license by the Commission.

Accordingly, for large hydroelectric projects that may have significant flood control potential, this potential is established and coordinated with any existing Federal flood control projects. For smaller projects without appreciable flood control capability, the Commission ensures that the project will not detrimentally affect existing flood control projects or aggravate flood conditions. In other words, inflow entering the project reservoir must be equal to the releases made at the project dams. This is stated in the license by special articles requiring that the Licensee shall not release from the project, during flood periods, flows that would exceed those which would have occurred in the absence of the project.

Since the Lake Lynn Project has no appreciable flood control capability, the license required in Article 33 that flows released from the project not exceed flows that would have occurred without the project.

This concludes my testimony.

Mr. ROE. Our next witness is Mr. Donald Whipp, manager of public information, of the Lake Lynn Power Station. We welcome you from the West Penn Power Co., and who is going to start with the first testimony or the joint testimony?

TESTIMONY OF DONALD WHIPP, MANAGER, PUBLIC INFORMATION, WEST PENN POWER CO., ACCOMPANIED BY BORIS PETROFF, STATION SUPERINTENDENT, LAKE LYNN POWER STATION

Mr. WHIPP. All right, fine, I would like to thank you for this opportunity. Since the time of the flooding, West Penn Power has participated in a number of hearings like this, and we, early in the month of December, invited every elected official from the area of the Monongahela and Cheat River to come to us and listened to the story that they had to tell and take them on a tour of the Lake Lynn project.

Unfortunately, we weren't able to attract as many people as you have here this morning, but we hope that as a result of what we are going to say, we have submitted prepared testimony, that you get a better understanding of what happened at Lake Lynn Dam; what did happen during that period of time.

Two things I would like to do: first, we have a consultant report that was prepared after the flooding which does list the names of those people who were contacted, and when they were contacted during the emergency management plan that went into effect on the night of the fourth, so I would like to introduce this, if I may.

Mr. ROE. We will accept it as part of the record.

Mr. WHIPP. All right.

Second, I would like to introduce again a set of photographs which shows the station at the time of the flood and immediately thereafter.

Mr. ROE. All right.

Mr. WHIPP. To address another point that was made before, Washington County has now been added to our emergency action plan.

Based on what has been said here, I think it may be wise for me just to briefly describe how we get data to operate this dam and what happens with that data; what we do with it as far as notifying other people down stream.

Mr. ROE. Do you have a formal testimony to make, too?

Mr. WHIPP. Yes.

Mr. ROE. Well, make that part of the record. You can amplify for us.

Mr. WHIPP. Yes, sir.

Mr. ROE. Without objection, so ordered.

Mr. WHIPP. During these 2 days, to begin with, we got other information from a variety of sources on the condition of the Cheat River, which is the river that flows into Lake Lynn Dam. We get it from a river gauge at Parsons, WV, about 75 miles up stream. We get information from the Charleston Weather Bureau. We get information from our own air science consultant weather forecaster in Pittsburgh. We accumulate information at Lake Lynn Power Station and also at Albright Station up river from Lake Lynn.

As a result of all the information we had, on the 4th of November, up until the evening of the 4th of November, their really wasn't anything for us to be greatly concerned about. The river was not rising at an alarming rate at Parsons.

Later in the day it rose 10 feet in 5 hours. Up to that point it was gradually rising. And early in the morning of Monday, the 4th of November, 3 o'clock in the morning, knowing that it had been raining some, but nothing more than we had a number of times before, we begin to run the power station. We began to operate the turbo. This is basically a peaking station, which means we run it from the middle of the morning to the middle of the evening and close it down at night. It doesn't generate at night.

Mr. MURPHY. Will you clarify? You said Monday morning. You mean the fourth, early in the morning of the fourth?

Mr. WHIPP. Yes, sir 3 o'clock in the morning on the fourth.

We began to operate the power tunnels. We have two ways of releasing water from Lake Lynn. One is through the power tunnels, and another is through gates that are on top of the dam itself. That can be opened to release water there, but under the circumstances, as we knew them, on the 4th of November, we decided that it was appropriate to release water through the power tunnels, so we would not ordinarily be generating then.

Now, we can release between 8,000 and 10,000 cubic feet a second through those tunnels. We did that. We began early in the morning. We couldn't do it during the day.

As we continued to do it, we lowered the depth of the reservoir behind the dam. Normal elevation of Lake Lynn is 870 feet above sea level. Because we operated these tunnels, we were able to drop that 866 feet by about 6 o'clock on Monday morning.

In the meanwhile, the water continued to rise. We continued to receive this data principally from the river gauge at Parsons. As that gauge rose during the day, particularly in the late afternoon of that day, when the water level got to Parson's this triggers our power control center people in Greensburg, PA, to call the U.S. Weather Bureau.

We did that, and as it increased another 1½ we are also required to call them both in Pittsburgh and in Charlestown, and we did that later in the evening and into the night. The water continued to rise at Lake Lynn, and we knew it was rising because of the gauge at Parsons, and about 7 o'clock that evening it was decided after a conversation between our manager of the station and our operating people at our power control center, to begin to open some of the gates on top of the dam.

We did that starting at about 7:30 on Monday evening. Now, as we opened these gates, there are certain points in opening these. These gates in dimension are about 20 feet wide. They are about 17 feet high, and they raise from the bottom. If the gates are not opened and there is more water in the pool than the 870-foot level, 7:30, it simply runs over the top or through the station.

This is the control that we have on the dam. About 7:30 Monday evening, we began to lift those gates from the bottom and open some of them to release water. As we released that water, there is certain points in this operation. If we release one gate 18 inches, that is one gate opening. There are 26 gates across the top.

After we get to No. 50 gate operations, that then requires us, according to the emergency plan, the one that has been approved by FERC and that one mentioned earlier, to contact the Emergency Management Agency in both Greene and Fayette Counties. And Washington County has since been added.

The first two stages in this alert plan are basically to notify if something is likely to happen, we have opened these gates. When we reached the third stage of this plan, and that was shortly after midnight, and you have in that report the persons to whom we spoke shortly after midnight. That then required the Emergency Management Agencies to notify within their counties, State police, sheriff's department, this kind of thing—as far as our obligation in this is concerned, it essentially ends when we have called the Emergency Management Office, and are reasonably certain that they understand what we are calling about and explain this to them, the number of gate operations at Lake Lynn.

We continued this during the night, and the last gate operation occurred around daylight on the morning of the fifth, and at that point in time all the water that is coming down the Cheat was coming across the top of our dam or around the dam or through the station as if the dam was not there.

The water at the station maybe to some extent because of hundreds of tons of debris that backed up behind the dam, reached a level of 876.5 feet at about 10:30 on Tuesday morning. It had never been that high before in the history of the dam. The first unit there went on line in 1926.

The notifications that we made came from our transmission and direction center in Greensburg. At the same time—not at the same moment, but during the course of Monday evening, people in that center or people in our power control center were also in touch with the operator at Maxwell Dam, and at lock 7, and as I mentioned earlier, we were also in contact with the weather bureau both in Pittsburgh and in Charleston with the great level of the Cheat rising at Parsons, and with the gate operations that occurred after midnight.

Now, I apologize for the brevity of that, but that is essentially what happened on the evening of the fourth and early morning of the fifth.

Mr. ROE. Mr. Petroff, anything to add?

Mr. PETROFF. No, sir.

Mr. ROE. Questions?

Mr. MURPHY. Thank you, Mr. Chairman.

Mr. Whipp, I did attend—I accepted that invitation. I did attend the briefing and tour of the dam facility, and at that time I believe we were advised that your personnel at the dam were in constant contact with the Corps of Engineers.

Can you identify when the constant contact commenced in regard to the flooding, and who at the corps and where they were contacted.

Mr. WHIPP. Yes, sir, I can go through a number of these pages now or leave them with you. The first contact to lock No. 7 occurred at 1716 on the end of November 4. The second one—

Mr. MURPHY. That is shortly before when the National Weather Service issued their flood warning.

Mr. WHIPP. I don't know about the National Weather Service in Pittsburgh when they did. They relied on the National Weather Service in Charleston because of the headquarters of the Cheat being in West Virginia.

Mr. MURPHY. Then you would have known it before the National Weather Service issued their warning.

Mr. WHIPP. The information that we have shows that the first warning of any flooding on the upper reaches of the Cheat was at 2:45 in the afternoon of the fourth.

Mr. MURPHY. And yet you waited 12 hours before you decided to issue the third stage warning or the flood warning which is really flood warning, until early the next morning. By that time, the water was already inside this building.

Mr. WHIPP. Our first warning went out to the emergency management agencies at 10 o'clock in the evening, and this was not at this point still an unusual circumstance, the river at the Parsons, the gauge there.

Mr. MURPHY. Even though early in the day on November 4, you advised us a few minutes ago that the Cheat River at Parsons had risen 10 feet in 5 hours.

Mr. WHIPP. No, sir, I didn't say in the morning of that day. I said later that day. In the evening of that time, between the hours roughly of 5 and 9 o'clock in the evening, it rose 10 feet.

Mr. MURPHY. I noticed you have provided us with the different people that you contacted and the hours in which you contacted them for, first, second and third stage. Now at first stage it is when you have 50 gate operations; is that correct?

Mr. WHIPP. That is correct.

Mr. MURPHY. And what is the second stage?

Mr. WHIPP. I believe it is 1984—1980 excuse me.

Mr. MURPHY. 1984?

Mr. WHIPP. 1980.

Mr. MURPHY. And then third stage how many gate operations?

Mr. WHIPP. 104, 100.

Mr. MURPHY. Should be 100.

Mr. WHIPP. Yes, sir.

Mr. MURPHY. Now, at that time, when you issued the third stage alert, all of your locks were open and your people had abandoned the facility; isn't that correct?

Mr. WHIPP. No, this occurred shortly after midnight on the morning of the fifth; 0035 is when we contacted the agencies at the third stage alert.

Mr. MURPHY. By that time you had abandoned.

Mr. WHIPP. Not the facility, no.

Mr. MURPHY. When did you abandon the facility, Mr. Petroff, you were there.

Mr. PETROFF. Yes, sir.

Mr. MURPHY. When did you abandon the facility?

Mr. PETROFF. No. 1, we didn't abandon. More or less what we had done was at about 9 o'clock in the morning when we lose No. 1 transformer bank, we lose one of the generators, at about 9 a.m. on the fifth. We lose No. 1 transformer bank. We lose No. 4 generator. We decided at that time to remove Nos. 1, 2, and 3 units.

Mr. MURPHY. Your personnel were in the facility overnight in the powerplant.

Mr. PETROFF. Night of the fourth and fifth we were in the plant.

Mr. MURPHY. What time did you leave the facility?

Mr. PETROFF. We left the facility around 10:30. I was the last one out on the fifth.

Mr. MURPHY. What time did you leave all of the gates open?

Mr. PETROFF. About 6 a.m. on the fifth all gates were open.

Mr. MURPHY. OK. Thank you.

Mr. WHIPP. You used the word, "abandon." They walked to the switchyard at the station, which is about as far as from here to the VFW and stayed there and came back into the station.

Mr. ROE. What we are trying to get at, you made a statement, and you said earlier that you followed the plan as you were to follow it.

Mr. WHIPP. Yes, sir.

Mr. ROE. You have so testified.

Mr. WHIPP. Yes, sir.

Mr. ROE. I consider that to be part of the hole. I don't care if that is the beginning or the end of the problem because it relates to a host of other things. You have mentioned that you are going to add Washington County, I believe you said, which seems logical to do. You might even take a look and see further down if it is necessary. Really getting at this point, coordination is obviously somewhat better. So is the interpretation of the fact of getting back to the people to serve the needs of the members; isn't that basically what we are here for.

Mr. WHIPP. Yes, sir.

Mr. ROE. Nobody admonished what you have done or what you have to do. That is part 1.

Mr. WHIPP. Yes, sir.

Mr. ROE. We want to thank you both for testifying and if you would be kind enough to wait until we get the State and county people, I would appreciate that.

Mr. WHIPP. Thank you very much.

[Mr. Whipp's prepared statement and attachments follow:]

2-4-86

Mr. Donald Whipp
Manager
Public Information

STATEMENT OF
WEST PENN POWER COMPANY
CONCERNING THE 1985 ELECTION DAY FLOOD

There is an apparent misconception or lack of information concerning the operation of West Penn Power facilities during the flooding that occurred on November 4 and 5 on the Cheat and Monongahela rivers. Some persons have inferred or speculated that through the operation of West Penn Power's Lake Lynn dam and generating station, the utility was in some way responsible for the flooding on the rivers. This is simply not true.

The tragic disaster resulted from unusually high amounts of rainfall in the headwater areas of the Cheat River and Monongahela River in West Virginia that created flooding not expected to occur more often than once in 100 years. Facilities operated by West Penn Power and its affiliates, Monongahela Power Company and The Potomac Edison Company, were victims of the flooding which caused tens of millions of dollars worth of damage at four generating stations. Our facilities at the Lake Lynn dam were operated properly and the notices provided for in the emergency plan approved by the Federal Energy Regulatory Commission (FERC) were properly given.

The first unit at the Lake Lynn generating station went on line in the summer of 1926. It is licensed by the Federal Energy Regulatory Commission (formerly the Federal Power Commission) for the purpose of generating electricity.

The Lake Lynn dam is a hydroelectric dam. Lake Lynn dam is not and never has been a flood control dam. It is fundamentally different from a flood control dam. Unfortunately, there is no flood control dam on the Cheat River.

During the flood, on the morning of Tuesday, November 5, 1985, the water level at Lake Lynn reached 876.5 feet above sea level. It had never been that high before in the history of the station. Water was flowing through the opened spillway taintor gates in the dam and was also coming into the generating station itself.

Lake Lynn is one of four generating stations located on the Cheat and Monongahela rivers where West Penn and its affiliates suffered tens of millions of dollars worth of damage as a result of the flood. The Albright Power Station, upstream from Lake Lynn, at Albright, West Virginia, suffered the greatest damage and some units there will not be back on line until next summer. Hatfield's Ferry, downstream from Lake Lynn, was also heavily damaged.

Flooding on the Cheat was caused by extremely high levels of rainfall in the watershed of the river, especially in Tucker and Preston Counties, West Virginia. During a two-day period ending at 7:00 a.m. on November 5, about

9.37 (preliminary figure) inches of rain fell in the Canaan Valley, part of the upper headwaters of the Cheat. Two persons are known dead in Preston county. About 30 people were killed in West Virginia and eight others are still missing.

The small town of Parsons is located about 75 miles up river from the Lake Lynn station. Gauges at Parsons supply data to West Penn and various government agencies on the level of the river there. The gauge and gauge building at Parsons were destroyed during the flood with the last reading at about 19-1/2 feet after rising about 10 feet in five hours. It is estimated that the flood crest there was about 23.8 feet. (A new gauge has now been installed at a different location at Parsons.) West Virginia's Governor Moore says Parsons was the hardest hit community in West Virginia. The Preston County communities of Rowlesburg and Albright were the second hardest hit in the State.

In response to the increases in the water level at Parsons, we began to run the turbines at Lake Lynn as much as possible so that more water would be passed through the power generating tunnels. The normal pool level at Lake Lynn is 870 feet above sea level. At about 6:00 p.m. on Monday evening, the pool level at Lake Lynn was about 866 feet.

Because of the high river readings at Parsons and the fact that the pool level began to increase, we began to open the gates at Lake Lynn. (The first operation was at about 7:30 p.m. on November 4.) Opening the gates released water from the lake, which would eventually have run over top of the gates had

they not been opened. It is important to note that although the gates were opened, the water level in the reservoir continued to rise throughout the night and until about 10:30 a.m. on November 5.

Shortly after 10:00 p.m. on November 4, after we had reached a specified number of gate openings, we initiated our emergency plan for notifying counties downstream from the lake. The Emergency Management Agencies in Fayette and Greene Counties were notified four times during the night as we continued to open the gates. The Federal Energy Regulatory Commission was also notified as specified in the emergency plan. (At the request of the Washington County officials, we have since added Washington County, Pennsylvania to the list we notify when the emergency plan is activated.) By about 7:30 a.m. on November 5, all gate operations had been completed.

By about 10:30 a.m. on Tuesday, the water level reached 876.5 feet above sea level--about ten and one half feet higher than the reservoir level on Monday evening. In the afternoon on November 5, the reservoir was dropping and receded to about 871 feet by about five o'clock on November 5, still about five feet higher than Monday night, and close to the normal operating level.

During the flooding, an incredible amount of debris washed down the river, collected behind the dam and jammed in the gate openings. This prevented us from closing the gates. With the gates jammed open, the reservoir level continued to drop and was at about 855 feet on Sunday, November 10 when we were able to close the gates. At some point, photographs were taken of the lake at or near this level and apparently gave rise to a mistaken impression that we had somehow lowered the lake to this level during the flood crest. This is simply not so.

It should be noted that by now it is estimated that over 90 percent of the flood debris has been removed from the immediate power plant and dam area by a contractor working under contract with the Corps of Engineers.

The merits of installing a boom to trap debris above the dam were raised at a hearing conducted by Senator Arlen Specter December 31 at Charleroi, Pennsylvania. The attached letter (w/o attachment) prepared by the Corps of Engineers and West Penn Power in response to a request by Senator Specter concludes that such a trash boom would have had little impact, if any, on the recent flooding or future flooding.

A consultant retained by West Penn Power Company has conducted a visual inspection of the Lake Lynn hydroelectric project and said the dam is in good condition and experienced only minor damage in the flood.

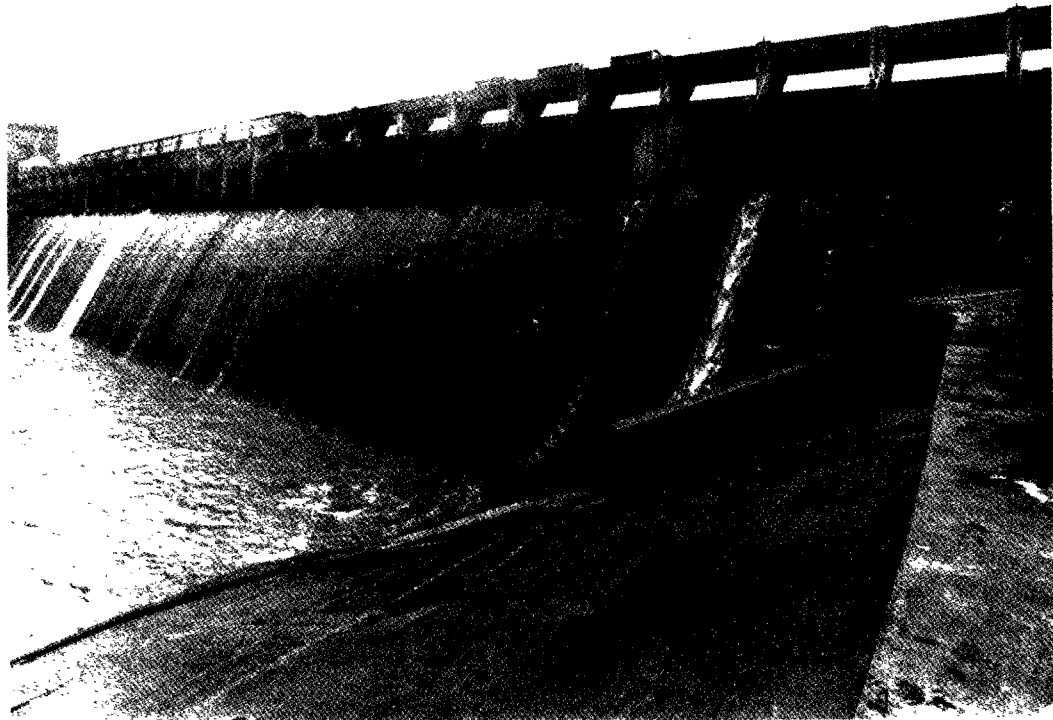
Our Hatfield's Ferry generating station is located near Masontown, Pennsylvania on the Mon about 13 miles down river from Lake Lynn. When we built this and other stations along rivers, we situated them so that a flood expected to occur not more than once every 100 years would cause no damage. At Hatfield's, the 100-year flood level was 791 feet. Water there reached about 798 feet. At Albright, the flood stage was about ten feet higher than the prediction for 100 years.

While we welcome the opportunity to present the facts about what did happen at meetings such as this, we believe the focus should be on how it can be prevented from happening again, if possible, and, should it happen again, what additional or better procedures might better serve to notify the public of the impending natural disaster.

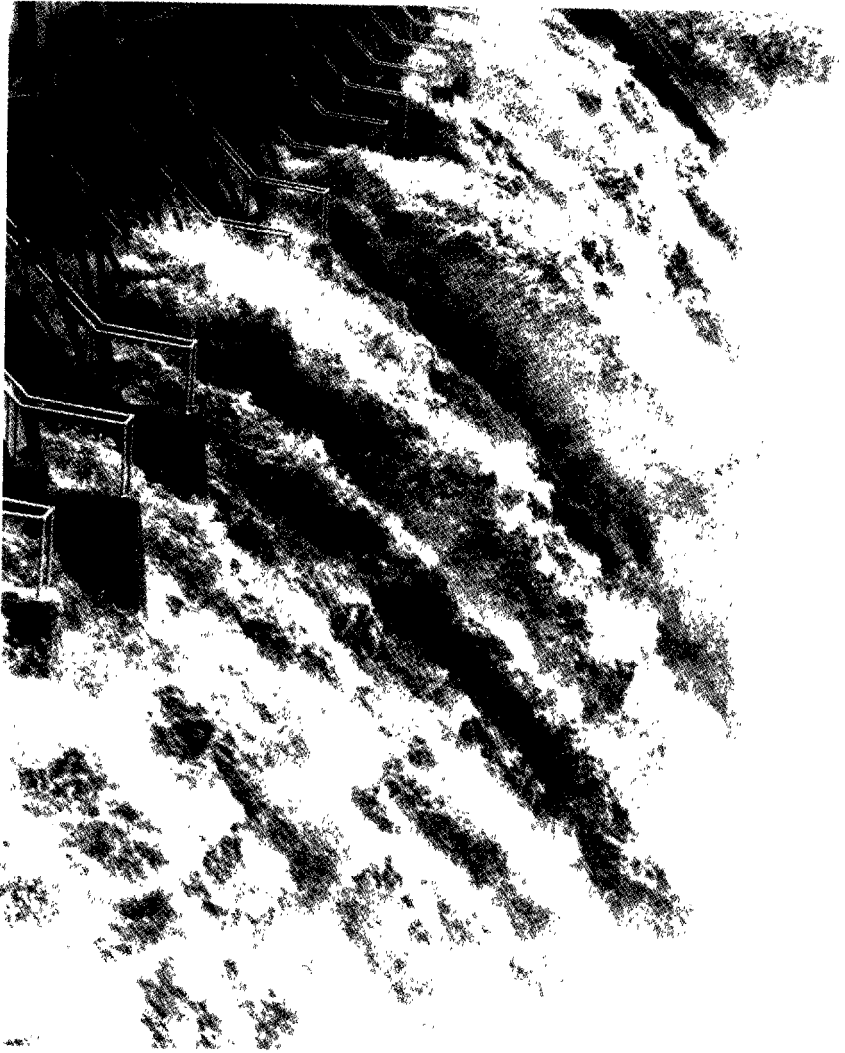
On the question of what could be done to prevent the recurrence, the answer would seem to be the construction of adequate flood control facilities on the Cheat River, and, perhaps, additional flood control facilities on the Mon, although that is an area the Corps of Engineers is more competent to address. However, although the answer appears simple, implementation of the answer is not simple, as is evidenced by the history of the Rowlesburg project. We suggest that if the Rowlesburg project cannot be built, perhaps other, less optimal but nevertheless beneficial, flood control projects could be constructed. We urge that some such project or projects be constructed as soon as feasible.

As to changes that might provide better public notification of impending floods, this is an area that is within the control and expertise of the appropriate government agencies such as the weather bureau and the emergency management agencies. Objective studies of the notification system should be undertaken by the agencies involved and appropriate recommendations made. Although our role in such matters is very limited, and secondary, we are willing to assist these agencies within the limits of our capabilities.

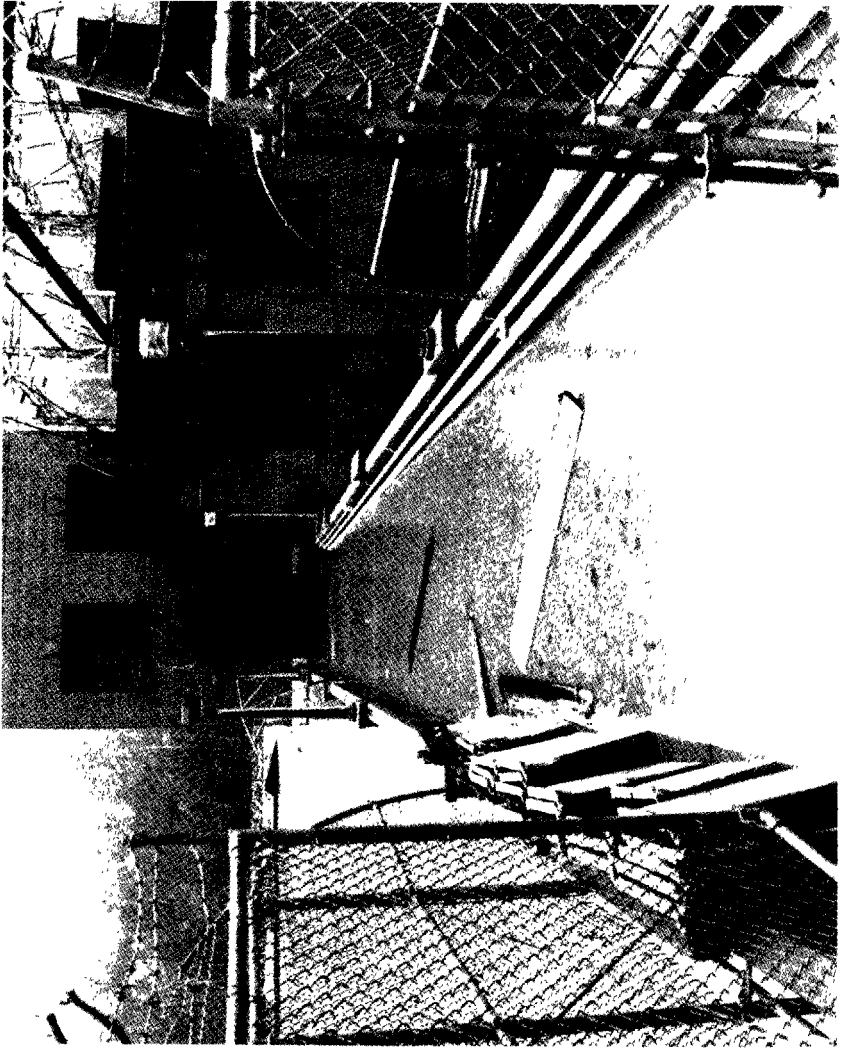
Attachment



(Photo, Nov. 5, 1985. West Penn Power Company)



(Photo, Nov. 5, 1985. West Penn Power Company)



(Photo, Nov. 5, 1985. West Penn Power Company)



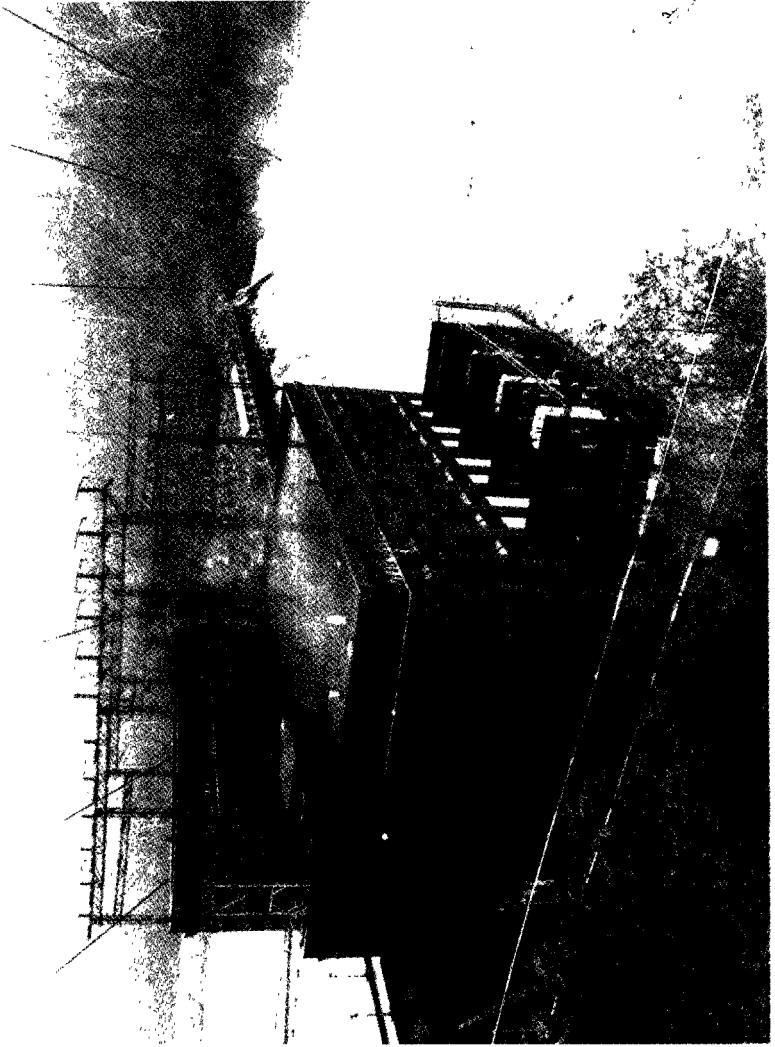
(Photo, Nov. 5, 1985. West Penn Power Company)



(Photo, Nov. 5, 1985. West Penn Power Company)



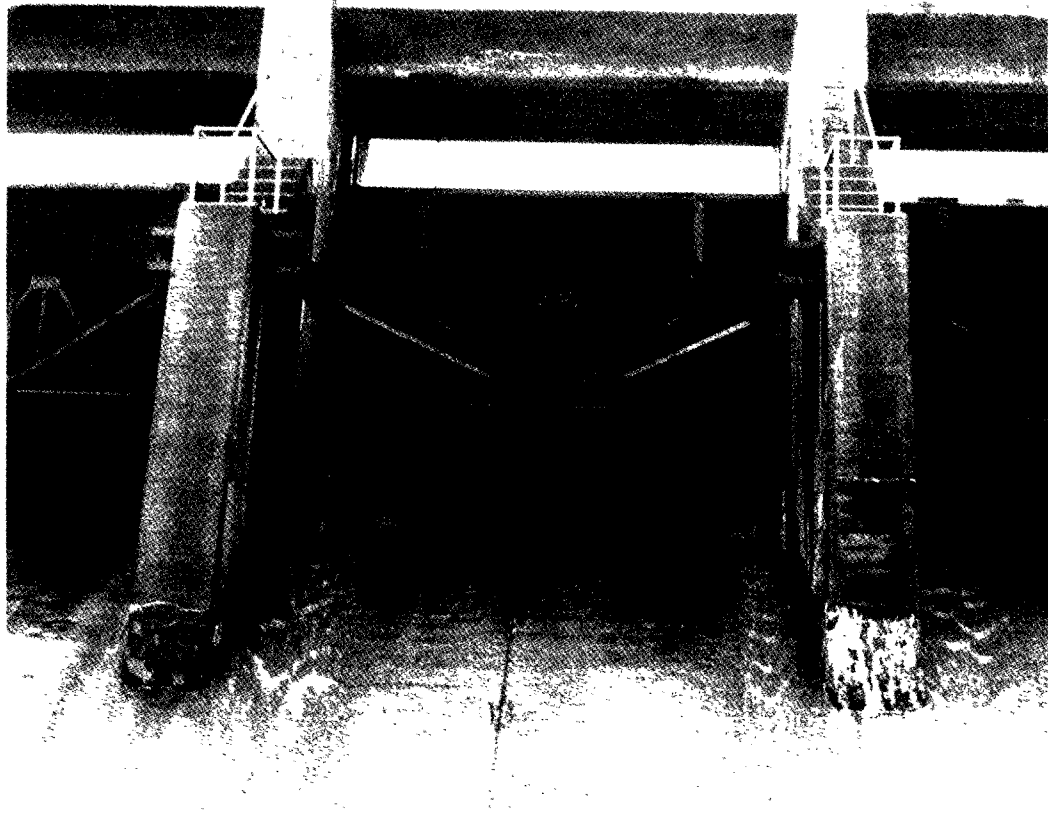
(Photo, Nov. 5, 1985. West Penn Power Company)



(Photo, Nov. 5, 1985. West Penn. Power Company)



(Photo, Nov. 6, 1985. West Penn. Power Co.)



(Photo, Nov. 20, 1985. West Penn Power Co.)

WEST PENN POWER COMPANY
GREENSBURG, PENNSYLVANIA

CHEAT RIVER BASIN FLOOD
OF 4-5 NOVEMBER 1985
POST-FLOOD INSPECTION REPORT
LAKE LYNN DAM
FERC PROJECT NO. 2459 - W.VA.

PROJECT 84-197-40

DECEMBER 1985

gai
CONSULTANTS, INC.

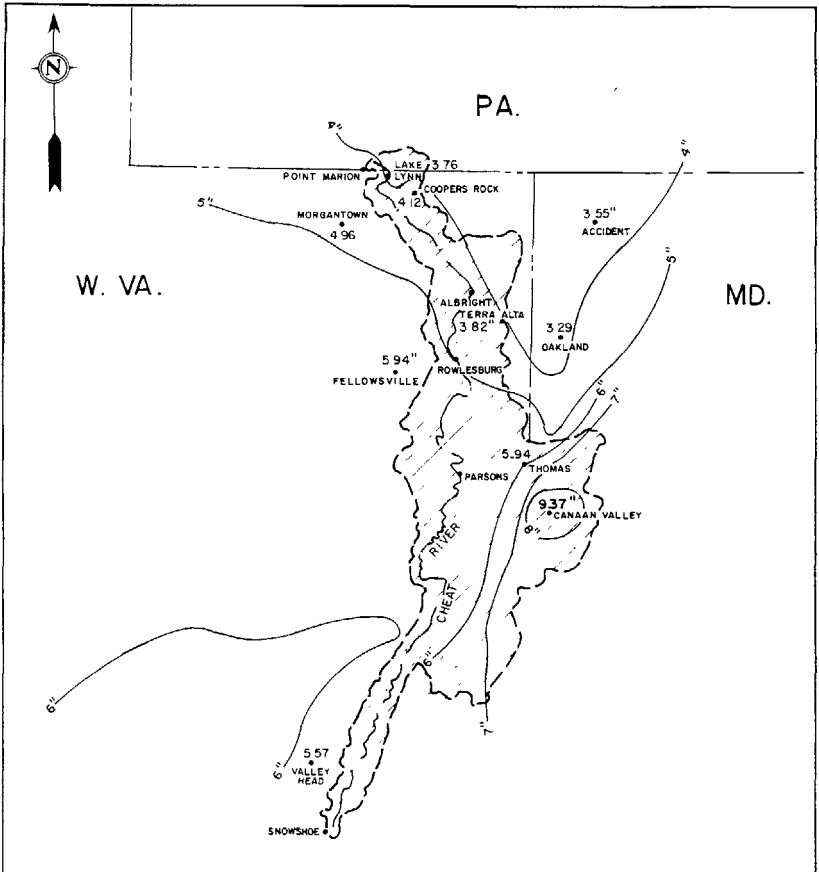
Pittsburgh, Monroeville
Pennsylvania 15146

GAI CONSULTANTS, INC

Table 5

REFERENCE PIN MEASUREMENT DATA
 UPPER GALLERY CRACKS
 LAKE LYNN DAM

Date	<u>Pin Measurements (inches)</u>	
	<u>10/11/85</u>	<u>11/10/85</u>
Pin Location #16	2.247	2.249
Pin Location #17	2.449	2.444
Pin Location #19	2.495	2.491
Pin Location #21	2.085	2.080
	<u>Temperature Data (°F)</u>	
Outside Air Temp.	66	64
Gallery Air Temp.	62	64
Water Temp.	66	51



ADOPTED FROM DRAWING SUPPLIED BY PITTSBURGH DISTRICT, CORPS OF ENGINEERS, "DAILY PRECIPITATION NETWORK, PITTSBURGH ENGINEER DISTRICT, RAINFALL FOR 7AM-3RD TO 7AM-5TH NOV 1985". (MARKED PRELIMINARY)

FIGURE 1

<p>CONSULTANTS INC</p> <p>Engineers • Geologists • Planners Environmental Specialists</p> <p>570 Reaity Rd • Pittsburgh Monroeville, Pa 15146 412-956-4400</p>	<p>RAINFALL IN AND NEAR THE CHEAT RIVER BASIN, 3-5 NOVEMBER 1985 POST FLOOD INSPECTION - LAKE LYNN DAM FERC PROJECT NO 2459-WVA</p>	<p>DWN TEJ CHKD. <i>WR</i></p>
	<p>ALLEGHENY POWER SERVICE CORPORATION</p> <p>GREENSBURG, PENNSYLVANIA</p>	<p>APPD. <i>WR</i> DATE <i>11/10/85</i></p>
	<p>SCALE. 1" = 15 MILES</p> <p>DRAWING NUMBER 84-197-A21</p>	<p>0 REV</p>

WEST PENN POWER COMPANY
GREENSBURG, PENNSYLVANIA

CHEAT RIVER BASIN FLOOD
OF 4-5 NOVEMBER 1985
POST-FLOOD INSPECTION REPORT
LAKE LYNN DAM
FERC PROJECT NO. 2459 - W. VA.

GAI CONSULTANTS, INC.
570 BEATTY ROAD
MONROEVILLE, PENNSYLVANIA 15146

PROJECT 84-197-40

DECEMBER 1985

INTRODUCTION

During the period from 3-5 November 1985, an intense rainfall associated with Tropical Storm Juan occurred within the Cheat River basin and surrounding areas. As a consequence of the rainfall, Lake Lynn Hydroelectric Project located on the Cheat River in Monongalia County, West Virginia approximately 3.6 miles upstream from its confluence with the Monongahela River, experienced a severe flood during 4 and 5 November 1985. At the request of West Penn Power Company, personnel from GAI Consultants, Inc., visited the dam site during the late afternoon of 5 November 1985 to observe the flood conditions at that time. On 8 November 1985, a two-man team returned to the project site to mark high-water levels at selected locations downstream of the dam.

This report presents the observations made by GAI Consultants, Inc., during a post-flood visual inspection of the Lake Lynn Hydroelectric Project. This inspection was performed at the request of West Penn Power Company in response to a FERC directive for an evaluation of conditions at the facility following the flood experienced at the dam. The field inspection of the project was conducted by a two-man team on 25 November 1985.

Project features observed by the team (see Figure 4 for locations) include the east and west bulkheads, the spillway, powerhouse, ancillary facilities, and reservoir and tailrace areas adjacent to the dam to determine the condition of the

facility subsequent to the flood. The observations described in this report stem from a visual inspection of the facilities as viewed from vantage points accessible during a walk-through of the project. An underwater inspection of the upstream face of the dam and the tail race facilities (spillway baffle wall and draft tube discharges) were not conducted. Due to the large amount of debris in the reservoir, a close inspection of the upstream portion of the dam near the waterline from a boat was also not conducted.

In addition to a description of the field inspection conducted, this report also presents the results of GAI's preliminary analysis of the flood magnitude based upon the hydrologic data available at the present time. A brief discussion of the rainfall depth on the Cheat River watershed, stream flow above Lake Lynn, and a preliminary estimate of the peak discharge at Lake Lynn Dam during the November 4-5, 1985 flood are described. Photographs taken by West Penn Power Company of the Lake Lynn project during and after the flood are presented for pictorial documentation of conditions similar to those observed by GAI personnel on 5 and 8 November 1985.

PRELIMINARY HYDROLOGIC AND HYDRAULIC ANALYSIS OF FLOOD OF
4-5 NOVEMBER 1985 ON THE CHEAT RIVERRainfall

Lake Lynn Dam and Reservoir is located 3.6 miles above the mouth of the Cheat River. A 1413 square-mile drainage area exists above the dam and is primarily situated in the State of West Virginia with a minor portion in Pennsylvania. During the period from 3-5 November, an intense storm associated with Tropical Storm Juan struck the Cheat River basin and surrounding regions in West Virginia, Maryland and Virginia.

According to preliminary data received from the U.S. Army Corps of Engineers the greatest reported depth of rainfall within the Cheat River watershed was 9.37 inches at Canaan Valley, West Virginia for the period from 0700 hours to 0700 hours on 3-5 November. (Source: U.S. Army Corps of Engineers, Pittsburgh District, Daily Precipitation Reporting Network, Rainfall from 7am 3rd to 7am 5th of November - Preliminary). Other readings from the Corps of Engineers in and around the Cheat River basin for the same time period were:

5.57"	Valley Head, WV
5.94"	Thomas, WV
5.94"	Fellowsville, WV
3.29"	Oakland, MD
3.82"	Terra Alta, WV
4.96"	Morgantown, WV
3.55"	Accident, MD
4.12"	Coopers Rock, WV
3.76"	Lake Lynn Dam

Isopluvial contours are shown on Figure 1. It is apparent that the greatest rainfall depths occurred in the headwaters of the basin, particularly on the eastern side which is drained by

the Blackwater River. Average depths of rainfall across the entire drainage basin were about 4.9 inches and about 6.1 inches for that portion of the drainage basin above Rowlesburg, West Virginia.

Stream Flow Above Lake Lynn Dam

The United States Geological Survey (USGS) has maintained a continuous recording gage at Parsons, West Virginia from January 1913 to the present. The drainage area at the gage is 718 square miles and flood stage is 13 feet. Prior to this flood, the maximum recorded stage was 19.08 feet (52,100 cfs) which occurred on 15 October 1954. Between 2100 and 2200 hours on 4 November 1985 the gage at Parsons was washed away after rising from a stage of 9.5 feet to 19.5 feet in about five hours. The river was still rising at the time the gage was washed away. The estimated maximum stage was 23.8 feet during the early morning hours of 5 November according to information supplied by the Pittsburgh District of the Corps of Engineers, and the Charleston Office of the USGS.

All other stream gages in the Cheat River basin that were maintained by the USGS or the Corps of Engineers were lost during this flood.

Flood Passage at Lake Lynn Dam

Based on the strip chart recorder, the reservoir at Lake Lynn began a sustained rise starting around 1800 hours on 4 November with the pool at Elevation 866.1 feet. By 1930 hours, gate operations began in response to the developing flood on the

Cheat River. By 0555 hours on 5 November, Gates 1 to 24 were fully opened and Gates 25 and 26 were partially open to approximately seven feet each. The reservoir was at Elevation 869.6 feet at 0600 hours on 5 November and was beginning to rise more rapidly. Gates 25 and 26 were only partially opened to control erosion and scour of the left bank below the spillway apron. The actual gate operations are summarized on Table 1. Flood alert stages are summarized on Table 2.

As the water continued to rise Unit 4 at the power station tripped off at about 0900 hours because of an electrical problem. Units 1, 2 and 3 were then shut down by station personnel. As personnel were no longer needed, the plant was evacuated between 0905 and 1020 hours on 5 November. High water marks obtained at the station after the flood show that the reservoir pool reached a maximum elevation of 876.5 feet. Station personnel afterwards estimated that the maximum reservoir pool occurred near 1030 hours on 5 November. Station personnel manually measured a reservoir elevation of 870.98 feet at 1715 hours on 5 November. A similar manual reading at 1915 hours was 868.50 feet.

The tailwater recorder appears to have functioned throughout the flood and reached a maximum elevation of 820.1 feet at about 1200 hours on 5 November. High water marks obtained after the flood within the powerhouse were near 821 feet.

Figure 2 illustrates the reservoir pool elevations at Lake Lynn and the earlier rise of the river at Parsons, WV. Figure 3

displays reservoir pool and tailwater elevations at Lake Lynn Dam. Table 3 summarizes reservoir pool and tailwater elevations at Lake Lynn Dam and river stages at the Parsons gage.

Based on the spillway rating curve adopted for previous studies of Lake Lynn Dam, for a maximum pool elevation of 876.5 feet with all gates open, the peak discharge over the spillway should be approximately 150,000 cfs.

The Corps of Engineers, in their studies for the Rowlesburg Reservoir, developed a unit hydrograph for the Cheat River at the Lake Lynn site. A hydrograph is a trace of flood discharge versus time at a point along the stream. A unit hydrograph represents the passage of a flood at a given point over a period of time in response to one-inch of runoff from the contributing watershed. Using this concept, flood hydrographs that would occur from storms with other runoff depths can be obtained by simple multiplication. For instance, if a particular storm generated three inches of runoff over a period of time similar to the duration of the unit hydrograph, the actual flood hydrograph would have flows three times as great as those of the unit hydrograph at each point in time (three inches of runoff times the one-inch hydrograph values). The aforementioned unit hydrograph at Lake Lynn Dam has a maximum discharge of 30,400 cfs for one-inch of runoff in the Cheat River basin above the dam. Assuming this unit hydrograph is correct and assuming that the peak spillway flow was 150,000 cfs and assuming this equalled the peak flow into the reservoir, this flow would represent $150,000/30,400$, or 4.93 inches of runoff. As already described,

the preliminary rainfall records indicate that about 4.9 inches of rainfall fell over the entire watershed. Not all of this would have reached the streams as runoff because of infiltration losses into the ground, but there is reasonable agreement between the predicted spillway flow and the amount of rainfall needed to cause it. The trash build up near the spillway taintor gates could have reduced this capacity by a few percent which would lead to an even closer agreement between rainfall and peak flows.

Post-Flood Operations

A large amount of debris was washed into the reservoir by the flood which prevented closure operation of the gates until it was removed. The debris was cleared from around the gates by 10 November and between 1345 and 1405 hours the gates were again closed with the pool elevation in the vicinity of 855.3 feet.

PHOTOGRAPHS OF LAKE LYNN DAM
DURING THE FLOOD

Photographs 1 through 6 were provided by West Penn Power Company and were taken while the flood level was at or near the peak discharge. Photographs 1 and 2 provide overviews of the hydroelectric facility showing the reservoir and tailrace, respectively, as viewed from the hillside upslope of the east abutment of the dam (note the large amount of debris retained in the reservoir behind the spillway gates). Photograph 3 shows the reservoir level at or near the peak discharge. At the crest of the flood, the deck of the East Bulkhead was covered by approximately 2.5 feet of water, leaving about 0.7 feet of freeboard to the top of the parapet walls. Photograph 4 was taken inside the upper floor level of the Powerhouse. This floor level was inundated with approximately 30 inches of water which, subsequently, spilled onto the deck of the East Bulkhead through the door shown in Photograph 3. The tailwater level at approximately the peak discharge is shown in Photographs 5 and 6. Water flooded the machine shop level of the Powerhouse through a submerged door below the windows shown in Photograph 6. The machine shop (which is at approximately Elevation 811) was inundated with about 10 feet of water and the lower inspection gallery was flooded due to water entering through the machine shop.

Photographs 7 and 8 depict the debris accumulated against the spillway portion of the dam and below the East Bulkhead, respectively. These photographs were taken subsequent to the

Flood and prior to the start of any clean-up operations. (Note, Photographs 9 through 24 were taken during the field inspection trip on 25 November 1985 and are described in the next section of this report.)

POST-FLOOD FIELD INSPECTION

General Assessment

The overall condition of the project works is considered to be good. Based on observations made during the 25 November 1985 field inspection, no significant damage that would threaten the safety of the dam resulted from the flood.

Discussions with the Station Superintendent indicate that no serious problems were encountered during the opening of the spillway gates as the flood occurred. The clutch in the hoist mechanism for Gate 11 failed during its operation, but the gate was opened without substantial delay using a backup hoist system and no substantial damage to the gate was sustained. Spillway Gates 25 and 26 were only partially opened (as described earlier in the discussion of the hydrology and hydraulics) to limit erosion downstream of the west abutment of the dam. Finally the spillway gates could not be closed for several days after the flood until sufficient debris had been removed from between the spillway piers.

West Abutment and Bulkhead

The west abutment and bulkhead is considered to consist of the non-overflow section to the left (looking downstream) of Gate No. 26 and the mass concrete section downstream of spillway chutes below Gates 23 through 26.

Visual inspection of the West Bulkhead did not reveal any substantial changes in the structural condition of the concrete in the non-overflow section. The epoxy filled cracks on the

upstream side of the dam (Photograph 9) showed no evidence of cracking in the epoxy or at the epoxy concrete interface.

Minor seepage was observed exiting the rock surface on the downstream side of the West Bulkhead. This condition, while not mentioned in the previous safety inspection report, (Third Safety Inspection, Lake Lynn Dam, FERC Project No. 2459-WVA, July 1982 by GAI Consultants, Inc.) has been observed during prior site visits and does not reflect a change in conditions due to the flood. A large block of rock has been loosened/partially eroded from the rock wall immediately to the left of the stairway adjacent to Spillway Gate 26 (see Photograph 10). The rock was apparently loosened by the discharge through the portal in the West Bulkhead. It could not be determined, from visual inspection of the rock block or from review of available drawings, if the base of the loosened rock mass extends to the foundation level of the concrete bulkhead.

Photograph 11 shows the mass concrete section downstream of Spillway Gates 23 through 26. Spalling of the concrete surface was observed on the vertical diversion wall and the floor slab of the spillway discharge chute located below Gates 23 through 26. This spalling was not observed during the 1982 safety inspection and may be the result of abrasion/erosion during the high discharge of the flood.

A portion of the shotcrete cover placed on the slope above a grout-filled bag revetment immediately downstream of the mass concrete section (see Photograph 17) has been broken off and folded back over the remaining shotcrete. The 1982 inspection

report described some undercutting of this shotcrete and the water turbulence against the shotcrete during the flood evidently resulted in this damage. However, the loss of this shotcrete surface appears inconsequential to the overall integrity of the slope at this location.

Spillway and Trash Chutes

Overall, the condition of the spillway surface is considered good. Vertical cracks in the concrete surface were typically observed at vertical construction joints across the length of the spillway (Photograph 12 shows one such crack located between Gates 21 and 22). In addition, horizontal cracks in the concrete surface overlay of the spillway were observed over the major portion of the spillway. Photograph 13 shows a typical horizontal cracking condition noted below Gate 2 of the spillway. However, these cracking conditions are not considered significant to the performance or maintenance of the spillway at the present time and are considered unrelated to the flood.

At the time of the inspection, many of the spillway gates exhibited some leakage around the vertical and horizontal seals (as may be observed in Photograph 17). The most significant leakage conditions were observed for Gates 6, 7, 8, 11, 24 and 26 (see Figure 4 for gate locations). Photograph 14 shows the leakage condition at the left (looking upstream) vertical seal of Gate 24 and Photograph 15 depicts leakage from both the vertical and base (horizontal) seals of Gate 6. According to the station superintendent, the spillway gates could not be closed until

November 10, 1985 following the flood because of debris in the gate chambers. Based on the amount of debris remaining in the reservoir (see Photographs 18 and 24) against the gates, it is likely that much of the leakage observed is caused by debris still caught in the seals. An evaluation of damage to the seals should be conducted once the reservoir has been cleared of debris.

No structural damage to the spillway gates, trunions or supports (other than the bent member in Gate 10 mentioned in previous safety inspection reports) was observed. Gate 11 was dropped suddenly during its operation during the flood as a result of the failure of the clutch mechanism on the gate hoist. However, no visible structural damage to the gate was observed. Leakage around the seals was most severe at this gate, indicating that perhaps some damage to the seals as a result of the clutch failure and the gate dropping may have occurred.

No significant changes in the condition of the trash chutes were apparent since the last safety inspection. The flow surfaces downstream of the two trash gates and their associated side walls are in good condition.

Powerhouse

Photographs 16 and 17 present views of the Powerhouse from the downstream side and Photograph 18 presents a view from upstream. Based on the visual inspection, the structural conditions within the Powerhouse are good, exhibiting no structural distress or cracking. As mentioned previously, the

machine shop and upper floor of the powerhouse were inundated during the flood. However, debris had been removed prior to the field inspection and no visible damage as a result of the flooding was observed. High water marks noted on the walls of the building indicate that approximately 30 inches of water had been on the upper floor (corresponding to a maximum flood reservoir elevation of about 876.5 feet) and the machine shop had experienced a water depth of about 10 feet above the floor (corresponding to a maximum flood tailwater elevation of about 821 feet). The high water mark measurement taken in the machine shop differs somewhat from the maximum reading of 820.1 feet obtained from the tailwater strip chart recorder.

Both the reservoir and tailwater recorders appeared to be functioning at the time of the field inspection. No efforts on the part of the inspection team were made to determine the accuracy of the recorders at the time of the inspection.

East Bulkhead and Abutment

No damage was observed at the East Bulkhead or Abutment as a result of the flooding. Photographs 18, 19, and 20 provide views of the upstream face, downstream face, and crest of the East Bulkhead, respectively.

Inspection Galleries

Lower Gallery. Conditions within the lower (main) inspection gallery appear similar to the conditions described in the 1982 safety inspection report. No evidence of flood related cracking or seepage was apparent.

Water level readings and depth soundings were made in the foundation borings installed in the lower gallery since the last safety inspection. This data is summarized in Table 4 and approximate boring locations are shown in Figure 4. The borings are capped to prevent debris from entering them and, for most of the borings, the sounded depth agrees well with the installed depth. Borings BH-12, -14, and -19 have 2.4 to 4.3 feet of debris in the base of the borings. However, all of these borings are still open to a depth below the base of the concrete foundation and are functioning as a measure of the uplift pressure on the base of the dam. Boring BH-17 is partially obstructed at a depth of about 19.3 feet (15.4 feet above its base), but also appeared to be giving water level readings which are consistent with the adjacent Borings BH-18 and BH-19. The cap for Boring BH-4 in the lower gallery of the East Bulkhead is missing and the boring is filled with silt.

Upper Gallery. Conditions in the upper (pipe) gallery also appear to be unchanged from the time of the last safety inspection. The concrete is in good condition. Calcium deposition was observed, as before, at vertical construction joints and along an apparent horizontal construction joint near the east end of the gallery. Seepage and calcium deposition was also noted at the west end of the upper gallery at the top of the stairs leading to the lower (main) gallery.

The relatively large horizontal cracks noted in the upper gallery in previous reports were observed. On the upstream side of the gallery the crack extends from Gate 14 to Gate 24 and on

the downstream side from Gate 7 to Gate 25. Reference pin measurements for the crack were recorded by employees of West Penn Power Company on 11 October 1985 (prior to the 4 November 1985 flood) and again on 10 November 1985 following the flood. The recorded pin measurements are listed in Table 5. As may be observed from an examination of the data, there is no significant change in the crack width due to the occurrence of the flood.

Ancillary Facilities

Photograph 16 shows the parking area located downstream of the East Bulkhead portion of the dam. The asphalt pavement was eroded when the flooding occurred. As shown in Photographs 16, 22, and 23, the parking area has been repaired by placement of crushed stone. Rip rap has been installed along the riverside edge of the parking lot. The concrete slope revetment shown in Photograph 22 was undercut by the flood waters and, subsequently, backfilled with crushed stone (as seen in the photograph).

In addition, erosion at the toe of the slope on the uphill side of the parking area combined with the high rainfall resulted in the small surficial landslide shown in Photograph 21. The slide material has been removed to expose underlying rock and it is not anticipated that additional sliding will occur.

Reservoir

Photographs 18 and 24 show the upstream face of the dam and the massive amount of debris that accumulated in the reservoir as a result of the flood. At the date of the inspection, removal of the debris from the reservoir was not yet in progress. As

indicated by West Penn Power Company personnel, they are complying with the Corps of Engineers request that the massive accumulation of debris not be released through the trash chutes since the Cheat River discharges into the navigable Monongahela River and such a discharge could create problems at downstream locks and dams. Debris removal is being coordinated with the U.S. Army Corps of Engineers utilizing their contractor.

No reservoir conditions were observed that could be considered detrimental to the safety of the dam. However, the debris present in the reservoir could create difficulties relative to spillway gate operation (closing but not opening) until its removal is completed.

Tailrace

The tailrace area below Lake Lynn Dam is shown in Photograph 17. The river channel immediately downstream of the dam was observed to be free of debris and obstructions.

The riverbank downstream of the west abutment is steep and a landslide exists on the channel slope just upstream of the small island present at midchannel. However, the landslide does not threaten any of the dam's facilities and does not appear to involve enough land-mass to present a potential threat as a channel obstruction.

CONCLUSIONS AND RECOMMENDATIONS

Overall, based on the post-flood field inspection conducted by GAI Consultants, Inc., on 25 November 1985, Lake Lynn Dam is considered to be in good condition and to have experienced only minor damage as a result of the flooding that occurred on the Cheat River during the period from 4-5 November 1985. The field inspection consisted of a visual reconnaissance of the plant facilities that could be reached by walking. An underwater inspection of the upstream face of the dam and the tailrace facilities (spillway baffle wall and draft tube discharges) were not conducted. Due to the large amount of debris in the reservoir, a close inspection of the upstream portions of the dam near the waterline from a boat was also not conducted.

The following minor damage to or deterioration of the dam was noted and recommendations are presented:

1. A loose block of rock (Photograph 10) was observed at the downstream edge of the West Bulkhead. The rock mass should be removed to determine if it extends to the base of the foundation of the concrete section.
2. Some abrasion/spalling exists on the vertical diversion wall of the concrete mass downstream of spillway Gates 23 through 26 and on the floor slab of the spillway surface below Gate 23 (see Photograph 11). This deterioration should be repaired as part of the dam's routine maintenance.

3. Minor seepage was observed around the seals of several of the spillway gates. The damage to the seals should be evaluated once all of the debris caught in the gates has been removed. If necessary, the seals should be repaired as part of the regular maintenance of the dam.
4. Minor horizontal cracking was observed in the spillway surface overlay and vertical cracking at construction joints was observed. Changes in these conditions from the present should be noted in the next safety inspection.
5. An extensive amount of debris was observed in the reservoir and against the spillway portion of the dam (see Photographs 18 and 24). Removal of the debris will be accomplished by a contractor retained by the Corps of Engineers.
6. Boring BH-4 in the lower gallery of the East Bulkhead is filled with silt and Boring BH-17 in the spillway is obstructed. Both borings should be flushed of debris, and the cap for Boring BH-4 should be replaced.
7. Landslides exist above the parking area downstream of the East Bulkhead (Photograph 21) and downstream of the West Abutment. Neither landslide appears to present a threat to the dam's facilities.
8. The shotcrete slope protection above the grout bag revetment (downstream of the concrete mass at the far end of the spillway gates in Photograph 17) has been partially removed by the flood discharge. However, its

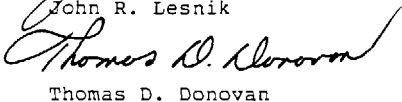
loss is considered inconsequential to the integrity of the slope at this location.

9. An underwater inspection of the upstream and downstream portions of the dam's facilities should be conducted as part of the next safety inspection. Soundings should be made downstream of the spillway baffle wall and the turbine draft tube discharge area to check for scour.

Respectfully submitted,
GAI Consultants, Inc.


R. Al Bragg


John R. Lesnik


Thomas D. Donovan

RAB:JRL:TDD/llm

TABLE 1

111

TIME FOR
NOV. 4-5 FLOOD

SCHEME OF GATE OPERATIONS AT LAKE LYNN DAM

DATE	TIME	GATE NO.	GATE OPENING IN FEET FOR RAISES IN 10 ...																									
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
			<div style="display: flex; flex-wrap: wrap;"> <div style="width: 33%;"><p>4 NOV</p></div> <div style="width: 33%;"><p>1934 1-2</p></div> <div style="width: 33%;"><p>1935 3-4</p></div> <div style="width: 33%;"><p>1940 5-6</p></div> <div style="width: 33%;"><p>1945 7-8</p></div> <div style="width: 33%;"><p>1950 9-10</p></div> <div style="width: 33%;"><p>2005 11-12</p></div> <div style="width: 33%;"><p>2020 13-14</p></div> <div style="width: 33%;"><p>2025 15-16</p></div> <div style="width: 33%;"><p>2035 17-18</p></div> <div style="width: 33%;"><p>2045 19-20</p></div> <div style="width: 33%;"><p>2060 21-22</p></div> <div style="width: 33%;"><p>2065 23-24</p></div> <div style="width: 33%;"><p>2070 25-26</p></div> <div style="width: 33%;"><p>2100 27-28</p></div> <div style="width: 33%;"><p>2105 29-30</p></div> <div style="width: 33%;"><p>2110 31-32</p></div> <div style="width: 33%;"><p>2120 33-34</p></div> <div style="width: 33%;"><p>2130 35</p></div> <div style="width: 33%;"><p>2140 37-38</p></div> <div style="width: 33%;"><p>2145 39-40</p></div> <div style="width: 33%;"><p>2150 41-42</p></div> <div style="width: 33%;"><p>2155 43-44</p></div> <div style="width: 33%;"><p>2200 45-46</p></div> <div style="width: 33%;"><p>2205 47-48</p></div> <div style="width: 33%;"><p>2210 49-50</p></div> <div style="width: 33%;"><p>2215 51-52</p></div> <div style="width: 33%;"><p>2220 53-54</p></div> <div style="width: 33%;"><p>2225 55-56</p></div> <div style="width: 33%;"><p>2230 57-58</p></div> <div style="width: 33%;"><p>2235 59-60</p></div> <div style="width: 33%;"><p>2240 61-62</p></div> <div style="width: 33%;"><p>2245 63-64</p></div> <div style="width: 33%;"><p>2250 65-66</p></div> <div style="width: 33%;"><p>2255 67-68</p></div> <div style="width: 33%;"><p>2300 69-70</p></div> <div style="width: 33%;"><p>2305 71-72</p></div> <div style="width: 33%;"><p>2310 73-74</p></div> <div style="width: 33%;"><p>2315 75-76</p></div> <div style="width: 33%;"><p>2320 77-78</p></div> <div style="width: 33%;"><p>2325 79-80</p></div> <div style="width: 33%;"><p>2330 81-82</p></div> <div style="width: 33%;"><p>2335 83-84</p></div> <div style="width: 33%;"><p>2340 85-86</p></div> <div style="width: 33%;"><p>2345 87-88</p></div> <div style="width: 33%;"><p>2350 89-90</p></div> <div style="width: 33%;"><p>2355 91-92</p></div> <div style="width: 33%;"><p>0000 93-94</p></div> <div style="width: 33%;"><p>0005 95-96</p></div> <div style="width: 33%;"><p>0010 97-98</p></div> <div style="width: 33%;"><p>0015 99-100</p></div> <div style="width: 33%;"><p>0020 101-102</p></div> <div style="width: 33%;"><p>0025 103-104</p></div> <div style="width: 33%;"><p>0030 105-106</p></div> <div style="width: 33%;"><p>0035 107-108</p></div> <div style="width: 33%;"><p>0040 109-110</p></div> <div style="width: 33%;"><p>0045 111-112</p></div> <div style="width: 33%;"><p>0050 113-114</p></div> <div style="width: 33%;"><p>0055 115-116</p></div> <div style="width: 33%;"><p>0100 117-118</p></div> <div style="width: 33%;"><p>0105 119-120</p></div> <div style="width: 33%;"><p>0110 121-122</p></div> <div style="width: 33%;"><p>0115 123-124</p></div> <div style="width: 33%;"><p>0120 125-126</p></div> <div style="width: 33%;"><p>0125 127-128</p></div> <div style="width: 33%;"><p>0130 129-130</p></div> <div style="width: 33%;"><p>0135 131-132</p></div> <div style="width: 33%;"><p>0140 133-134</p></div> <div style="width: 33%;"><p>0145 135-136</p></div> <div style="width: 33%;"><p>0150 137-138</p></div> <div style="width: 33%;"><p>0155 139-140</p></div> <div style="width: 33%;"><p>0200 141-142</p></div> <div style="width: 33%;"><p>0205 143-144</p></div> <div style="width: 33%;"><p>0210 145</p></div> <div style="width: 33%;"><p>0215 146</p></div> <div style="width: 33%;"><p>0220 147</p></div> <div style="width: 33%;"><p>0225 148</p></div> <div style="width: 33%;"><p>0230 149</p></div> <div style="width: 33%;"><p>0235 150</p></div> <div style="width: 33%;"><p>0240 151</p></div> <div style="width: 33%;"><p>0245 152</p></div> <div style="width: 33%;"><p>0250 153</p></div> <div style="width: 33%;"><p>0255 154</p></div> <div style="width: 33%;"><p>0300 155</p></div> <div style="width: 33%;"><p>0305 156</p></div> <div style="width: 33%;"><p>0310 157</p></div> <div style="width: 33%;"><p>0315 158</p></div> <div style="width: 33%;"><p>0320 159</p></div> <div style="width: 33%;"><p>0325 160</p></div> </div>																									

- SOURCE: LAKE LYNN STATION DATA, ALLEGHENY POWER SYSTEM, 12 APRIL 1966.
- DURING THE 4-5 NOVEMBER FLOOD ON THE CHEAT RIVER, THE NORMAL SCHEDULE WAS MODIFIED AS FOLLOWS ACCORDING TO INFORMATION SUPPLIED BY THE STATION MANAGER.

GATE OPERATION NUMBER	DAYS	SCHEDULED OPENING (FEET)	ACTUAL OPENING (FEET)	*TABLE 1, RELEASE 1-28-86
157	23	0	13	BEHIND 0-20 AM AND 7:30 AM GATES
158	24	0	3	THROUGH 24 INCLUSIVE
159	25	6	7	HEAVY FLEETING RAISES
160	26	11	7	TO 2M OPENING OF ABOUT 10 1/2 FEET

3. THE MAIN GATES WERE ALSO FULLY OPENED DURING THE FLOOD BUT THE TIMES WERE NOT RECORDED.

GAI CONSULTANTS, INC.

Table 2

LAKE LYNN DAM
FEDERAL ENERGY REGULATORY COMMISSION WARNING
AND EVACUATION PLAN
NOTIFICATIONS GIVEN UNDER PLAN
NOVEMBER 4 THROUGH 10, 1985^(1, 2)

First Stage Alert

Fayette County Emergency Management Agency. At 2217 hours on November 4, Mr. Lance Winterhalter was called. Winterhalter was not in at the time but returned the call at 2233 hours on November 4.

Greene County Emergency Management Agency. At 2219 hours on November 4, Sergeant Mitchell (Greene County Jail) was notified.

Second Stage Alert

Fayette County Emergency Management Agency. At 2323 hours on November 4, Mrs. Winterhalter was notified.

Greene County Emergency Management Agency. At 2326 hours on November 4, Herb McCabe was notified (Greene County Jail).

Third Stage Alert

Fayette County Emergency Management Agency. At 0035 hours on November 5, Mr. Winterhalter was notified.

Greene County Emergency Management Agency. At 0044 hours on November 5, the Green County Jail was notified.

Federal Energy Regulatory Commission. At 0053 hours on November 5, Mr. Anton Sidoti was notified.

Fourth Stage Alert

Fayette County Emergency Management Agency. At 0204 hours on November 5, Mr. Mellors was notified.

Greene County Emergency Management Agency. At 0205 hours on November 5, Mr. Yoders was notified.

Federal Energy Regulatory Commission. At 0208 hours on November 5, Mr. Sidoti was notified.

GAI CONSULTANTS, INC.
Table 2 (continued)Downgrade to Third Stage Alert

Fayette County Emergency Management Agency. At 1344 hours on November 7, Ms. Debbie Sharon was notified.

Greene County Emergency Management Agency. At 1345 hours on November 7, Mr. Wayne Long was notified.

Federal Energy Regulatory Commission. (Regional Engineer) At 1348 on November 7, Ms. Rebecca Debes was notified.

Downgrade to Second Stage Alert

Fayette County Emergency Management Agency. At 2000 hours on November 7, there was no answer.

Greene County Emergency Management Agency. At 2000 hours on November 7, Mr. Yoders was notified.

Downgrade to Normal

Fayette County Emergency Management Agency. At 1425 hours on November 10, there was no answer.

Fayette County Emergency Management Agency. At 0805 hours on November 12, Naomi (no last name given) was notified.

Greene County Emergency Management Agency. At 1425 hours on November 10, Mr. Broch was notified.

- (1) This information was provided to GAI by West Penn Power Company personnel.
- (2) This information was taken by West Penn Power Company personnel from logs and tapes from the West Penn Power Transmission and Distribution Center.

Project 84-197-40

Table 3

LAKE LYNN RESERVOIR AND TAILWATER ELEVATIONS
AND
RIVER STAGES AT THE PARSONS, WEST VIRGINIA GAGE
Flood of 4-5 November 1985 on the Cheat River

<u>Date</u>	<u>Time</u>	<u>Recorded Lake Lynn Reservoir Pool Elevation (a)</u>	<u>Recorded Lake Lynn Tailwater Elevation (d)</u>	<u>Stage at Parson, WV Gage (f)</u>
4 Nov	800			6.00
				6.18
	1000			6.56
				6.81
	1200			6.94
				7.06
	1400			7.37
				8.06
	1600			9.50
				11.72
5 Nov	1800	866.1	788.2	14.08
		866.2	788.2	15.75
	2000	866.4	789.6	18.00
		866.6	792.0	19.50(g)
	2200	866.9	795.0	
		867.3	797.5	
	2400	867.8	799.4	
		868.3	801.6	
	200	868.6	804.2	
		868.6	805.8	
	400	868.9	806.7	
		869.2	809.0	
	600	869.6	811.2	
		870.7	813.1	
	800	(b)	815.4	
		(b)	817.3	
	1000	(b)	818.6	
		(c)	819.8	
	1200	(b)	820.1(e)	
		(b)	819.8	
1400	(b)	819.2		
	(b)	818.2		
1600	(b)	817.2		
	(b)	816.0		
1800	(b)	815.2		

- (a) These elevations were read from a copy of the strip chart from the reservoir pool recorder by GAI, which can be accurately read to within one tenth of a foot.
- (b) Reservoir pool elevations after 0700 hours on 5 November are not reported since West Penn Power Company personnel indicated that the chart recorder was malfunctioning and hence the readings are suspect or inaccurate.
- (c) The estimated maximum reservoir pool elevation was 876.5 feet from measured high water marks.
- (d) These elevations were read from a copy of the strip chart from the tailwater recorder by GAI, which can be accurately read to within one tenth of a foot.
- (e) The estimated maximum tailwater elevation was 821 feet from measured high water marks.
- (f) The stage readings at the Parsons, WV, gage were recorded on the Power Control Hydro Log supplied by West Penn Power Company.
- (g) The last recorded Parsons stage reading was 19.50 feet. The estimated maximum stage reading at Parsons, WV, was 23.8 feet during the early morning hours of 5 November according to information supplied by the Pittsburgh District of the Corps of Engineers and the Charleston, WV, Office of the USGS.

GAI CONSULTANTS, INC

Table 4

SUMMARY OF WATER LEVEL READINGS AND
DEPTH SOUNDINGS IN FOUNDATION BORINGS

Standpipe No.	Location	Water Elevation (ft)	Depth to Bottom (ft)	Installed Depth (ft)	Thickness of Debris (ft)
BH-4	East Bulkhead	-	0.0	20.4	20.4
BH-5	East Bulkhead	789.2	18.4	19.0	0.6
BH-6	East Bulkhead	791.0	18.6	19.2	0.6
BH-7	East Bulkhead	790.3	19.2	19.5	0.3
BH-8	Powerhouse	786.3	45.4	46.0	0.6
BH-9	Powerhouse	786.5	23.4	23.5	0.1
BH-10	Powerhouse	790.6	24.1	24.8	0.7
BH-12	Spillway	790.3	25.1	28.2	3.1
BH-14	Spillway	784.5	50.6	53.0	2.4
BH-15	Spillway	786.1	31.2	32.8	1.6
BH-16	Spillway	785.0	28.9	29.2	0.3
BH-17	Spillway	786.4	19.3	34.7	15.4
BH-18	Spillway	784.6	48.7	53.0	4.3
BH-19	Spillway	784.6	29.9	30.0	0.1
BH-20	West Bulkhead	833.6	47.5	48.0	0.5
BH-21	West Bulkhead	835.4	20.5	20.6	0.1

- Notes: 1) Tailwater elevation at time of readings was 785.9 feet
2) Reservoir pool elevation at time of readings was 861.3 feet

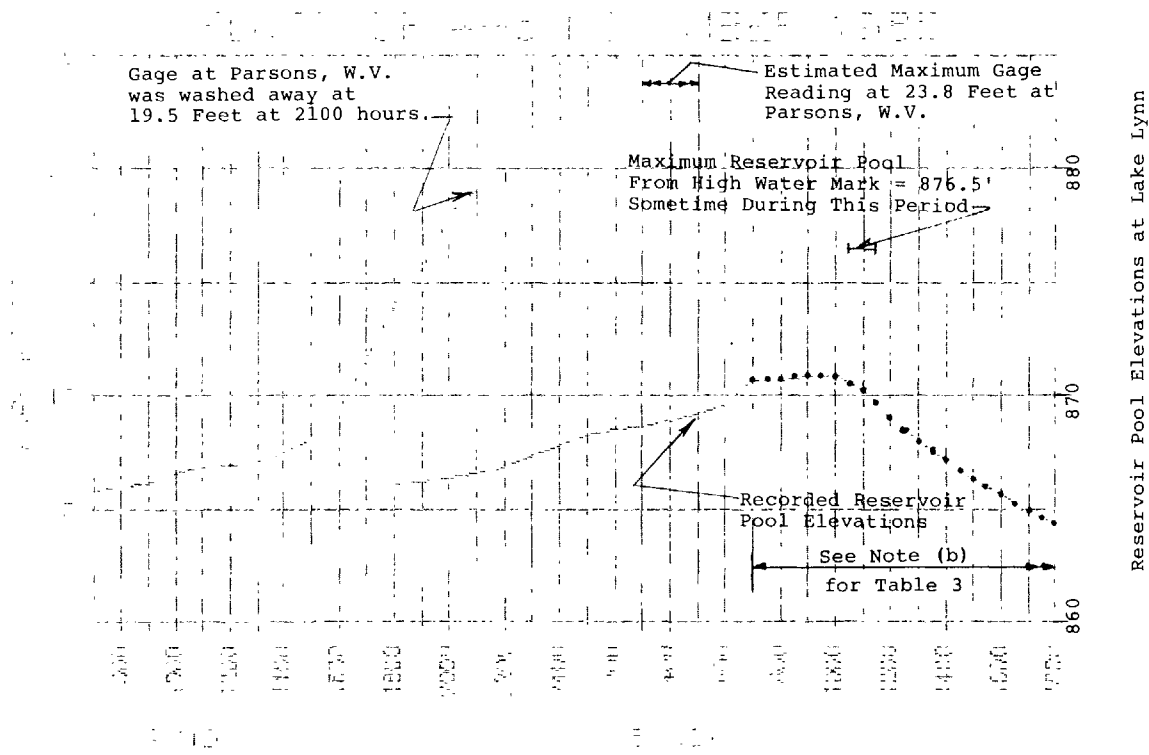


Figure 2. Stages at Lake Lynn Reservoir Pool and at Parsons, West Virginia

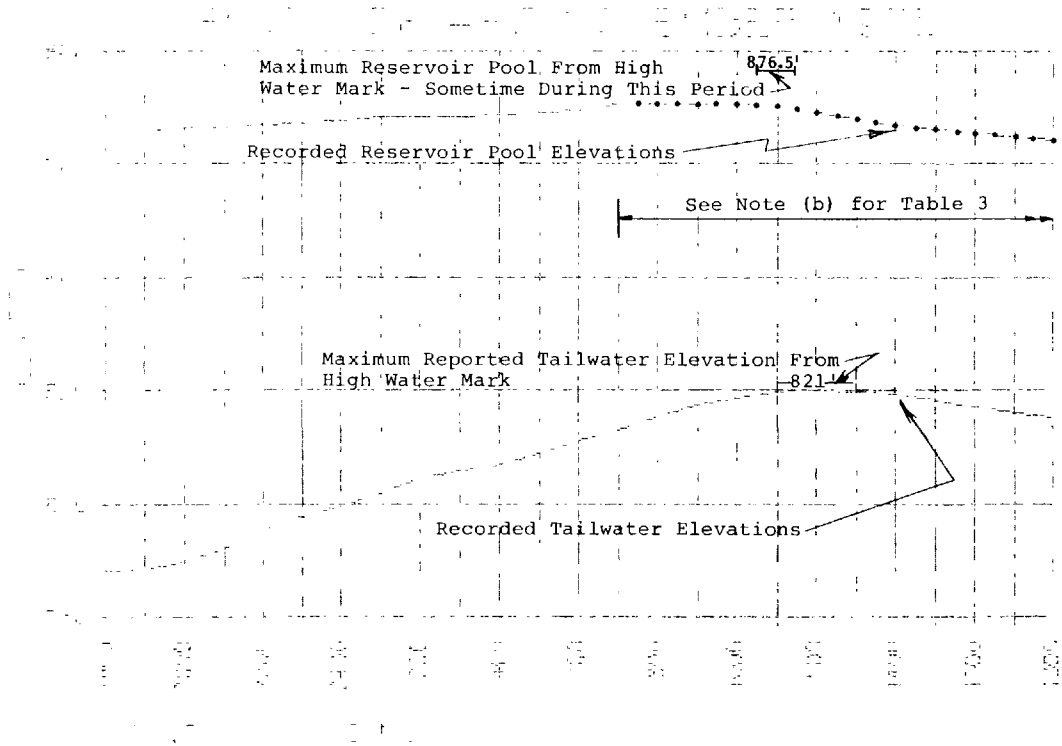


Figure 3. Tailwater and Reservoir Pool Elevations at Lake Lynn Dam

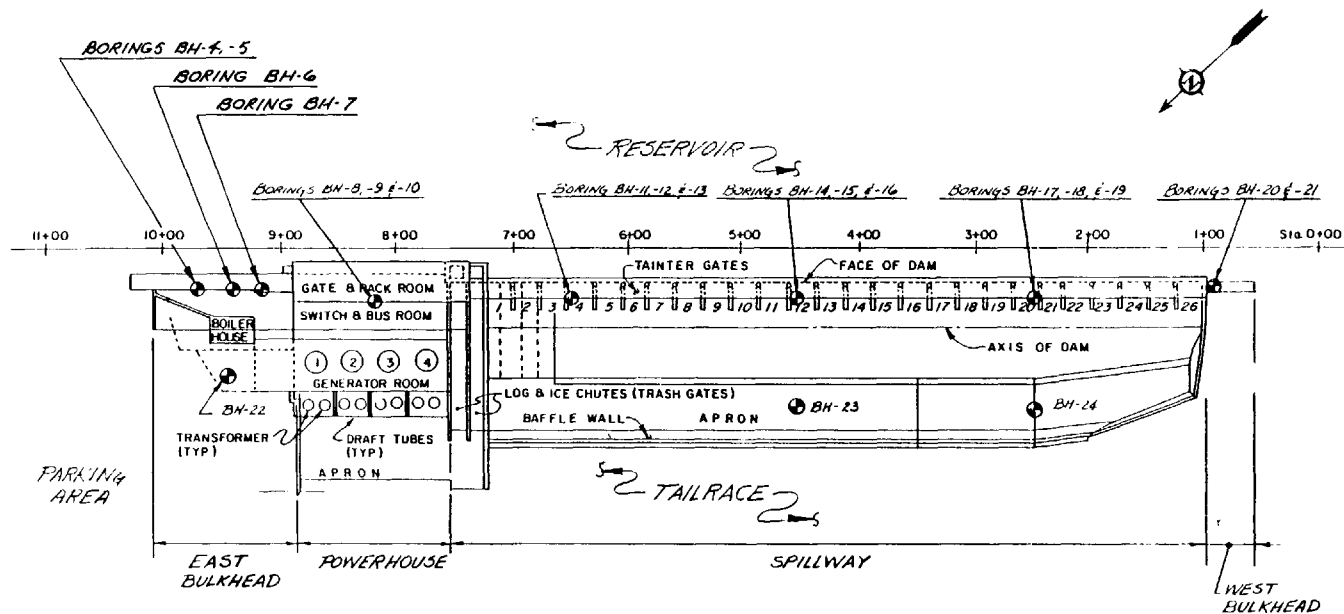
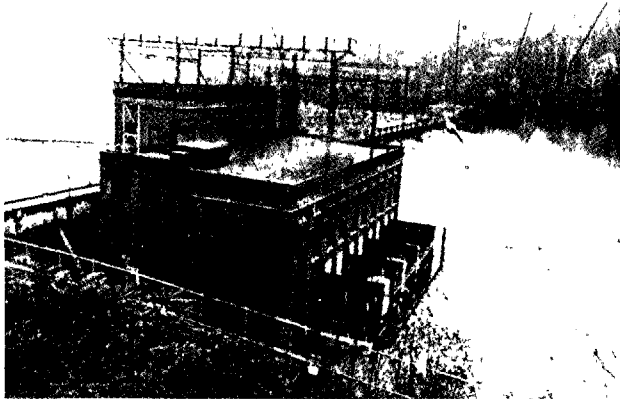


FIGURE 4
PLAN OF DAM AND BORING LOCATIONS



Photograph 1: Overview of Dam Facilities and Reservoir During Flood



Photograph 2: Overview of Dam Facilities and Tailrace During Flood

GAI CONSULTANTS INC.



Photograph 3: Floodwater on Deck of East Bulkhead
Near the Crest of the Flood

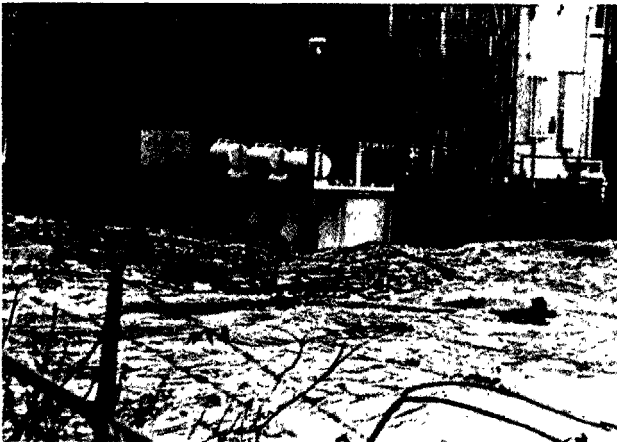


Photograph 4: Flooded Upper Level of Powerhouse

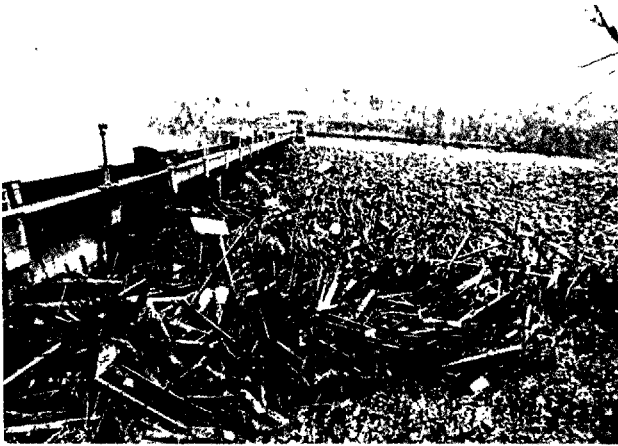
GAI CONSULTANTS INC.



Photograph 5: Flood Level on Downstream Side of Powerhouse



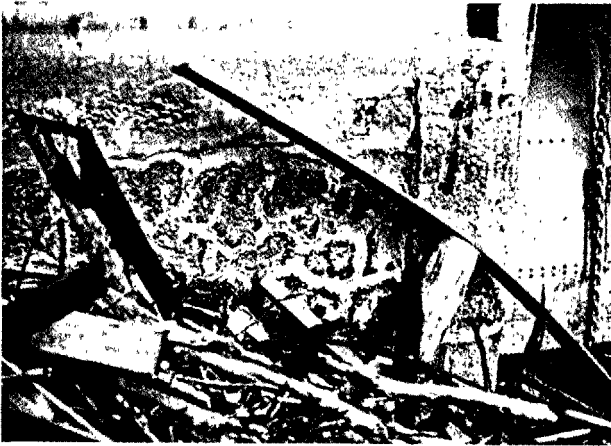
Photograph 6: View of Powerhouse and Spillway from Downstream
Near the Crest of the Flood



Photograph 7: Debris Accumulation Against Spillway During Flood



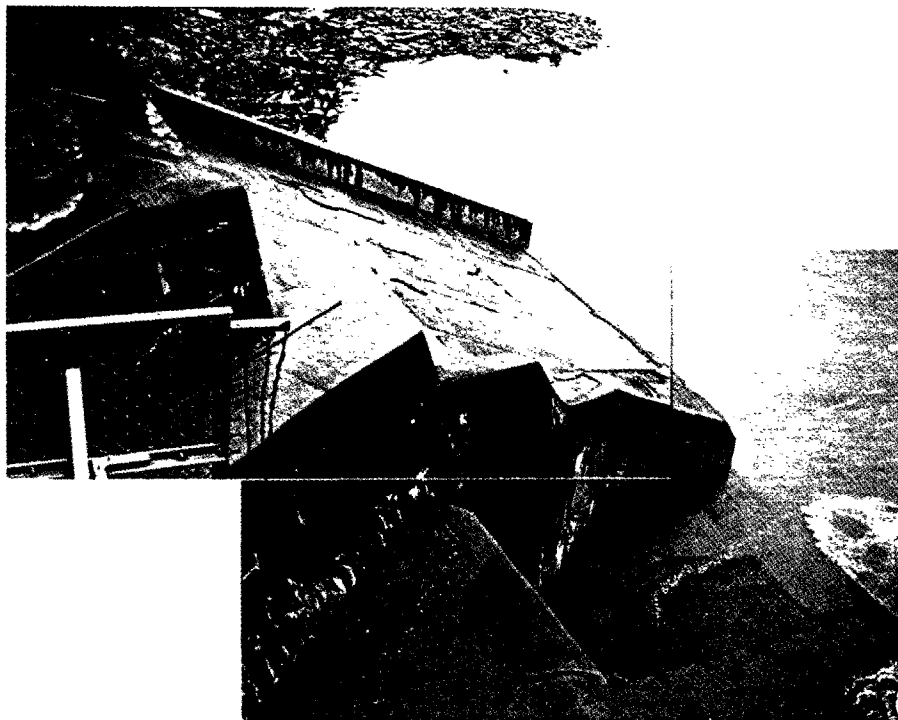
Photograph 8: Debris Deposited at Base of East Bulkhead after Flood



Photograph 9: Epoxied Cracks on Upstream Face of West Bulkhead



Photograph 10: Loosened Rock Block at Downstream Base of West Bulkhead



Photograph 11: Concrete Spalling/Abrasion on Concrete Mass Below Spillway Gates 23 through 26



Photograph 12: Vertical Crack at Construction Joint between Gates 21 and 22



Photograph 13: Horizontal Cracking in Spillway Surface below Gate 2

GAI CONSULTANTS INC

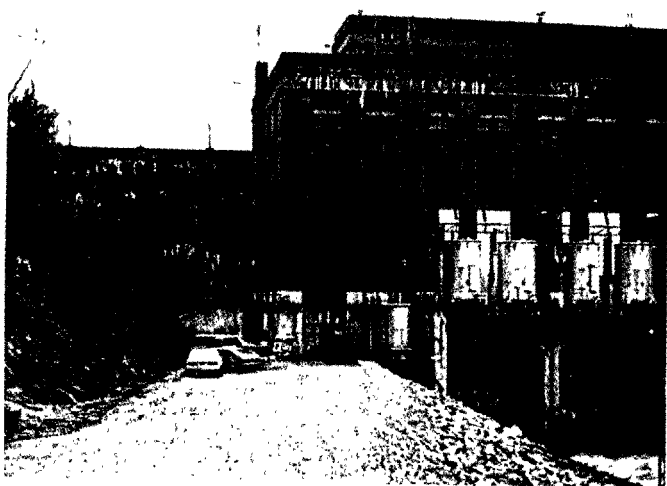


Photograph 14: Leakage through Left Vertical Seal of Gate 24

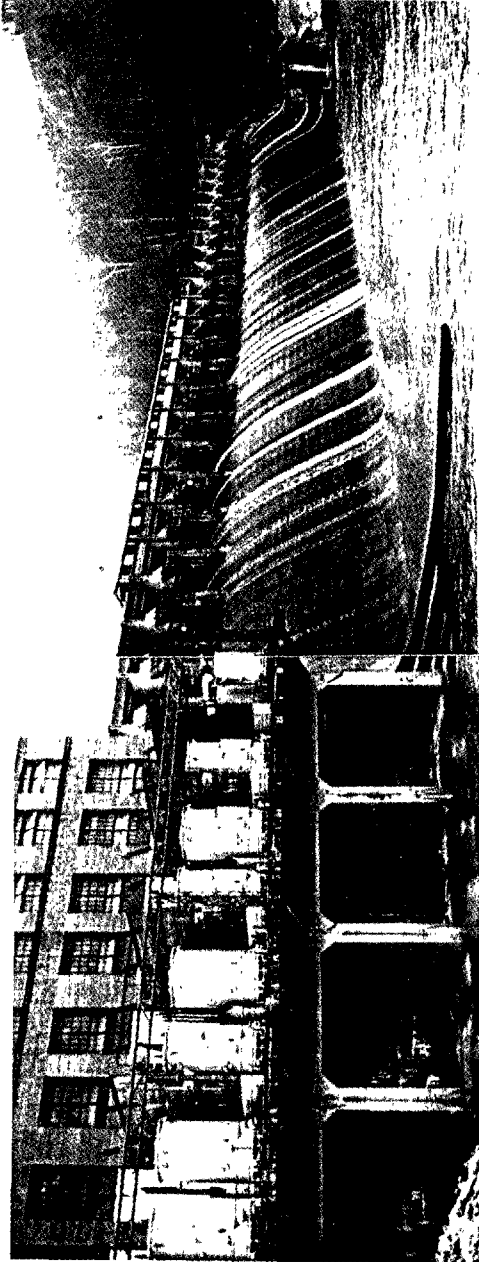


Photograph 15: Leakage from Vertical and Base Seals of Gate 6
(Note Debris Caught in Gate)

GAI CONSULTANTS INC.

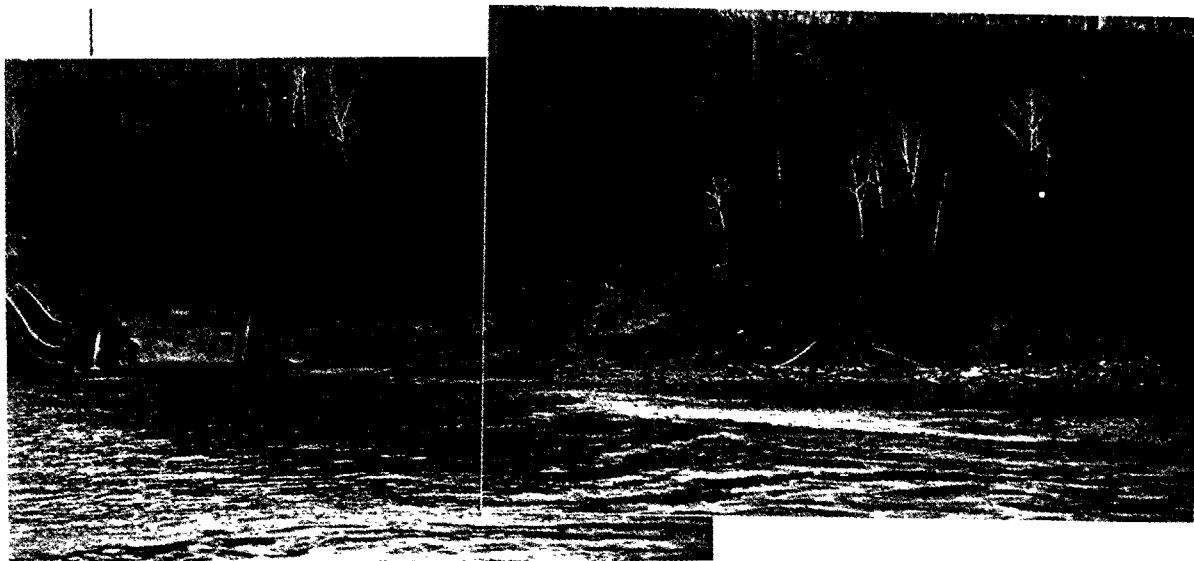


Photograph 16: View of Parking Area and Downstream Side of Powerhouse



Tailrace Pool Elevation 785.9 Feet

Photograph 17: Composite View of Downstream Side of Dam and Tailrace Area (continued on next page)



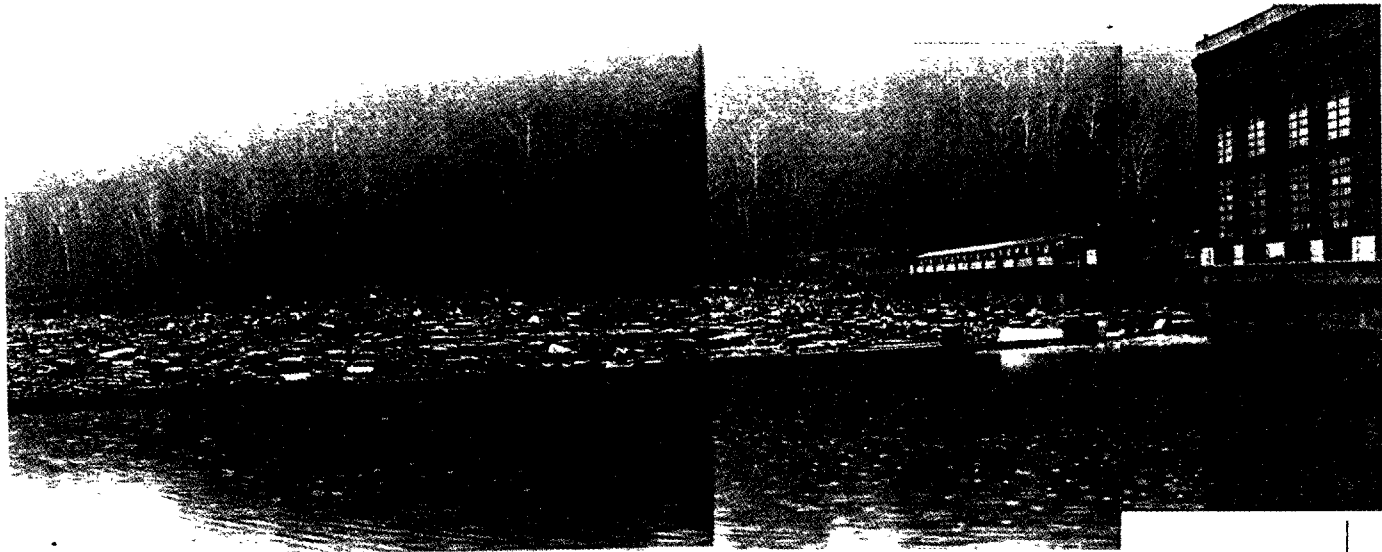
Tailrace Pool Elevation 785.9 Feet

1 Photograph 17: Composite View of Downstream Side of Dam and Tailrace Area (continued from previous page)



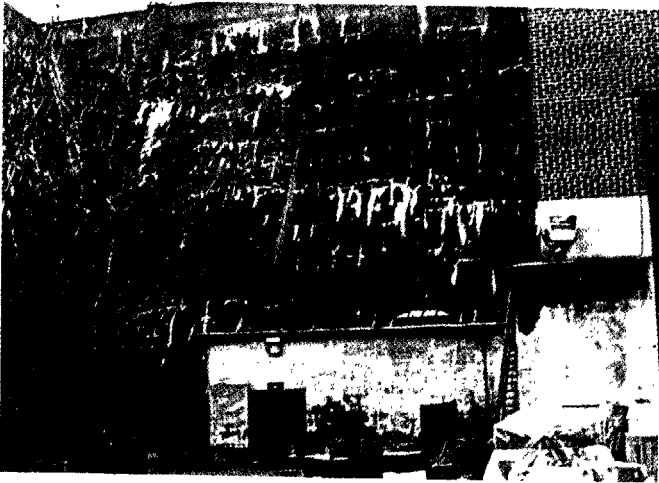
Reservoir Pool Elevation 861.3 Feet

1 Photograph 18: Composite View of Upstream Side of Dam and Reservoir (continued on next page)



Reservoir Pool Elevation 861.3 Feet

Photograph 18: Composite View of Upstream Side of Dam and Reservoir (continued from previous page)



Photograph 19: Downstream Side of East Bulkhead



Photograph 20: Crest of East Bulkhead



Photograph 21: Small Landslide above Parking Area

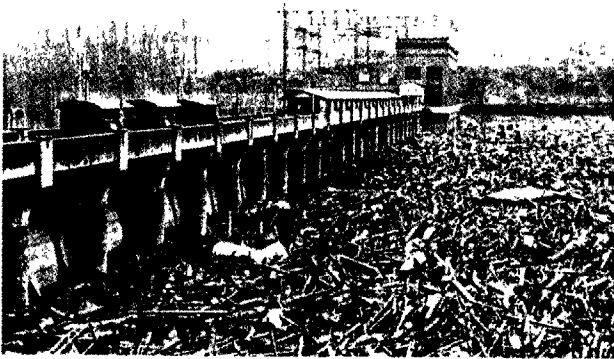


Photograph 22: Concrete Revetment and Rip Ram Adjacent to Draft Tube Discharge

GAI CONSULTANTS INC



Photograph 23: Rip Rap at Edge of Parking Area Downstream from Draft Tube Discharge



Photograph 24: Debris in Reservoir at Time of Field Inspection

Mr. ROE. The next witnesses are representing the State of Pennsylvania. It is the Honorable Pete J. Daley, Pennsylvania State Representative. Is Mr. Daley here?

Mr. MURPHY. May I advise you, Mr. Chairman, that State Representative Daley and I met this morning at about 8 o'clock, and I spent 45 minutes with him in Uniontown. He is there on a highway problem. He asked me to apologize that he is unable to be here. He is represented by his legislative assistant, Chip Andres.

Wave your hand back there—and Pete wants you to understand Mr. Daley is conducting a series of hearings on behalf of a resolution passed by the State legislature on the causes and result of this flooding and has assured me that he will submit his findings to you, Mr. Chairman, when his hearings are completed.

Mr. ROE. OK, fine.

Then our next group would be local government panel, Mr. Fred Lebder, chairman, Fayette County Commissioners, accompanied by Bernie Atz from Luzerne Township, supervisor; Mr. J. Bracken Burns, director, Emergency Management Service of Washington County; and Mr. Martin Niverth.

TESTIMONY OF FRED LEBDER, CHAIRMAN, FAYETTE COUNTY COMMISSIONERS, ACCOMPANIED BY BERNIE ATZ, LUZERNE TOWNSHIP SUPERVISOR; AND BOB JONES, COMMISSIONER; J. BRACKEN BURNS, DIRECTOR, EMERGENCY MANAGEMENT SERVICE, WASHINGTON COUNTY; MARTIN NIVERTH, DIRECTOR, GREENE COUNTY CONSERVATION DISTRICT, WAYNESBURG, PA

Mr. LEBDER. Mr. Chairman, I misunderstand the avenue of the testimony to be given here today. We have documented statements of the notification that we received from the Weather Bureau, from the West Pennsylvania Power Co. That is the dam here at the power company.

We have telephone documents that people were notified by the emergency management office, but I was under the impression that testimony here today was to be to see if there was a justification of building additional protections of waters.

If I would have known we were going to follow this, our emergency management director would have been here.

Mr. ROE. No, you are fine. I would suggest if there is no objection all records that you brought with you which relate to the issues that were presently discussed will now be considered as part of the record, because we are really trying to do two things here: one, we are not trying to ascertain what we can do, one, what should we be doing, and one, of course, obviously already emerging, we should be doing something on a better coordination and notification.

I think we have already established that fact. That is not the substance and toto of the discussion at all. What is key is what we do from here to prevent their happening again. So with your testimony, I think you are going in the direction we want to go.

If there is no objection, your record and data you have available can help us in sifting through and determining what we can do on better coordination either by implementation locally through the State or by Federal law. We appreciate that.

Second question, then, would be to proceed with your testimony as to what you want to present in your thoughts, and I guess what you think we should be doing?

Mr. LEBDER. The basic information that I would like to present is that the information that we received at the management office from the U.S. Weather Bureau, and the information that the Corps of Engineers was able to give to us, which would be limited because it is not their responsibility to issue those types of statements, did not reflect the severity of the flooding that was to occur on the fifth.

The report that the U.S. Weather Bureau said that they put out—I have a copy of that report here with me, and it will relate that their projection was not that the storm would be as severe as what actually happened. If we would have received a more severe warning, as indicated here today, the people of this area would have had an opportunity to not avoid, but to protect and remove some of their furniture that was in the basements, particularly in this area, the first-floor level.

They could have evacuated much earlier, so that coordination could be greatly improved. The coordination between West Virginia and Pennsylvania is, I understand from the reports that were given to us, was practically nonexistent as far as flooding in West Virginia related to Pennsylvania because if Pennsylvania and West Virginia, as already being piped out, we were just talking about minor flooding in Pennsylvania, which when you talk about flooding, you are not talking about forecasting tornado or hurricanes. You are talking about something that you can really put your hand on.

When you go into your hurricane forecasts and tornado forecasting, it is a different type of forecasting all together. I have had a quite a bit of experience in that, but I think that an improvement can be greatly improved between West Virginia and Pennsylvania if a similar situation would come up.

Once we were properly notified, and we were able to put our act together I think that we did wonders in Fayette County and I am sure they did in West Virginia to protect the properties of the people. Notification, establishing an emergency center—for instance, here in Point Marion, we had a mass care center at the high school. The fire company did the notification of evacuation of the community, and this was all done in an orderly fashion, but as we all know, now it should have been done hours sooner.

Maybe I will terminate at this time and let the other gentlemen, if you want me to read into the record the warnings that the gentlemen stated that came out at 8:40 over the teletype network located at emergency management center at the courthouse. We have received this copy.

At 8:40 p.m., eastern standard time, Tuesday, November 4, 1985, the National Weather Service has issued a flood warning for the Monongahela River. The river will start going over flood stage at 1 a.m., Tuesday, with increase occurring between 5 a.m. and 7 p.m., Tuesday. Then it goes and locates the area—Charleroi, Elizabeth, now immediately Greensburg, which is across the river.

Greensburg should increase at 24 feet at 7 a.m., Tuesday. This is 3 feet over flood stage. Two, Point Marion will be a half a foot over flood stage; Maxwell 2 feet over flood stage, and Braddock, 2 feet

over flood stage, and it goes on and on. So, we did receive that communication, and we have it as a matter of record. It will be furnished to you along with the Weather Bureau. So as these warnings were issued to us, automatically, we are responsible to pass it on through to the various localities. We have documents by phone calls, the calls that we made, the length of the phone calls that were made and to what individuals responded to those calls.

For instance, West Pennsylvania notifies the Fayette County Emergency Center about stage 1, 2, 3 and 4 in their plan. We are responsible to notify the Point Marion Police Department. They notify the fire department. They have certain things they do. We notify the Pennsylvania State Police. They set up roadblocks. That was all done, and it is all documented. That was all followed through, but the question now is how much sooner could we have done this. Why did not we receive notification upfront, so that will have to be written up eventually in your report and analysis on what happened and how can we improve so it won't happen again.

This is Bob Jones, my counterpart, county commissioner.

Mr. JONES. I really don't have much to add. He about covered it all. Thank you for listening to us. We do have a terrible problem, and we hope you will help us with it, and particularly, Congressman Murphy, who we are in touch with on timely basis, and I know in respect for time. I am going to pass this down to some gentlemen during the Maxwell area that did have serious problems and they weren't on the map.

Mr. ATZ. My name is Bernie Atz, a Luzerne Township supervisor.

I have a prepared statement, but for reasons of time, I will just bypass that.

Mr. ROE. Your statement will appear in full in the record.

Mr. ATZ. I would like to summarize what I have heard today; that there was some fine testimony by all involved, but I feel that the warning system, as it presently exists, is satisfactory if you are a corps employee or if you are a West Pennsylvania Power employee, or a Weather Service employee, but I do not feel that the system is able to serve those that are most important, and that is the people that are effected by this flood.

I will turn it over.

Mr. BURNS. As everyone else has before me, I would like to avoid reading the testimony that I have prepared. First, let me state that I am here representing the county commissioners from Washington County who could not be present, and my testimony primarily poses three questions that they have that remain unanswered.

One of them was answered in part here today. I had no way of knowing that that was going to be done. Let me just briefly summarize those three questions for you.

The first one I would like to read in some detail, and then we will submit the testimony. The first question is, Could the predictions provided us by the National Weather Service prior to the flooding have been more timely and more accurate? Initial predictions called for the river to crest at lock No. 4 Charleroi at 35 feet at 3 p.m., on November 5. In reality, the river crested at more than 44.7 feet at 2 a.m. on Wednesday, November 6.

From the time that the original prediction of a crest of 35 feet was received at 8:40 p.m. on November 4 until the river actually

crested, more than 27 hours later, we received only two actual readings from the National Weather Service relative to lock No. 4 Charleroi.

It would seem advisable that the National Weather Service should step up their monitoring procedures during an event of the magnitude of the Election Day Flood.

Let me just amplify on that, if I may. What I am saying is that although we heard from them more than twice, we received only two actual readings from the lock which, as you look at these teletypes and they make predictions, one thing that—to me anyhow—has been meaningful in the past is where the river, is at this point in time. I am assuming that is the part of the data that they use to make their predictions, so it was a source of some concern to me that these readings were not taken more frequently than every 12 hours in the middle of the worst flood in the history of the river.

Our second question had to do with Congressman Murphy's question about whether or not dams and locks designed for other purposes could be used in an emergency to control floodwaters. I appreciate the answer that has been given. It is a more comprehensive answer than we have been able to receive to this point in time.

Our third and final question has to do with the numerous reports that we received from county residents concerning the extraordinarily rapid rise of floodwaters in the afternoon of November 5.

Many observers have told us that the floodwaters rose as much as 4 feet in 1 hour. It seems possible, if not probable, that such a precipitous rise might have been caused by a poorly planned release of floodwaters from a dam upstream.

From the testimony today, if it is accurate, maybe this is not true, but it is still, I know, a source of concern to many residents in the county, those who live by the river, those who have been in a flood before, that that was an extraordinary amount of water in a very short period of time, and I think we would be remiss not to share that concern or that question with you.

Also, the commissioners wish to convey their support for a further review and implementation of the Rowlesburg flood control project.

Mr. ROE. Mr. Niverth.

Mr. NIVERTH. Thank you. I regret I do not have written testimony to submit at this time, and will be providing it shortly.

Basically, I would like to, on behalf of Greene County, endorse the activity that has been undertaken by Representative Murphy today, and also by Commissioner Lebder and people at this table who have testified before me. And I won't really further belabor their points. The facts are there, and they will be submitted. We have been damaged, of course. Everyone lives in the county knows that there is a dollar value estimate that is tremendous, but we also have an intangible loss, things that you can't put a price on, things that people never get really repaid for that happened as a result of this flood.

It must be remembered that the Monongahela is a main artery of Greene County. We do not have the luxury of major highways running to and fro. We have one. We perceive the damage as occurring basically two ways that were sustained by the actual flood and that was sustained because of communications or lack of them.

Basically, communications went like this: I am sure everyone is aware that the rumors spread that the Cheat Dam had in fact broken, giving rise to a great deal of panic along the floodplain or the floodplain is not composed of people possessing Ph.D.'s in hydrology, and panic is very likely.

When someone says something like a dam has just burst, a great deal of furniture, a great deal of property that could have been removed was not because of this. We would like to see a few things come out of this hearing. I guess there is just—basically we had people displaced. They had to congregate in various shelters. They were hungry, and we had to go through redtape to give them food. People get hungry now, they want to eat now.

We need improved communications to the public. That has already been brought up. That is quite obvious, but also, further we need public understanding of these communications. They need to be broken down so people know exactly what is going on, exactly what to do so that speculation is kept to a minimum, thereby keep panic to a minimum.

We would like to see anything possible to reduce the flood potential short of controlling Mother Nature. The Army Corps testified, and they said that some of the facilities were talking about today, notably the dam at Cheat and the locks and dams are not designed for flood control. That is not the question. The question is can they be operated in this capacity, and we are not satisfied with the results or the ramifications of letting the pools down a little bit so that some water could be contained.

We do not recognize ourselves as being subservient or secondary in any aspect to the concerns of industry. Without the people, industry is nothing. I would like to conclude at this point. I will provide later, as I said.

Mr. ROE. Thank you. Are there any questions.

Mr. MURPHY. Only one. I do appreciate all of the efforts. I know I witnessed the efforts of the commissioners and the supervisors in all three counties, as well as all of the volunteer agencies that without it we would have had a totally intolerable situation.

I wonder if you can relate to—the commissioners from Fayette are here—to the commissioners in the other two counties and provide us with the data of when you received notice and how you disseminate notice back out to the communities.

I think that then we can maybe tie this whole thing together and come up with a recommendation, Mr. Lebder—that you suggest that this committee might come out with a recommendation how best to improve the notification should this ever happen again.

If you could provide us with the three-county data, maybe we can sift all through it from the Weather Service down to the communities.

Mr. LEBDER. Yes, sir.

Mr. CLINGER. This rumor that got started, that the Cheat Dam had gone out, was that disseminated over the radio, or how did the rumor get going?

Mr. NIVERTH. To my knowledge, it was disseminated over the radio.

Mr. LEBDER. I was in Point Marion. I received a call at my home about 7 o'clock. You being a Congressman, you know that was the

day of the election here in Pennsylvania. A young lady in the back of the room called saying, "Commissioner, we just closed our polls." And that was about 7 minutes of 7 o'clock.

I said, "What happened?" She said, "The river is coming over." We came up town. We got here, the water was going into the polling places. People were unable to vote.

Mr. MURPHY. Was that in the morning?

Mr. LEBDER. Yes, we got out. In the meantime Point Marion, when I got here, I had to wade across this bridge over water that was over my knees, and about 10 o'clock that morning or shortly thereafter, Father Burns here—if he is still here—came running up the street and said a truck just stopped across the bridge. I think I am telling this correctly—reported the dam has bursted, evacuate the downtown Point Marion, and I am going to tell you it was panic.

There were children, women crying trying to get up over the hill, and up to the school—said that truck just stopped and said the dam has bursted. Finally, that information got out over the radio and television and they picked it up downstream, and naturally it did not burst.

Shortly after this, I had channel 4 helicopter flying me over the West Pennsylvania Power Dam. It was there, and it was filled with water and debris.

Mr. MURPHY. I want to substantiate that, Bob. I had dozens of people tell me that when they received the report that the dam had burst, they left their homes and left everything and watched as close as three blocks away on higher ground the water come up and cover their property when they could have utilized that couple of hours and saved some things. That rumor would have devastated many of the small communities.

Mr. ATZ. One thing we haven't mentioned the Maxwell Lock and Dam. We had an additional problem than just the flood. We had the barge situation where the barge piled in against the dam itself. Under the old lock system, those barges would have normally just ran over the top of the dam and ran on down the river, but with this new construction, the new type of dam that they have there, the superstructure of the dam actually stopped the barges, and then in turn stopped a lot of debris and a lot of other things that normally would run down the river in a flood.

We at no time—in my township we are concerned about the water coming up into a residential area. That would be so severe we would have to evacuate. Until that first barge hit—when that first barge hit, we got 4 feet of water in 5 minutes. We took the last person out by boat. It is in the testimony. I wanted it brought out here that also. That also contributes to some of the water rising, at least in our township, and in a lot of Greene and Washington Counties.

Mr. ROE. We want to thank you.

[Mr. Atz', Mr. Burn's, and Greene County Board of Commissioners' prepared statements follow:]

Bernie Atz

My remarks will be confined to what occurred on November 5th.

At 12:30 A.M. on Nov. 5, 1985, I recieved a call stating that we have an emergency at LaBelle Processing Co. and that a slurry pond was in danger of collapsing. I proceeded to the fire station at LaBelle where I met Chief James Harvey, we then went to the plant to secure more information on the problem. At the plant we talked to Mr. Tom Cole, plant superintendent, who stated that in his opinion we have a serious crack in the structure and that it could let go at any time. Unlike the previous scare, there were no homes in the immediate area so we decided that closing the state road in that area would be the only action necessary at that time.

It is during this period that we, Chief Harvey and/or myself, were allegedly notified of the impending danger of flooding on the Mon River. We were not notified I called out a Township employee to assist in manning the roadblock and at approximately 3 A.M. went to the Maxwell Lock and Dam to see what was going on there. My brother-in-law works there as does the Township Emergency Management Coordinator. They were stripping the locks and I wondered why. My brother-in-law told me that the water would soon be over the wall. This did not alarm me too much as the same thing was done before, Agnes most recently, and water has never gotten into the Patch yet. We have had to pump basements, but no one ever had water any higher. The water rose steadily all night. Shortly before daylight, 5:30 A.M. I went home for a nap. At approximately 7:30 A.M. I received a call from the Township Coordinator that there was a possibility that the Cheat Dam could break. I returned to the Fire Hall and told Chief Harvey that I was going back down to the locks to learn

what I could. When I got there the place was bustling with activity. I was told that they were not sure when the water would crest and they had no idea, since their gauges were out, what was happening upstream.

Keep in mind that there is still no really great concern being shown about the rising water, because water has never risen to the houses in Maxwell.

By 9:00 A.M. I decided to drive to other areas of the Township. I carried a portable fire radio with me in order to maintain contact with the Fire Co. I arrived at East Millsboro in time to see people evacuating. The Fire Companies were pumping basements and assisting in any way they could. I proceeded to the voting poll at Mr. McClellands. I had to go in from the back road because the main road was flooded. I called the Fayette County Election Bureau to see if we could have the poll relocated. They stated that Point Marion's Poll was being relocated and they would get there as soon as they could.

I returned to LaBelle Fire Hall to see how they were doing. Chief Harvey reported that there still is no word as to how high the water would get. We decided to go down to Maxwell when we heard that some barges were loose on the river and heading our way. Please keep in mind that we still have not received any official notice to evacuate. When we got to Maxwell, a crowd had gathered at the Little League field to watch the river. The time is around 11:00 A.M.. We were still not too concerned about the water overflowing into Maxwell, however, when the first barge struck the locks the water began rushing upstream. As more barges hit, we realized we had to evacuate and we then ordered that to be done. Within 15 to 20 minutes the road into Maxwell had 3 to 4 feet of water

on it and the town was inundated. The last person was evacuated from there by boat shortly after noon.

In summary, I feel that the warning system as it presently exists is satisfactory if you are a Corps employee, or a West Penn Power employee, or a National Weather Service employee. I do not, however, feel that the system is able to serve those that are most important. The victims of the disaster of 1985.

*Sincerely,
Edward A. [Signature]*

LEONARD R. SANTORE
DANIEL E. BAILEY
JOHN R. GARDNER
COMMISSIONERS



HERBERT A. COX
CHIEF CLERK
A. J. MARION
SOLICITOR

OFFICIAL TESTIMONY OF THE GREENE COUNTY BOARD OF COMMISSIONERS
RE: November 4, 1985 Flood on Monongahela River

The damage suffered by Greene County as a result of the Election Day Flood of November 1985 was tremendous. The dollar figure is well known to members of this panel, but even this astronomical figure is further amplified when one considers the fact that the Monongahela River is a main artery of highway-poor Greene County. Further, it must be stated that some of the damage incurred as a result of this catastrophe has no price tag. Individual and group efforts toward beautification and recreation were lost and are irretrievable. Homes were lost, heirlooms were lost, art was lost, and, in some cases, even health was lost.

The Greene County Board of Commissioners is just that. We are not weathermen, lawyers, or hydrologists. The daily operations at the West Penn Power dam on the Cheat, as well as the workings of the U.S. Army Corps of Engineers, go on relatively unnoticed as far as we are concerned. We have only a general idea of the structure and function of the facilities in question, but it does not require the knowledge of a Ph.D. to look at this occurrence with a rather skeptical eye.

Both the operators of the West Penn Power dam and the Army Corps of Engineers have gone to great pains to disseminate the information that the facilities in their charge on the Monongahela (i.e. the dam on the Cheat and the transportation locks and dams on the Monongahela) are not designed for flood control. It is difficult, however, to observe these structures in place and not come away with the feeling that they can be used in this capacity. It is our opinion that they can and should be used in this capacity when the situation warrants it. Surely, in this age of computers, a workable system can be implemented along our hundreds of miles of locks that can insure at least a small flood-acceptance capacity which, when combined with other relieving measures, would substantially reduce damage potential.

Further, we feel that the issue of barge traffic on the river should be investigated. Although we are not in the business of flood elevation documentation, residents have reported that crests occurred upstream AFTER the same crest downstream. This suggests impoundment, and it is known that "runaway" barges created an impressive wall once trapped at the Maxwell Lock & Dam below Fredencktown. These same "runaways" sailed smoothly over the obsolete lock & dam at Greensboro. Should something be done physically at locks such as Maxwell to prevent this? Should regulations governing barge use be amended to reduce "runaway" possibility? We think so, and we feel very fortunate that our problems were not further compounded by the loss of major bridges across the Monongahela. It does not take an engineer to know that this could easily have happened.

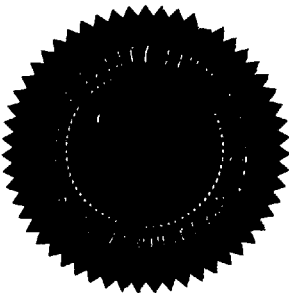
GREENE COUNTY OFFICE BUILDING
WAYNESBURG, PENNA 15370
(412) 852-1171

Perhaps the most important factor regarding this catastrophe and contributing to it is communication. Our fire companies, emergency personnel, and private citizens gave a tremendous effort in helping the flood victims to recover valuables and obtain food, shelter, and clothing. This fact becomes even more a feat when it is considered in light of the fact that the most frequently and efficiently transmitted flood information in Greene County was an irresponsible lie that ultimately accounted for a tremendous amount of preventable damage. Information passed by radio indicated that the West Penn Power dam had burst precipitating a general panic resulting in the loss of a tremendous amount of portable items that would have been moved to safe ground under other circumstances.

To be basic and brief, we feel that flood reporting processes with respect to all concerned parties must be updated and upgraded to a point of REAL effectiveness. Submittals from other counties involved, which do reflect the experience of Greene, will certainly add weight to our opinion.

The Board of Commissioners of Greene County wish to conclude testimony by asking that the following two items be taken into consideration in the formulation of a successful plan which will hopefully greatly reduce the potential for a recurrence of this devastating event. One, we would like to be able to provide food for the displaced from our stock of USDA food for other programs WITHOUT red tape. Hunger cannot be tabled until the next meeting. Two, please remember to consider the people FIRST if objections regarding use of locks and dams for flood control center on inconvenience to industry. We do not recognize ourselves as being subserviant or secondary in any aspect to the concerns of industry.

The Board of Commissioners of Greene County offers its thanks for the opportunity to testify, and, further, we are grateful for the activity initiated by Congressman Austin J. Murphy and carried through both federal and state levels. Should any additional documentation or participation be desired, please advise.





FRANK R. MASCARA CHAIRMAN
METRO PETROSKY JR.
EDWARD M. PALUSO
COUNTY COMMISSIONERS

County of Washington

COMMONWEALTH OF PENNSYLVANIA
WASHINGTON PA 15301

J. Bracken Burns
DIRECTOR

TELEPHONE
222-8970

EMERGENCY MANAGEMENT AGENCY

TESTIMONY PRESENTED BEFORE THE
U.S. HOUSE OF REPRESENTATIVES COMMITTEE
ON PUBLIC WORKS - SUBCOMMITTEE ON WATER RESOURCES

by J. Bracken Burns
Director of Emergency Services
Washington County
Pennsylvania

It is an honor for me to appear before the House Committee on Public Works - Subcommittee on Water Resources on behalf of the Commissioners of Washington County and the 217,000 County residents that we serve.

On November 5, 1985, the Monongahela River experienced the worst flooding in the recorded history of that river. In Washington County alone, 88 homes were destroyed and another 1,133 received significant damage. When we consider the 104 businesses that were affected and recognize that losses are conservatively estimated at \$15,000,000, we begin to see the magnitude of the Election Day flood.

The Washington County Commissioners were among the first, if not the first, to contact our representative, Austin J. Murphy, to request a congressional inquiry into the circumstances surrounding this tragic event.

As public officials charged with the responsibility for the health and welfare of the citizens of Washington County, the Washington County Commissioners have several questions that

remain unanswered three months after the flood. In the brief time allotted to us, I would like to pose these questions and assure the members of the Subcommittee and those present that they are not posed rhetorically.

1. Could the predictions provided us by the National Weather Service prior to the flooding have been more timely and more accurate?

- Initial predictions called for the river to crest at Lock #4 Charleroi at 35 feet at 3:00 p.m. on November 5th. In reality, the River crested at more than 44.7 feet at 2:00 a.m. on Wednesday, November 6th.

- From the time that the original prediction of a crest of 35 feet was received at 8:40 p.m. on November 4th until the river actually crested, more than 27 hours later, we received only two actual readings from the National Weather Service relative to Lock #4 Charleroi.

- It would seem advisable that the National Weather Service should step-up their monitoring procedures during an event of the magnitude of the Election Day Flood.

2. Is it possible that navigational locks and dams, and dams designed for the productions of hydro-electric power could be used, during emergencies, to control flood waters?

- I was present at a meeting on December 7, 1985, when Congressman Murphy posed this question to officials of the West Penn Power Company and received what I would label as an inadequate response, at best.

- It seems reasonable that, in anticipation of flood waters, these structures which are capable of retarding the natural flow

of the river could be opened to lower the river level, thus lessening the effect of the flood waters.

3. Our third and final question has to do with the numerous reports that we received from County residents concerning the extraordinarily rapid rise of the flood waters in the afternoon of November 5th. Many observers have told us that the flood waters rose as much as 4 feet in 1 hour. It seems possible, if not probable, that such a precipitous rise might have been caused by a poorly planned release of flood waters from a dam up stream.

Those of us who hold elective or appointed positions in which we are responsible, in part, for the welfare of our fellow citizens pose these questions as part of that responsibility. We are not, and do not profess to be, hydrologists, engineers, or meteorologists. Hopefully, through the influence of this committee of inquiry, we will receive the answers to the questions posed here today.

In closing, let me share with you the hope of the Washington County Commissioners that the Rowlesburg Flood Control Project will receive a thorough and expeditious re-examination by the Congress of the United States.

Thank you.

Mr. ROE. At this time, we will take our next group, which is our business panel. If you want to stay available, we would appreciate it.

Our business panel is the next set of witnesses: Mr. Andrew L. Millington of the Dillner Storage Co., West Elizabeth; and we have George Ashcraft.

We will start with Mr. Millington.

Do you have a formal statement?

TESTIMONY OF ANDREW L. MILLINGTON, DILLNER STORAGE CO., WEST ELIZABETH/PITTSBURGH, PA; AND GEORGE W. ASHCRAFT, ASHCRAFT CONSTRUCTION CO., MONONGAHELA, PA

Mr. MILLINGTON. Yes, sir.

Mr. ROE. We will let that appear in full in the record. In fact, both of you will appear in full in the record.

Mr. MILLINGTON. Mr. Chairman, I thank you, the committee, ladies and gentlemen.

I will give you excerpts from a prepared statement that I made, and we will not take the time of going through it, as I will touch the highlights.

The Dillner Storage Co. broke ground in 1954, in West Elizabeth, Monongahela River, right above lock 3, two-tenths of a mile on the left bank. In the spring of that year, we experienced high water and we were told by the local people that the water that we were experiencing was close to the level of the 1936 flood.

We graded above that 1936 flood level. It was a blessing in disguise. We thought that if we would go 4 or 5 feet above that, we would not have to worry. That is how we fixed the grade of land above flood level.

Years have come and gone and we have experienced high water in the spring and fall, with really no damage outside of the river being closed due to lock closures. Only now we are calling it the November 6 flood, because that is when we were hit with extremely high water causing physical damages and financial losses.

On November 4, Sunday, I called lock No. 3, and at this time I would like to express thanks and gratitude to the Corps of Engineers and the people that man lock 3. They have been more than helpful throughout the years, especially in this case, with the high water. Any information we asked for, they gave us all the information that was available to them.

On Sunday—we had a barge tied up at our terminal. With the amount of rain that we had, I talked to lock 3, at approximately 11 o'clock Sunday night, and asked what was the condition of the river above us. I was told that everything was calm, the Cheat Lake was calm, nothing; there was no operations whatsoever. Of course, it didn't seem right with all the rainfall we experienced in the past week.

On Monday, upon getting to the office, I checked again. Nothing out of the abnormal. We prepared for high water nevertheless as past experiences told us we were going to get high water and flooding.

On Tuesday, November 5, we received the high water that the people here received on Monday. The river rose a little over 16 feet

within 24 hours at our location—4 feet over any record that we have had ever set at our terminal in past years.

At 3 o'clock in the morning on the November 6, I called lock 3. We already had 2 to 3 inches of water in the office. I said we are tired of playing this game; how much more water are we going to get? He said, we have been told you are going to get another 4 feet of water.

I said, we couldn't possibly receive any more water, and we never received that water. The water fell off at lock 3 within 41 hours. The lock could have gone back into operation with a fall of 16 feet back to 17 feet on the upper pool. That is their upper gauge readings. It took 41 hours for 16 feet of water to dissipate.

The Thanksgiving flood, which we got I believe 3.6 feet, the lock was closed for 72 hours, for a little over 3 feet of water. Now, that is a result of the Youghiogheny River flooding.

In all the testimony that we have heard here today, Allegheny County has been sort of left out. We are in Allegheny County. Had the Allegheny River and the Youghiogheny River been in flood stage when this massive amount of water hit our area, the destruction of property and lives in that area would have been phenomenal.

As it was with the bridges, as the barges broke away from Clairton, at the coal dock I believe they lost 32. And they went down to Ingram Barge Line and picked up 16 more. They went to the Union coal dock and picked up nine loads there and bombarded lock 2. The barges that went over lock 2 were ricocheting off the bridges in the Pittsburgh area, which closed the bridges due to traffic during rush hour.

As I say, that is all I am going to say on it. There was no warning or communications, the only information we had was lock 3 who did everything within their power to tell us what was going on.

With that, I thank you.

Mr. ROE. I thank the gentleman.

Mr. Ashcraft.

Mr. ASHCRAFT. Mr. Chairman, my name is George W. Ashcraft. I am the owner of Ashcraft Construction Co. My business is located approximately 1,000 feet off the Monongahela River, near the mouth of Pigeon Creek in Monongahela.

We have been operating off this location since 1970. During this time, I have become very familiar with flood elevations. The November 5 flood crested approximately 7 inches higher than the elevation given to me by the Corps of Engineers. Therefore, leaving me with 7 inches of water damages in all of my buildings.

My questions are, When the Weather Bureau called for rain continuously right through the weekend, starting Friday morning, why was there not more water released from the dam sooner than it was? From what I had observed in the Pigeon Creek area on Monday morning, the creek was still running just a little bit above normal.

Second, on Tuesday morning, at approximately 5:30 a.m., I received a report over the police scanner that Park Avenue was going to be closed off due to the high water. At this point, it would have risen 14 feet more before it would have reached us. After

hearing the report, I immediately tried to get in touch with the attendant at lock 4. I reached him at approximately 7 a.m. on November 5, 1985. He explained to me that the water was at 30 feet then and would crest at 35 feet at approximately 3 p.m.

Hearing this, I went about my business with little concern with the high water. At approximately 10:30 a.m., I had received a report that word was out that the dam had broken and that the water was going to rise considerably. I immediately directed my men to start moving equipment to higher ground.

Shortly after that, I received another report from my office that the police scanner had just announced that the State police reported that the dam had not broken and to disregard the rumor. At that point, the water would still have had to have risen 10 feet to have caused us any great damage.

Some time in the afternoon, our phones quit working completely and the road leading into our place had covered with water, leaving us isolated.

At 3 p.m., when the water was supposed to crest, it was still rising rapidly. We found ourselves moving equipment two and three times, because each time we had moved it to higher ground the water was up again. At 11 p.m., we had approximately six people helping me to move equipment. At that point, we were all wading in water.

We had received numerous reports throughout the day. The last report we received at this time came from a fireman who sent word that the radio announced that the river would not crest until 4 a.m. on November 6, 1985.

We had totally run out of ideas as to how to raise anything else to save it. Fortunately, it crested about midnight.

Throughout the day, we had never received a single report that even came close to the actual time that the water would crest or at the height it would crest at.

I am sorry my time is limited when there is so much to say. But I would like to leave you with two thoughts in mind.

First, I feel that control of the Cheat Dam should be with the Corps of Engineers and not with the power company. The primary use of this dam under these conditions should be flood prevention first.

Second, in 1970, the Rowlesburg Dam was proposed and put on hold. If this dam would have been built at this time, the November 5 flood damage would have been prevented.

I strongly urge that the Rowlesburg Dam be built as soon as possible.

Thank you.

Mr. ROE. Thank you very much.

Are there questions?

Gentlemen, we want to thank you very much for your participation.

[Mr. Millington's and Mr. Ashcraft's prepared statements follow:]

Dillner Storage Company

Fireproof Warehouse

2748 West Liberty Avenue

Pittsburgh, Pa. 15218

341-3300

January 30, 1986

The Honorable Austin J. Murphy
House of Representatives
2210 Rayburn Building
Washington, DC 20515

Sir:

The Dillner Storage Company broke ground for its river terminal at Jones Street and Monongahela River, West Elizabeth, PA in the Fall of 1954. In the following Spring of 1955 we were in the process of filling and grading in the marsh areas of our property when a flood occurred. We were advised that the water rose almost as high as the 1936 flood. Although the high waters caused havoc with our newly filled area, we felt that we were very fortunate that timely warnings came before the coming of the high water. We immediately added three to five feet of new fill on top of the existing grade so that in future years we would not have to worry about a flooding situation on our property.

The years have come and gone and we have experienced high water levels at the terminal both in the Spring and Fall. In March of 1967 we had extremely high water that came within 38 inches of going over the top of our dock but did not result in the flooding of our property or warehouses. In June of 1972 another high level of water came within 35 inches of going over the dock and again our property and warehouses were spared flooding.

On November 6, 1985 at approximately 2:00 AM the Monongahela River crested with a level of water eight inches over our dock in which we had water covering all of our property, in the warehouses and in the terminal offices. In previous years during high water periods the experience has been a slow rise and slow fall with substantial warnings all along the river.

On November 5, 1985 Lock 3 went out of service at 2:45 AM when the upper pool gauge reading was 17.5 feet. The river had crested sometime around 2:00 AM on November 6 with a crest of approximately 32 feet which was a rise of 16 feet in 24 hours. On November 7, 1985 at 7:00 PM the lock gauge reading was 17.5 feet for the upper pool which if the lock had not suffered electrical damage, it would have gone back in service. The lock would have been out of service for only 41 hours which I think was a very fast rise and fall for that amount of water.

For example, the Thanksgiving outage of Lock 3 in which the lock went out of service on November 27, 1985 at 11:45 AM with an upper pool reading of 17.5 feet. The lock was out of service for 72 hours with a water level that was 3.6 feet over flood stage. The river crested at 21.1 feet at 9:00 AM on November 29, 1985. This is, I think, is normal to have a three day outage during high water.

In regards to the November 6th flood, the rains started the previous week on Thursday and continued through the weekend. My experience with that amount of rainfall which fell continuously is that we were going to have a rapid rise in the river level. Upon checking with our watchman on Saturday November 2, 1985 the river was stable with no significant rise. Checking with the watchman on Sunday, I was also informed that the river did not rise significantly overnight. It did not seem right to me that at this point in time that the river was so stable. The terminal had a covered hopper barge at the dock and wanting to make sure that the barge would not break away with a drastic rise in the river, I called Lock 3 at Elizabeth and talked to one of the men on duty and asked about the river conditions above us. He informed me that everything was normal and were not making any unusual preparations since there was no abnormal rise in the river level. Again, it just did not seem right to me that at this point in time with the amount of rain that had fallen, the river was not rising fast.

On Monday morning November 4, 1985 I arrived at the office at approximately 9:30 AM. I put out the orders to get ready for the coming high water. This involved clearing off the lower dock, moving the crane and tool shed and anything that might be washed away, because the amount of rain we had in spite of what anyone says, from past experience told me that there was going to be extremely high water. All day on the 4th up to the time that I left for home a 6:00 PM there still was no large rise in the river. Lock 3 was still operating and I still could not understand or find out where all the water went for the amount of rain that fell.

On Tuesday morning I arrived at the office and found Lock 3 closed. We started to experience a rapid rise in the river. It continued to rise all day. Checking with personnel at Lock 3 to find out how much water they expected, they could not tell me except that the river was on the rise all the way back to the Cheat Dam. At noon I gave orders to center the covered hopper barge that was moored under our Number 4 building crane runway between the dock wall and the two support cells out in the river. This would allow the barge to rise without causing any damage to the building structure. At our 4:00 PM schedule meeting, our staff felt sure judging from past experiences that we were in good shape, the barge was secure and that sufficient preparations had been made to ride out the flood without any damage.

At approximately 8:00 PM with the water rising rapidly, we opened the covers on the hopper barge to allow more clearance under the building. This allowed the barge to rise another three feet. The barge could not be moved to the lower dock since it was sitting too high in the water to be moved out from under the building. The water was now going over the

center dock wall for the first time in the history of the terminal. We had no where to go with our barge. There were no tow boats in our pool to assist us. At about 10:00 PM Lock 3 personnel called to notify us that 16 barges had broken loose up river. We immediately went to the dock and put extra lines or break away lines on the barge. These extra lines would perhaps break, the second set of lines might break and hopefully the third set of lines would hold. The three sets of lines were of different lengths to take up the impact of the run away barges. Apparently the rumored barges that had broken from their moorings up river were those involved behind Maxwell Lock and Dam. At this time our terminal parking lot was completely covered with water and it was rising towards our new warehouse and was already inside the Number 3 warehouse. Dirt dikes were built around the entrances to the new warehouse keeping the water out. At 2:00 AM water entered the terminal office and amounted to two to three inches in depth. At this point in time the terminal was completely flooded with water. Lock 3 was contacted at this time to determine how much more water could be expected. We were concerned at this time that the covered hopper barge was running out of clearance with the building structure over the river. Our next move to save the barge and the building overhang was to start pumping water into the barge to increase its draft. We decided at this time that the river could not rise much further, it had already broken every record we were aware of and once the river overflowed its banks all the low land areas would take up the excess flow. At 3:00 AM we detected a small drop in the water level in our office and by 5:00 AM the water had fallen to a point where we could completely clean up the office. By 9:00 AM the water had fallen two feet and it was now possible to begin cleaning up the mud outside of the terminal. By noon the office secretaries were able to drive up to the front of the office and report for work.

Up to now I have given you some of my experiences over the 31 years at our terminal and the various high water episodes along with the flood of November 1985. It is appropriate at this time to go over the economic losses to the Dillner Storage Company, our employees and also our customers. The shutdown of Lock 2 due to sunken barges and large amounts of debris for a period of two weeks prevented barges from being brought in or out of the terminal. A total of six barges could not be loaded or unloaded by other means resulting in higher transportation charges to our customers, loss of revenue to the terminal and loss of wages for our employees. The closure of Lock 2 caused a delay to inbound barges coming up the Ohio River, one of which was diverted to another terminal. This caused added expense to the customer, extra handling and again loss of revenue and wages. A barge loaded with clay was delayed and held at the terminal for two weeks accruing demurrage. A lumber barge that was delayed resulted in our customer losing valuable time in getting the product to his customers. With the river closed, the Dillner Storage Company was unable to take spot business in either loading or unloading barges. Property damage to the terminal resulted in a four inch layer of mud, loss of telephone service and a flooded scale. Ground subsidence and the full effect of this flood will not be realized until the summer of 1986. Water damage in our warehouses to our customer's stored product resulted in wet lumber, paper and pulp which is stored under cover in a normally dry environment. Much of the product sustained extreme damage. Over \$150,000.00 in damages

was realized from loss of wages, revenue for the terminal and loss of customer's product.

This flood caused undue hardship for many along the river, both commercial businesses and civilians. A worse disaster could have taken place if the Allegheny and Youghiogheny Rivers would have flooded at the same time causing the Monongahela River to back up and rise further. Bridge close downs due to loose barges striking them stranded many people in the Pittsburgh area. The Maxwell Lock and Dam closure for 42 days resulted in economic hardship for many in the area due to mine closures.

In retrospect, the rapid rise and fall of the Monongahela River with no prior warning would lead one to believe that there was a lack of communications all along the river. Perhaps the loss of lives and property damages could have been minimized with an early warning system along the river downstream. In the future let us hope that we have learned to be better prepared against severe flooding. Thank you for the opportunity of providing input to this field hearing.

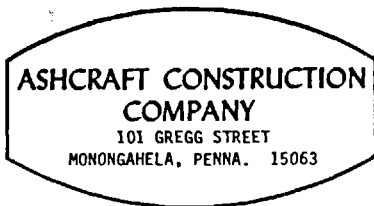
Very truly yours,

Andrew L. Millington
Andrew L. Millington

ALM/djm

Office: 258-5858

Residence: 258-3034



Mr. Errol Tyler
2165 Rayburn Building
Washington, D.C. 20515

February 3, 1986

Gentlemen:

My name is George W. Ashcraft. I am the owner of Ashcraft Construction Company. My business is located approximately 1,000 ft. off the Mon River, near the mouth of Pigeon Creek in Monongahela.

We have been operating from this location since 1970. I have worked out of this area since 1948, and I have probably observed every high water from that time until the present. Along with the construction business, I presently have a Mini-Warehouse business on this property. Elevation of all warehouse floors was established by the Corps of Engineers at the time each building was built. This elevation being 1 foot above the 1936 flood.

November 5th flood crested approximately 7" higher than the elevation given to me by the Corps of Engineers leaving me with water damages in all of the buildings.

The continuous rain we experienced before the high water started on Friday November 1, 1985. It rained continuously right through the weekend. On Monday morning, November 4, 1985, I immediately checked the Pigeon Creek level, which is something I automatically do after 2 or 3 days of rain. I was surprised to find it was not high at all. But at the same time, I recall a farmer who frequently comes to our place to pick up water for his cattle when his spring and cistern go dry. He had continuously picked up water each day up until Thursday, October 31, 1985. This leading me to believe that the majority of the rain had been soaked up by the dry ground, therefore, the rain did not cause much of a rise in the creeks.

Tuesday morning, November 5, 1985, approximately 5:30 a.m., I received a report over the police scanner that they were planning to close Park Avenue due to high water. I was surprised to hear this and at this point, I became very concerned as to where it was going to crest. I called the Lock & Dam #4 at Charleroi, at approximately 7:00 a.m. on the 5th of November 1985. The attendant at that time assured me there did not appear to be anything to worry about, it was

at 30 ft. then and they estimated it would crest at 35 ft. at approximately 3:00 p.m. on 11-5-86. With that news I came to work conducting business as usual. When the water reached a point that it had our road blocked off, I sent several of my employees home.

There are 2 elderly women living in a secluded area beyond my garage on a dead end road. I went back at approximately 11:00 a.m. to assure them that the water would not bother them, only to learn from them that they had word that the dam had broke. With that news we immediately started to make arrangements to get an ambulance to take the 97yr. old bed-fast lady out. It took approximately 1½ hours for the ambulance to get there. At that point it was impossible for the ambulance to drive to her home due to high water. We carried a stretcher from the ambulance on foot to the home, prepared the woman and carried her down the railroad tracks approximately 1,000 feet to the ambulance.

My questions are, when the weather bureau announced Friday that it would rain straight through the weekend, why did the dam hold the water so long before releasing it, and what condition took place to cause the water to continue rising after it reached the 35ft. mark that they originally felt it would crest changing the crest from 35 ft. to 45 ft. at Lock #4.

Also, why is a power company allowed to control this dam when the Mon Valley depends so much on this dam and its flood control abilities. If it came from the Cheat Lake, how long does it take for the water to get from Cheat Lake to Monongahela, approximately 65 miles away? Why was the rumor released that the Cheat Lake Dam had broken, then, secondly, why did a report come through to local police over the police scanner that the state police said the dam had not broken and the rumor was not true.

At 3:00 p.m. when the water was supposed to crest, but instead was still rising at a very rapid rate, we were unable to get any more reports from Lock #4, our telephone quit working, and the road coming into our place of business was already blocked off with water. Even though at that time our building and equipment was still high out of the water, we felt for sure from all of the reports, we were able to hear at that time, that the water was still going to crest before it reached our building. From 3:00 p.m. until midnight it continued rising. Not having access to a telephone and our only way of getting in and out from there on was with a small fishing boat. We relied on W.E.S.A., a local radio station, and a police scanner for information as to when it was going to crest. At 11:00 p.m. we were wading in water, working steady, trying to save as much as possible. When probably, the last report we had gotten came from a fireman out on the highway, who said it was still going to raise several more feet, and would not crest until 4:00 a.m.

We were suprised and relieved when midnight came and the water had crested. Looking back that night and from all of the reports we had received during the day, and how they varied so much, not once did we get a report of approximately when it would crest or at approximately what height it would crest, that was anywhere near accurate. If this water was dumped out of the Cheat Lake, by mistake why wasn't the locks up ahead notified to prepare for it, the boat

traffic stopped and the barge companies notified to secure barges and boats?

My damages amounted to approximate \$20,000 and if I could have had an accurate report anytime prior to 3:00 p.m. on November 5, 1985, I could have minimized my damages to almost nothing more than clean up.

Also, a report put out by the Corps of Engineers in November 1970 mentions a flood control dam a Rowlesburg, West Virginia on the Cheat River was authorized to be constructed and would have lowered major floods such as this one by 5 ft. to 6 ft. If this dam would have been built as planned in 1970, it could have saved the Mon Valley millions of dollars.

George M. Ashcraft

Mr. ROE. We now are getting toward the end of our witnesses. We have a citizen panel. I have listed Mr. T.D. Broadwater from East Millsboro, PA, together with Dr. Peggy Marcinek. Is that the correct pronunciation?

We want to welcome both of you to our hearing. And I suppose we have enough formal testimony, and we will accept that for the record. I think it would be profitable to summarize.

Suppose we take the lady first.

Dr. Marcinek.

TESTIMONY OF MARGARET A. MARCINEK, RESIDENT OF SPRINGHILL TOWNSHIP, PA; AND TED BROADWATER, RESIDENT OF EAST MILLSBORO, PA

Ms. MARCINEK. I would like to preface my remarks by indicating that my husband and I are natives of southwestern Pennsylvania. Our grandparents settled in the Mon Valley; and we, like our parents before us, were born and raised in close proximity to the Monongahela River. The river is part of our heritage. We were raised not only to enjoy its natural beauty and recreational opportunities, but also to understand and respect its inherent dangers. Thus, we approached the idea of building a home on the banks of the Cheat River with a mixture of enthusiasm and trepidation.

In 1974, while living in Morgantown, WV, we decided to purchase property in Springhill Township, PA. Because the property was adjacent to the Cheat River, we proceeded with caution. At that time, I contacted the Army Corps of Engineers and inquired about the potential for flooding. I was assured that the property was located in a 500-year floodplain and that the danger of flooding was practically nonexistent. Only then did we decide to build our home on that site.

Approximately 8 years ago, the Army Corps of Engineers requested permission to use our property as part of a study considering the installation of new locks on the Monongahela River. At that time, a flag indicating the high watermark, since the corps began keeping records, was pinned to the base of a tree on the riverbank behind our house. When I expressed surprise at the water level indicated, the surveyor assured me that the water could rise

an additional 15 to 20 feet before we would need to become concerned.

With this assurance, we continued to devote countless hours to our home. While my husband and I both work and earn a comfortable living, we are not wealthy people. Because we place such great value on home and family, most of our earnings were spent accordingly. The result was a beautiful home and grounds. We had achieved the American Dream.

After 10 years, our hopes, dreams, labors, and finances were invested to create a comfortable home and a secure future for ourselves and our child. All of that was lost on November 5, 1985.

On Monday, November 4, 1985, I returned home from work at approximately 5 p.m. I noted that the river was high, but not unusually so. The evening was spent with usual household activities, including watching the evening news and playing with my daughter in the basement family room until 9 p.m. Indeed, I was so unaware of impending danger that at 10 p.m. I began to compose my Christmas shopping list.

That evening, my husband had visited a neighbor, who also lives on the banks of the Cheat River. He returned home at approximately 11 p.m. and did not note any unusually high water at that time.

We were awakened at 2:30 a.m. by a telephone call from the Point Marion Volunteer Fire Department notifying us that our neighbor's home had water waist high in the basement. We immediately looked outside to check the level of the river. At that time, the water had completely filled the lower yard between our home and our neighbor's. Their basement garage door was submerged to a level above the handle. The river was higher than it had ever been in our 10 years of living in Springhill Township.

We then proceeded to inspect our basement. At this time, I would like to note that our basement has never had a drop of water in it. Indeed, it was so dry that 4 years ago we confidently finished the family room, laundry room, and bathroom. We stored all of our sporting equipment, off-season clothing, canned goods and freezers in the basement.

Our estimated loss of personal property located in the basement alone is \$30,000. This point is made to illustrate that our basement never flooded; in fact, it was never even damp—that is, until November 5, 1985.

When we entered our basement at 2:30 a.m., on November 5, it was essentially dry. Two corners had some moisture, but no measurable amount of water. By 2:45 a.m., the water was over my ankles. As the water poured in, we began to move clothing and furniture upstairs. At approximately 3:15 a.m., a State policeman came to the door and strongly encouraged us to leave. He stated that the water was coming over the top of the dam, and that if he were us he would leave.

By 3:30 a.m., I had packed some clothes and took our daughter, our cat, and our neighbors to stay with relatives in Uniontown. My husband stayed behind in a futile attempt to salvage some possessions by moving them into the garage.

At 5:30 a.m., the water had reached the level of the dog pen, forcing my husband to remove the dog and leave. He returned at ap-

proximately 9 a.m., hoping to retrieve our camper and other items. By that time, the roads were closed and he was unable to reach our home, which was completely engulfed. The water continued to rise until it reached the roof of our home.

Since we had no prior warning and little time to act, we lost everything we owned: family heirlooms, antiques, photographs, book collections, cherished toys, furniture, appliances, a camper, and a barn with all of its contents including a riding lawnmower.

That the dam was opened without any warning to local residents is not an unusual occurrence. The dam is opened almost daily, and frequently several times a day, for purposes of power generation. No warning signal is in place to notify residents, swimmers, boaters, or others that the dam will open.

The current produced by the opening of the dam is quite strong. Several years ago, while we were in the process of building a boat dock, the dam opened and the current washed away a pier which weighed approximately 1,000 pounds. Fortunately, we were able to retrieve it by boat.

On at least three occasions over the past 10 years, youngsters have waded from Point Marion to an island in the Cheat River. The dam was opened and the water level rose rapidly, stranding the children. On one of these occasions, we attempted a rescue by boat—a 14-foot outboard—and the boat was unable to overcome the current. In that instance, and in the two thereafter, we called to those stranded on the island and advised them to remain there until the current stopped and the water level receded.

In reviewing the events of November 5, 1985, two important points need to be emphasized. The first is the lack of information and warning about potential flooding. On Monday evening, November 4, I listened to the evening news and weather. While the weather forecast provided flood warnings for small streams and low-lying areas, no warning was issued for those of us residing along the rivers.

Related to the above is the lack of notification of actual flooding by any official agency or responsible party. As previously described, we were strongly encouraged to leave, by a State trooper. It is my understanding that two State officers were making a routine patrol that night and, by chance, happened to drive along Nilan Road at 2:10 a.m. They noted the extremely high water and then notified the Point Marion Fire Department. After the fire department investigated, we were then unofficially advised to evacuate.

This chance patrol by the State police perhaps saved our lives. We have yet to receive any official notification of imminent flood danger or any recommendation to evacuate. This lack of notification was quite costly in terms of personal property damaged and/or lost. It could have been inestimably more costly in terms of human life had it not been for the random patrol of those two State troopers.

It is imperative to note that major flooding had occurred in Parsons, Albright, and other areas of West Virginia on Monday evening, November 4. It appears that someone should have recognized that the wall of water that decimated these towns would continue its rampage downstream and eventually enter Lake Lynn. That would pose an immediate threat to those of us who live a

short distance—that is, 1 to 2 miles—below the Lake Lynn Dam. Had we been informed of the potential for flooding as late as 10 or 11 p.m. Monday evening, we could have saved thousands of dollars in personal property and immeasurable amounts of grief and anguish over sentimental losses which defy price tags.

In 1985, I seem to have somehow lost my past. The year began with the death of my father and ended with the loss of my home. It appears that, in 1986, I am being robbed of my present. I currently spend my time cleaning, scrubbing, painting, and repairing items damaged in the flood. When I am not thus occupied, I spent the remainder of my life filling out forms and applications, documenting losses, and, in short, being harassed by Federal agencies which are supported by my tax dollars.

Because my husband and I are both gainfully employed, are middle class citizens, and carried flood insurance, we find out that we are not eligible for most types of aid for flood victims. But even more distressing is our inability to collect our rightful settlement from the National Flood Insurance Program, due to their ineptitude and incompetence in processing claims.

We continue to pay our taxes and insurance premiums, but we have yet to receive any type of assistance from Federal, State, or local agencies. And until we receive our insurance money, I will have no present to speak of. All I have left is the future, and that remains shrouded with doubt and mystery. But we will recover, because we are the stuff of which America is made: hard working, responsible, spirited survivors.

It is unfortunate that those of us who demonstrate the very essence upon which America was founded are the ones who are ignored by Federal programs. After all, we are the ones upon whom the future of this country depends.

I implore you to help us recover so that we may continue to contribute to society in a meaningful way.

Thank you.

Mr. BROADWATER. Mr. Chairman, I am Ted Broadwater. I retired from the U.S. Air Force a couple years ago and built a home along the river. Maybe I should have waited until 1986, but I didn't, so I am here not only as a victim but representing Luzerne Township and many of the victims from that township.

We do appreciate you being here. There are many, many questions on this flood. Maybe you can find the answers. We haven't been able to.

I can assure you, though, that we are not yet ready to accept that this flood was purely an act of God. There are too many unanswered questions.

Floods are bad enough anywhere, as we all know, but especially troublesome in this area. The impact on our folks was very traumatic because we are in a very, very high unemployment area. We are in an area that has a population where the average age is much higher than the national average, because our young folks can't stay here. They can't find jobs here, the mills are closing, the mines are closing, so they have to go move south. The people that were impacted by the flood to a great degree were older folks.

I just sampled the population of one town in my area. There are 27 families there; 8 of them are retirees living on Social Security,

or some small miner's pension; 7 of them are widows; 3 of them work part time; 7 are unemployed. And only 3 out of 27 have a full-time employed member of the family.

In our township we had 105 homes affected by the flood; 9 were totally destroyed; 90 had major damage, and the remainder suffered minor damage.

I would like to make two points up front, if I might. I have submitted testimony, Mr. Chairman. I would like to summarize a couple of points that were discussed here today. The first one is the issue of warning; and the second one is, even if we have received the warning that we think we should have received the inaccurate information that would have been passed to us through the warning system wouldn't have been very helpful. If I can concentrate on those two points.

Like the doctor, I received no warning until I got up the morning of the flood. I happened to be a candidate for office and that was election day. I got up at 6:15. My warning was 6 inches of water on the first floor. By 7:30, which is 1 hour and 15 minutes later, I had 4 feet.

This is very difficult to understand after reading the histories of what happened up in West Virginia; where a couple towns were totally wiped out some time on the 4th. And yet, receiving no warning whatsoever until you get up and find 4-6 inches of water in your house.

And while I am reflecting some of my own personal instances, I don't think my experiences were unique. I think they represent the flood circumstances of most of the folks in the area.

Now concerning, the inaccuracies of the information we received. As soon I found water in the house, it seemed logical to call the Maxwell lock, which I did at 6:30. At that time, the information they had was that the river would crest about 10 a.m. So that didn't seem all that bad, although I apparently was going to get flooding on the first floor.

In retrospect, we reviewed the National Weather Service forecasts on the day of the flood in our area, which was on November 5, election day. Up until 10:30 a.m. that day, the National Weather Service was forecasting just 2 to 3 feet above flood stage. Well, that 2 to 3 feet wouldn't have affected many of the houses in our area; in fact, very few at all. We had that much water just recently with the Thanksgiving Day flood.

What I am trying to portray here is that warning system was ineffective. But if we had received adequate warning, it would have been based on inaccurate data.

I talked to the locks again about 10 o'clock. At that time, they were predicting a 1 o'clock crest, then later a 3 o'clock crest. The river eventually crested at 6 o'clock that night. The information being received couldn't be depended upon.

Some of the other inaccurate information we received has already been discussed, and I won't expand on it much. But the fire department in our area asked us to evacuate because the Cheat Dam had burst. Of course, we had to evacuate our homes because of that, and consequently didn't get to save much except a few personal belongings.

I would like to talk now just a little bit about what I think was a very strange profile of this flood. I tried to do my homework by talking to folks up and down the Monongahela River that have lived here their entire lives. It is difficult for any of us to imagine going to bed Monday night and having a normal river and having our houses flooded on Tuesday morning.

As you know West Penn talked about preparing for the flood by releasing water through the tunnels on Monday. It couldn't have helped much because the river was normal on Monday night, and I think the gauges will reflect that.

Please visualize getting up at dawn on Monday morning and finding the river about 12 feet of water above normal, and up about 20 feet by noon. Then by 6 o'clock that night about 24 feet, a massive avalanche. Then Wednesday morning almost back down to normal and by Wednesday evening below normal. That type of profile leaves a lot of questions.

I believe there was something happening with the management of the floodwater upstream that caused the water to come that way. Heavy rains may have caused all that water, but whether we had to have it in that magnitude, that quick leaves a lot of questions.

Then we read the Cheat Lake was empty on November 6 and that the dam was left unattended on November 5, and wonder if that impacted our area.

I was glad to hear the testimony from the corps on the Tygart Dam. I have been asking questions, and the only answer that has been forthcoming to this point was that the Corps of Engineers said they followed the normal procedures at the Tygart Dam. We are glad the hearing expanded upon that explained.

The question of the barges has not been covered here except by Supervisor Atz, and I think that deserves a good bit of attention. How do some 60 barges get loose on this river to terrorize the people downstream? It did terrorize us. I got out of my house. Those barges came past Arensburg, my hometown, about 9:30 to 10 o'clock on the 4th, at that time I was trying to get what I could out of my first floor up to the second floor and stacked. It turned out to be a futile effort because everything got turned upside down when we got 5 feet of water on that floor.

But those barges, when you are in your house trying to save something and you look out and see loaded barges coming down the river, it is not very smart to stay in the house. The water was surrounding my house at that time, and one of those barges took out three trees about 30 feet from my house.

We have discussed nothing about the responsibility for those barges. That is something that certainly needs attention. Not only did it force people to get out of their homes, but as Supervisor Atz discussed it caused a backwash of water at the Maxwell Dam that poured into our township, pushing water in the houses in our area.

The corps says the locks are strictly for navigation. Our folks contend that during the time that the locks were being justified and publicized in our area, that while they were primarily for navigation, there was some justification passed to our citizens that they were also for flood. We would certainly ask your staff if they would look back at the original justification for the Maxwell locks and see

if they were justified strictly on a navigation basis. In some of the floods that we had during the time before the Maxwell locks were built, and during the time they were being built we were given the impression that the locks when completed would be able to help manage future floods.

I have talked about the National Weather Service teletypes, and I have reviewed all of them. As is mentioned, the first warning of any serious water was with the message of 10:40, on the 5th. That was way too late.

As far as the emergency organizations are concerned, Sir, the system just isn't responsive. You have not talked much about FEMA and PEMA and EMA today. And I would like to leave some thoughts with you, if I may.

First, I don't see how you can manage an emergency with the current mindset of the emergency agencies. You need some people on the ground within 12 or 24 hours after an emergency happens, not sitting in Washington waiting on a proclamation or in Harrisburg waiting on a proclamation.

If I can be so vain to say so, if I was running FEMA, I would have a cadre of trained people on standby. The first time I heard of an emergency out in the Conus, I would get some people out into that area. That didn't happen. We didn't get people in the area until 8 days later after the flood.

I think it is a misnomer to call yourself an emergency management agency when that is the type of response you provide.

We needed help here, early in the emergency, let me cite some of the things—that if we had had some trained people here, how they could have helped.

The day after the flood, at the latest, we would have been able to tell the people what they could expect in the way of help in grants and loans. That information was not available. Supervisor Atz did try to find out what we could expect and what we could tell the people, but there was nothing to tell them. So, someone in place and trained could have done that.

Then, small things, like what do you do when you get 5 feet of water in your \$12,000 kitchen? What do you do to a refrigerator that has been flooded? Do you turn it back on as soon as you can, or do you leave it dry out or spray it with silicone or take a hose and wash it out? No one knew.

There was a lot of questions about, what to do with a house after the water goes out. Can you save the rugs or can't you save the rugs? Should you put heat on it? Should you not put heat on it? Should you put on humidifiers? None of these answers are available when you get into a situation like we were in here. These are important questions I have asked. You couldn't get answers because no expert was available.

Then the rodent problem. We needed to be told that a flood chases rodents all out of the river banks and up to the house.

So, in conclusion, I would say there was many, many questions that haven't been asked, and we would like to keep asking until we get the answers. Certainly your committee, Mr. Chairman, is going to be very helpful in that respect.

With warning and some accurate information, we could have saved much of the personal property that was lost in this valley. In

my case, I had some structural damage, but the damage was mostly to my contents as is true with most victims.

Who is in charge isn't clear to any of us. We look around and we see the Corps of Engineers, West Penn, National Weather Service, county government, FEMA PEMA, EMA, sheriffs department, township police, State police and State government, and everybody says they did their jobs. But when it comes right down to it, we didn't get a warning, and we didn't get the information that we needed to mitigate the circumstances of this flood.

So we say if the system isn't working, it should be changed. And we would look to you to try to help us do that.

Thank you, sir.

Mr. MURPHY. The only one I would have is, Dr. Marcinek, if you would want to provide my office with the information on your flood insurance, I have been in touch with that agency.

Ms. MARCINEK. I have.

Mr. MURPHY. I will make sure that they give that to me before I go back to Washington next week. I will call them. I have called them for seven different people. And I agree with you. They are very, very dilatory in settling claims. It is almost unheard—this is 3 months later and they are not settling the claims, especially when you have been paying premiums all those years.

Mr. ROE. Especially when we don't qualify for anything else, we are in worse shape than anyone. By having flood insurance we are in worse shape than people who didn't at this point.

Mr. MURPHY. I agree with you.

Mr. ROE. Well, I think we have covered all of our witnesses. We want to thank you very much, both of you, for your statements.

I am going to ask a question. I don't want you to applaud, I don't want you to scream out. People in this room are experienced with FEMA. You know our mission here is to ascertain the facts. That is what we are here for, to find out exactly what has happened. I don't know what your experience with FEMA has been, but I know our experience in the Passaic River basin was abominable. The only way we could get anything done frankly, is on a case-by-case, one at a time basis, and you have to bicker and fight to get something achieved, which is just patently unfair. I think that is the point you are making.

So, we were talking about that a little bit before. We will call FEMA in for testimony in Washington on this entire case, and believe me, we will get to the bottom of exactly what the situation is.

It also seems to me, No. 2, is to coordinate what is the situation and get that to us through Congressman Murphy or others in your own area as to what is going so we can in candor put the heat on them down there to get to work on these cases. That is the only way. They will drag it on for 1,000 more reviews and the whole bit, meantime nothing is getting achieved. So we will develop that.

The second thing that I would like to report to you, is that while I was trying to develop the whole point of notification—we know it was an extraordinary event, a 100-year flood, one thing to point out is we can't be foolish thinking it couldn't happen again, because it could. I think that the thing we have to do is to strengthen immediately the whole notification process.

I think, as you, Doctor, pointed out, and Mr. Broadwater pointed out, and everybody else, if that data had been available to us on a usable basis so it made sense, other things that could be done in some kind of a notification as to what can be done, helping different things. We have one case where an electric wire was involved. Somebody could step into the water and be electrocuted because they weren't aware of the kinds of things they were exposed to.

In candor, from the testimony—which I think has been splendid from everybody today, it appears there is no coordinated level. Who is responsible, who is in charge to sift through the data available and make sense of it as it goes along. So that is obviously something that we are going to have to look into to be able to require that it be done in a coordinated basis by putting something in charge. I think that makes a great deal of sense.

Finally, the other point I want to make, it seems to me as we sift through the testimony that the corps gave us today, and others, we get to the point of saying that there is a lot more that could be done on flood proofing in the area. It seems to me that, again, as Congressman Murphy pointed out earlier, that we go back to that legislation now, which is pending, and say that this ought to be re-reviewed to determine what can be done at different levels to go on with a program. It is not going to be just one dam that is going to achieve this. There is a series of things that have to be done in the whole Basin to be able to provide the kind of protection, the flood proofing that we are talking about, and we will move in that direction.

Let me make one admonition as a citizen, not as a Member of Congress. For 25 years we worked on a flood control program in the Passaic River basin, and every time we turned around with a plan that was devised—no plan is ever perfect—we came back to a group at this town or a group in that town, and they came back and said no, because we lose ratable or this will happen to us and we don't need it, and it doesn't affect us.

Now, in candor, it is going to take local leadership to come back and say as this program unfolds, that there be a coordinator in the Basin and that might be something you could get to work on right away; coordinating people and saying we have to get on this. There has to be sacrifices. People have to work jointly to be able to achieve the goals that both of you have testified to so well this afternoon.

We will move in that direction, we will move in the direction of a re-review, and I think members would agree with me on this issue of the engineering that is involved. We think we may have enough authority now without additional legislation. If we don't, as was said by Bob Wise and Austin and myself, and we need additional authorization, we will work to get that authorization to get this done.

Get us the data, coordinate it through Austin, and on your FEMA bit, we will have a hearing with FEMA in Washington. We will have that hearing to further get into this matter and to find out exactly what happened.

And I think the third leg of the situation is to coordinate a better Federal and State notification system so we can be on top of this situation so it doesn't happen again.

Mr. Clinger.

Mr. CLINGER. Thank you.

Just following up on a couple of things you mentioned. I think clearly the purpose of our hearing today was to consider preventive measures, what we could do, what could the Public Works Committee initiate which would have an impact on preventing the kind of disaster that we had here last November. But as we have heard today, this whole business of notification and response is a very big part of what has happened here, and I think it is fortuitous that the Public Works and Transportation Committee has under our jurisdiction FEMA, and the fact that we will now be able to explore FEMA's role in more detail.

I have a personal feeling about that because in my own district, in places like Oil City, Tinesta, in Pennsylvania, we had some devastating tornadoes in June, and again we were faced with, well, in fact, a great loss of life—23 people in my own district lost their lives and many people were left homeless.

The response by FEMA initially was outstanding. In our case, they were there, they arrived very promptly, were on site, but follow-up has been weak. In other words, we have had great difficulty getting individual cases resolved in a timely fashion. I think it is incumbent upon the committee, since we do have jurisdiction over FEMA, to begin to look at that.

Finally, I would like to express my thanks to Austin Murphy for inviting the subcommittee here. I think we have had some outstanding testimony, and we can take this back to Washington and I think put it to good use.

So, Austin, thank you very much for having us.

Mr. WISE. Austin, I also want to thank you. This hearing, as I say, could have been anyplace in the Third District of West Virginia, or the Second or First District of West Virginia actually, and as I said when we first started, this fire hall could be in Weston or Glenville or Burnville and the people would be saying the same thing.

What about the FEMA role, and not only beforehand but afterward? As Congressman Clinger so aptly put it, what I see in my district is the initial role is good. A disaster center is set up. That gives people something to relate to. It is what happened after, which you, Doctor, have testified to.

In my district what happened with SBA loan applications? We are waiting for personnel assistance plants. Our towns are waiting to see whether or not the cleanup expenses that they thought would be reimbursed indeed will be reimbursed.

I am very encouraged there will be a hearing so as we look at not only flood control, apparently we are also looking at FEMA control, and happily both are under the jurisdiction of the Public Works Committee.

Congressman Murphy, through your leadership, you have opened up two lines of inquiry that benefit not only constituents here, but constituents in West Virginia. Thank you.

Mr. ROE. Congressman Murphy.

Mr. MURPHY. Thank you very much, Mr. Roe, Bill Clinger, and Bob Wise, or the time that you have given here today and to come in such weather and in such travel conditions. I want to thank ev-

everyone who came and participated, all of the witnesses, who have shed more light on this today than any of us have had up to this point.

I want to thank Mr Roe, too, because he indicated to me yesterday in our discussions that he would give us a separate hearing on FEMA. As you all know, that are in the flood area, there have been thousands and thousands of people who have gone into the FEMA centers and the thing we want to ask them is what they have done to date, why did it take so long, is there legislation needed?

There are so many problems. Bob and I have been living with this for 3 months. I regret that we cannot hear from everyone here today, but if you will submit to any one of my district offices any written statements that you have, I will request Chairman Roe to make them a part of the record when he convenes the hearing in Washington, DC, related to FEMA. We will also notify our local residents and officials of the date of that hearing and I will prevail upon him to hear some of our people at that time who can journey there.

In the meantime you will submit your written statements to us, we will have them photostated in the required number of copies to satisfy the committee, and we will ask Mr. Roe to make them an official part of the congressional hearing, so that hopefully, we can prevent this from every happening to American citizens again.

Thank you, Mr. Roe, for your courtesy.

Mr. ROE. Well, may I conclude, ladies and gentlemen, by first thanking members of Congress and the committee for coming. I want to thank all the witnesses for a splendid presentation. It was clear and concise. We understand the situation. I would urge any of you that have an immediate problem to take it up with Austin and we will do what we can at our level down in Washington to follow up from there. We will hold the hearing for FEMA and do all we can to be of help both in the short range, getting these matters resolved and by the same token, the longer range situation.

I want to thank you very much. Be assured of our interest. We thank you very much.

[Whereupon, at 1:50 p.m., the subcommittee was adjourned.]

[Mr. Broadwater's prepared statement follows:]

Mr. Congressmen, my name is Ted Broadwater. I retired from the United States Air Force in 1983 and returned here to Fayette County and built my home along the Monongahela River. I'm here today as a victim of the flood and a representative of many of the people in Luzerne Township who were also victims.

First, I would like to thank you for coming here during your investigation and for showing an interest in finding answers to the questions concerning the November 5th. flood. I will try to raise some of the questions that are bothering the victims from my area.

A flood anywhere at anytime is a disaster when it hits a populated area. This flood was doubly unfortunate in that it struck an area already ravaged by closing mines and mills causing an unemployment rate more than triple the national average. In addition, a high percentage of the victims were old people living on social security and/or miners retirement. There were fewer young people involved. Due to the lack of employment opportunities, many of the young people have moved out of the area.

But Mr. Congressmen, let there be no doubt in your minds about this area surviving this flood. We will. Those of us involved have seen the tremendous outpouring of help from our friends, relatives, and neighbors. From the charity organizations such as the Red Cross, Volunteer Firemen, Catholic Charities, Salvation Army, and others like the Ministerial Association from the area. For all of them we are deeply appreciative and would like to thank them publicly. With people who care and love their neighbors as has been expressed in our area how can we fail?

While all of us are doing our best to get back to a normal existence, we are not willing to accept everything we have been told concerning the causes of the flood. There are too many unanswered questions to have us accept the flood as solely an act of nature. We are looking to you as elected representatives to provide the answers we are seeking.

In our township 105 homes were effected by the flood. Of these, 9 were destroyed, 90 suffered major damage, and 6 had minor damage. In addition to the structural damage, most of the families lost their personal property. This loss of personal property could have been substantially reduced if we had received adequate warning, and accurate information during the time the water was rising.

Speaking for myself. I received absolutely no warning of impending water until I already had 4 feet of water in my basement. My case is not unusual. In fact, I have yet to talk to anyone in our township who received any warning of the flood before the daylight hours on November 5th. This was true even though two towns on the Cheat River in West Virginia were virtually destroyed by rising waters at approximately 01 30 AM that morning.

At my home, I had approximately 6" of water in my first floor when I woke up at 6:15 AM on November 5th. In a little over an hour at 7:30 AM I had approximately 4 feet of water. This rapid rise prevented me from salvaging but very few items from that floor. The exasperating part of this problem was that given time and accurate information I could have saved most of my personal property.

I called the Maxwell Lock at approximately 6:30 AM and was informed that the water was rising but was expected to crest at 10 AM. (The river finally crested in my area at 6 PM that night.) In view of that information I moved as much as possible from the first floor to the second floor and took action to stack items on the second floor in case the water did get that high. During the time I was trying to secure my personal property I was forced to evacuate my home because of runaway barges in the river.

The river at that time was already around my home and I was forced to evacuate (by boat) in case one of the barges struck my home. In fact a barge nearly did just that, taking out three trees which were approximately 30 feet from my home. In addition, the volunteer firemen, having been alerted through their emergency radio, asked my family and I to evacuate the valley because the dam at Cheat Lake had broken. (Which later proved to be a false alarm). Consequently I was unable to save anything in my home except a few personal items.

My experience in trying to save my property was not unique. The same circumstances occurred with most of the families; no warning, no time, the barge threat, inaccurate information on expected water levels, and the dam break rumor.

The task of trying to save our personal property was made difficult without warning of the coming flood, but became impossible with the rapid rise of the water. As I mentioned earlier, the water rose in my home from 6 inches to 4 feet in a little over an hour. The water then rose to a height of 1 foot on the second floor by noon that day. It finally reached a height of approximately 5 feet on the second floor by the afternoon of the 5th. Please note that the water was then 12.5 feet above flood stage even though the best information available earlier that day through the National Weather Service was that the river would crest at 2 feet above flood stage.

The sudden avalanche of water raises questions concerning water management at the Cheat and Tygart Dams. We have read that Cheat Lake was almost empty on the morning of November 6th. If that is so, it indicates no attempt was made to control the water flow down the Monongahela Valley. In fact, by dumping the lake it added to the water volume in the valley below the lake. The method of operation of Tygart Lake during the crucial early flood hours is unknown other than to accept the Corps of Engineers words that they followed standard procedures at the dam. We believe we are entitled to an explanation from both the Corps and West Penn on what exactly did occur during the November 5th. flood at those two facilities.

Other questions on the rapid rise of the flood water concern the function of the locks and dam on the river, the pile up of the barges at the Maxwell Dam, and whether the up-river rainfall was being properly monitored.

While we had rain for the few days preceeding the flood, the rain we experienced did not raise questions on the potential of the river flooding. We read, however, that the rains in West Virginia were extremely heavy resulting in the flood we experienced. If the rains were so extraordinary why did the National Weather Service not recognize the pending flood danger until it was too late? What do the historical weather records indicate on rainfall of this amount? Was this rainfall a one in a hundred year event as the flood has been characterized?

We note with interest the contention of the Corps of Engineers that the lock and dam systems on the Monongahela River are solely for navigation purposes. That is interpreted by us to mean the Corps has no responsibility for flood water control or management on the river. We anticipate your investigation will delve into this question of Corps responsibility. Specifically we question whether the locks and dam on the river aren't functioning to reduce potential flooding further down river in areas like Pittsburgh. We note that Pittsburgh had very little damage from the flood water that devastated our area. Would we have had the same damage had the Maxwell Lock and Dam not been built? Most of the people who have lived on this river for years believe not.

The rapid rise of the river may have been accelerated by the pile-up of the barges at the Maxwell Lock and Dam. The residents up river from the dam in towns like Maxwell and East Millsboro firmly believe their water level was impacted by the blockage of the dam by the barges. In matter of fact, the river gushed back up-stream when the barges hit the dam blocking many of the gates. The back-flow of the water is an indication that the barges did in fact contribute to the rapid water rise above the dam.

The time profile of the flood also raises questions on the water management system on the Monongahela River. When we went to bed on November 4th., the river was normal. By dawn on November 5th. it was over its banks and rising and by evening it had crested 12.5 feet above flood stage. The next day, on November 6th. the river had fallen dramatically and was almost back to normal by that night. The question is whether or not the water could have been released more evenly up-river? Could Cheat and Tygart Dams have been drawn-down on November 3rd. so they could have held back the flood water they obviously knew was coming on the 4th. and 5th.?

The most frustrating part of this entire flood episode is that it's effects could have been mitigated if the in-being warning systems and information systems had been effective. It seems to be a case where no one was in charge. The flood has passed but it hasn't been forgotten here in Luzerne Township. We view the infrastructure of the Corps of Engineers, the National Weather Service, Emergency Management Agency, the County and State Government, the Utility Company, PEMA and FEMA, and wonder where our tax dollars and utility dollars are going. Surely with all these entities available we could have been warned that flood waters were coming and at what level. If the current system doesn't do that, it should be replaced with one that does.

Thank you for your attention. We all wish you good luck in your pending investigation of the flood. We eagerly look forward to the results.

Ted Broadwater
R. D. 1, Box 50 A
East Millsboro, PA. 15433
412-785-4336

ADDITIONS TO THE RECORD

STATEMENT OF HON. HARLEY O. STAGGERS, JR.,
A REPRESENTATIVE IN CONGRESS FROM THE
STATE OF WEST VIRGINIA

Chairman Roe and Members of the Subcommittee on Water Resources, thank you for inviting me to testify before the subcommittee regarding the devastating flood that occurred in the Cheat and Monongahela River Basins on November 5th and 6th, 1985.

Let me take this opportunity also to thank the people of Point Marion for allowing us to use their facilities to hold this hearing.

The floods that occurred in early November 1985 have been characterized as the worst disaster in the history of the State of West Virginia. In visiting the flood ravaged areas during and shortly after the flood, I can say from personal observation that I have never witnessed a disaster as extensive as this. It will take a very long time for the residents of the Monongahela and Cheat River Basins to rebuild their homes, their towns, their businesses and their lives. Indeed, some will never fully recover from this dreadful occurrence.

As the people and communities along the rivers begin to rebuild for the future, we must also begin to look to the future. We must work to assure that these devastating floods do not occur again. In doing this, I believe it is incumbent upon us to consider the wishes of the people who live in the region that will be most directly affected by efforts to prevent or control floods in the future. With that in mind, I would like to include a letter I have received from Mr. Roger Bonner and Mr. John Lambert, County Commissioners from Tucker County, which presents the view of Tucker County regarding flood control measures. As a point of reference, Parsons, one of the towns hardest hit by the flood, is located in Tucker County.

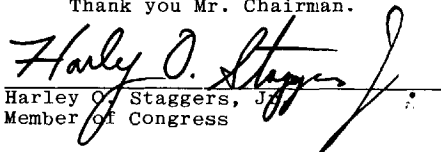
In addition to receiving this letter, I have also spoken to numerous residents of other areas hard hit by the flood. These citizens have advised me they would like to see Congress appropriate funds to conduct a thorough study of the problem of flooding in their area. I can assure you they are as concerned as you, if not more concerned, that the Federal government assist in future flood control. However, they don't want a cure which is worse than the illness. Let us make sure we approach this problem in a reasonable way, considering the families and farms upstream as well as the businesses and industries downstream.

Mr. Chairman, the message seems clear to me. We must study the issue of flood control in this area carefully. The facilities must provide optimum protection with a minimum of disruption to those in the flood control area.

In closing, I would like to urge the members of this panel to listen and carefully consider the testimony presented here today. I believe we need to study the feasibility of flood control projects along the Cheat and Monongahela Rivers. The projects must provide a maximum of protection for all involved, including those in Rowlesburg, Albright, and Parsons, as well as locations downstream in Pennsylvania. I do not believe this protection should come at the expense of homeowners, farmers and other residents of my Congressional District who might be displaced by flood control facilities.

The facilities should be in harmony with the lifestyles of my constituents so all concerned may derive maximum benefit and enjoyment from the security flood control projects will provide.

Thank you Mr. Chairman.


Harley O. Staggers, Jr.
Member of Congress

February 4, 1986

The Honorable Harley Staggers
 U.S. House of Representatives
 1229 Longworth Office Building
 Washington, D.C. 20515

Dear Congressman:

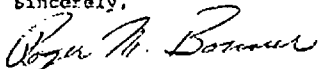
This is to inform you that the county of Tucker strongly opposes the construction of the Rowlesburg Dam. This would be a liability to our county instead of an asset. The following are just a few of the reasons why this project would be detrimental to our county.

First of all the dam would cover the best farmland in the entire county. Thus this would take a large portion of the county's now limited tax base. No taxes would be paid on this land nor on the livestock presently located there nor on homes.

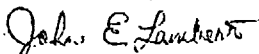
It is very hard for us to comprehend the use of over four million dollars of government funds to build this project when here in the same vicinity we have a proposal to build the same sort of project but with the use of private funds. Some of the excuses for the construction of the Rowlesburg Dam have been the providing of hydroelectric power and recreation. But the other project, The Davis Power Project, would provide these as well.

We feel that other and smaller dams would be far more beneficial to this county and all concerned down river pertaining to flooding.

Sincerely,



Roger M. Bonner
 Tucker County Commissioner



John E. Lambert
 Tucker County Commissioner

TESTIMONY: Bob Sunny
33 Playford Avenue
Brownsville, PA 15417

Subcommittee on Water Resources
Congress of the United States
Point Marion, Pennsylvania

Friday, February 7, 1986

Gentlemen:

At the request of The Honorable Austin J. Murphy, dated January 22, 1986 inviting me to give written testimony to the Congressional Subcommittee on water resources concerning the devastating flood which occurred November 3, and 4, 1985 in Pennsylvania and West Virginia, please accept the following:

My name is Bob Sunny and reside at 33 Playford Avenue, Brownsville, PA 15417. This has been my home for (51) years and I have always been concerned about warnings or alerting people so that they may have a fighting chance to save a life and property.

This type of warning interested me, since the outbreak of World War II when I learned about the Civil Defense siren and our fire whistle. I have served (8) years in the United States Air Force, working with and supplying communications systems for the United States and other Foreign Services.

I have a sincere knowledge about alerting people in case of premature danger or disasters. Some of my experiences include (2) years on Guam; center of Pacific receiving and transmitting. (JASPAC) (1) year, Washington, D.C.; Brandywine receiver site. (2) years in the Phillipines; 1st mobile communication deployed to United Nations Security Forces, in New Guinea for the Indonesian and Dutch transfer, working under a Canadian Colonel, Wing Commander Herbert, and with General Said-u-khan of the 1,000 man Indian Police Force. I supplied communications with a 1000 watt radio station, contained in two samsonite suit cases and recieved U.S. commendation medal for the meritourous achievement. Also, deployed to Chanig-Mi Thailand, to supply communications with Jusmag and the British Hawker Hunter Aircraft, stationed there. I lived with Dutch military during this campaign. Shipped to Viet-Nam, for field action in Danang, Saigon, An-kay and Quin-yon. Deployed to Co-ong with a special unit, 100 miles off coast of Saigon. Worked at Olmsted AFB

TESTIMONY CONTINUED: Bob Sunny
Friday, February 7, 1986
Page 2

Harrisburg, at special units with Geeia Installations, which deployed me to install the first dual weather facility at Suffolk Co. AFB, L.I., NY and then back to Washington, D.C. to work on the Flight Line Glide Slope at Andrews AFB, and back to Maine to install equipment for B-52 Bomb range testing.

After the USAF service, returned to present address, 33 Playford Avenue, Brownsville, PA and built (6) cable TV (CATV) head ends and engineered (6) communities; Brownsville, Uniontown, etc., with cable TV.

I belonged to the Fayette County Fireman's Association and was instrumental in changing the 20 watt C.D., World War II radios, for the Fayette County Fire, to 100 w, 4 channel capacity transievers.

I was a member of the Brownsville Volunteer Fire Department until I became disabled in 1972, due to a work related accident and injury, and have been put on the inactive role with the Fire Company although I still desire information for safety along the river and communities. In 1977, I wrote a letter to the United States Army Corps. of Engineers, to gain information on what could happen in case of Cheat Dam Failing. A copy of this was answered in the attached letter, dated November 10, 1977, from the Allegheny Power Service Corporation. This letter was requested to be sent to me by the United States Army Corps of Engineers, Mr. Hank Edwardo, November 10, 1977. After the disaster occurred, I sent a letter to the Pennsylvania Governor Thornburg, requesting a better warning system. The Governor's office sent the letter to Pennsylvania Emergency Management Agency, this letter is also attached.

I wish it to be known, I am not at this hearing for any personal gain of publicity or exposure. Also, I am not here to cite or criticize any Company or person. Believe me, all I want is better communication and a better warning system and I will keep on working on this until some realistic measure is completed, locked in and set into motion.

This situation of a warning for fast flooding can be compared to Bo-Phal India, Union Carbide, W.VA, Three Mile Island, PA. But cannot be justified by using only sirens in a small enclosed area. We are talking and looking

TESTIMONY CONTINUED: Rob Sunny
 Friday, February 7, 1986
 Page 3

for a system that stretches for miles, from the Tygart, and Cheat Dams to Pittsburgh, Pennsylvania. We must use the existing communications available such as telephone, radio and NOAA. But we will, and must look ahead, to still another system. First it is not economically feasible to incorporate and install a permanent warning system along this far distant route. Even with a system in place, (permanent), there would be gaps where people will not be alerted and if flooding is occurring, Fire Departments are already too busy to alert the whole valley for any sudden surge. Also, roads may already be flooded thus preventing notification to the people in the outlying areas.

Such as the November 5, 1985 flood revealed, we need a back-up and I believe a better method to be incorporated. I am introducing my version called, F.A.S.

FLOOD ALERTING SYSTEM

This can be a 2,000 watt or 4,000 watt - coded sound module, that is already on the market. These can be operated by 110 V or 220 V ac, with even battery back-up power. These powerful sound alerting modules can be stationed, one at the Tygart Dam and another at the Cheat Dam. This amplification coded system can be ready at all times, and when needed can be picked up by a helicopter and raced through the valley. Everyone hears a helicopter chopping and cutting the air at low altitudes and with this special alerting system, it would produce a loud, sufficient alert, utilizing the down beat of the Rotor Blades, pushing the energy sound waves down, and also having a doppler effect, with even more alerting capability. Assuming some people would be asleep, not listening to radio or TV or their electricity off, or phone out of order. These people would definitely hear this type of alert. Roads could be flooded and with this package could save lives and property.

One thing is possible, these units can be in operation NOW. and the sooner the better.

As businesses become larger and larger, they seem to become insensitive to basic common sense and peoples needs and we must quit criticizing our government for the people are the Government and all we are doing is an injustice to ourselves.

TESTIMONY CONTINUED: Bob Sunny
Friday, February 7, 1986
Page 4

I hope this piece of information, will at least, add some input to this an even possible disaster that can happen this very moment.

We recently had an earthquake in our area, who knows what was weakened! Also money seems to be more important to some people: BUT REMEMBER: BEFORE MONEY, WAS MAN!

Thank you,

Bob Sunny

A handwritten signature in cursive script that reads "Bob Sunny".



PENNSYLVANIA EMERGENCY MANAGEMENT AGENCY
P O BOX 3321
HARRISBURG, PENNSYLVANIA 17105-3321



November 26, 1985

Mr. Robert R. Sunny
33 Playford Avenue
Brownsville, PA 15417

Dear Mr. Sunny:

This is in response to your letter of November 12, 1985 addressed to Governor Thornburgh. Your letter was forwarded to this office, the Pennsylvania Emergency Management Agency (PEMA), since PEMA, in conjunction with the Department of Environmental Resources (DER), administers the Commonwealth's Dam Safety Program.

The Cheat Lake Dam (or Lake Lynn Dam) is located in West Virginia and therefore is not under the jurisdiction of DER or its Dam Safety Program. However, a Warning and Evacuation Plan has been developed by the owner and operator of the dam, the West Penn Power Company. This plan, as in most instances, was developed in cooperation with county emergency management agencies located in areas potentially affected in the event of a dam break and/or failure.

The plan provides for surveillance of the dam and outlines procedures for warning public officials should a dam failure or overtopping be imminent. The county emergency management agency is charged with the notification of fire, police, and other departments deemed appropriate. In addition, contact numbers are provided for all officials on a 24-hour basis to insure a rapid emergency response.

Generally, copies of these plans are maintained by the county EMA office or can be obtained from the dam owner.

If you have further questions, do not hesitate to contact this office or the Fayette County Emergency Management Agency at the County Courthouse in Uniontown.

Sincerely,

John L. Patten
Director

JLP/AD/ch

cc: Skip Manclark, Western Area
Director, PEMA

LETTER No 3

00 777



Bulk Power Supply
Cabin Hill, Greensburg, PA 15601 (412) 837-3000

November 10, 1977

Mr. Bob Sunny
33 Playford Avenue
Brownsville, PA 15417

Dear Mr. Sunny:

Mr. Hank Edwardo of the Corps of Engineers related to me that you had requested information relative to the possibility of failure of the dam at Lake Lynn (Cheat Lake). I understand that you are a fireman and have been assigned the task of developing a flood warning system for the City of Brownsville.

The Lake Lynn dam was constructed in the late 1920's and was designed by competent engineers using good practices. It is constructed of concrete. This dam is licensed by the Federal Power Commission and is visually inspected by them each year. A requirement of the Federal Power Commission is that the dam be inspected every five years by independent qualified consulting engineers. Each time an inspection is made, there are recommendations for minor repairs or improvements, but there has never been any serious question about the safety of the dam.

There is a power house associated with the dam and, consequently, we have employees on duty at all times. They, of course, maintain daily observation of conditions at the dam and are constantly performing maintenance work to keep it in good condition. Although we do not expect to ever need to use it, there is a list of persons posted in the control room which includes state and local police, radio and television stations, government officials, etc., who are to be notified immediately in the event of any threat to the safety of the dam.

It is not possible for us to predict the consequences at Brownsville if the dam should fail, but we believe that the likelihood of this happening is so remote that you should not be concerned.

If we can be of any further assistance to you, please let us know.

Yours very truly,

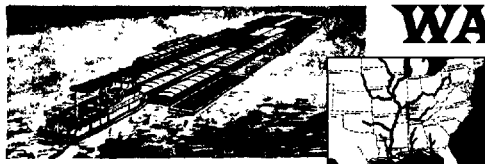
A handwritten signature in dark ink that reads 'R. T. Payne'. The signature is written in a cursive style with a long, sweeping tail on the 'e'.

R. T. Payne

c - Mr. Hank Edwardo - U.S. Corps of Engineers

*the***WATERWAYS
JOURNAL***Weekly*
SINCE 1927

314-241-7354



319 North Fourth St
666 Security Bldg
St Louis, Mo 63102



January 31, 1986

Hon. Robert Roe, Chairman,
House Subcommittee on Water Resources,
2165 Rayburn House Office Building,
Washington, D.C. 20515

Dear Congressman Roe:

This is written in regard to the field hearing you will have February 7 in Point Marion, Pa., in regard to the floods in West Virginia and Pennsylvania.

I was not there and do not live in the area, but I did hear residents discuss the aftermath on Public Television recently and it did not give the Federal Emergency Management Agency a very good name.

In fact, whenever anything is said about FEMA, in time of crisis, including here in Missouri with the Meramec River floods, all you hear about is the red tape, and people being left hanging in the wind, so to speak.

We are having much trouble with the agency because of their refusal to clear up floodplain regulations that are costing our industry a lot of time, trouble and money.

I would hope that the Subcommittee might consider a real oversight hearing on the entire agency and its red tape and uncooperative attitude.

Respectfully,

James V. Swift,
Vice-President



west
virginia
highlands
conservancy

ADMINISTRATIVE OFFICES • Suite 201 • 1206 Virginia Street East • Charleston West Virginia 25301 • (304)344-8833

Publishers of the Highlands Voice

STATEMENT FOR THE RECORD OF THE HEARING OF FEBRUARY 7, 1986
ON THE PROPOSED ROWLESBURG DAM, WEST VIRGINIA

SUBMITTED BY THE WEST VIRGINIA HIGHLANDS CONSERVANCY
AND THE ENVIRONMENTAL POLICY INSTITUTE

SUBCOMMITTEE ON WATER RESOURCES
COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION
UNITED STATES HOUSE OF REPRESENTATIVES

Submitted March 18, 1986

I. Introduction

This statement is submitted jointly by the West Virginia Highlands Conservancy (Conservancy) and the Environmental Policy Institute (EPI) regarding the Rowlesburg Dam and Reservoir which is proposed by the Army Corps of Engineers for construction on the Cheat River in Preston and Tucker Counties, West Virginia.

The Conservancy is a membership conservation organization established in 1967 and is active in the educational, policy and legislative aspects of river conservation, water resources development and other issues of natural resources conservation affecting West Virginia. The Conservancy has been involved in the planning and legislative aspects of the Rowlesburg Dam since the late 1960's.

The Environmental Policy Institute is a professional staff environmental organization based in Washington, D.C. and is a national leader in legislation and administration policy concerning water resources development and management.

II. Historical Position on Rowlesburg Project

Historically, the Conservancy has opposed the construction of the Rowlesburg Project on the basis that the project was uneconomical and socially and environmentally unsound. The Conservancy further objected on the grounds that the Corps of Engineers had failed to adequately investigate both structural and non-structural alternatives for flood control in the Cheat River Basin.

Statement on the Rowlesburg Project - March 18, 1986 - Page 2 of 5
West Virginia Highlands Conservancy - Environmental Policy Institute

This position was adopted by the Conservancy on October 18, 1971 and was based on the Project as proposed at that time. Generally, Rowlesburg has been opposed by the State of West Virginia, local farmers, businessmen and county officials as well as West Virginia conservationists. It was this overwhelming opposition across a broad political spectrum within West Virginia which led the Army Corps of Engineers to place the Project on "inactive status" in 1977.

The Rowlesburg debate predates the creation of EPI which has historically worked for Congressional and administrative policies which require that water resources development projects be economically, socially and environmentally sound.

III. Contemporary Position on Rowlesburg Dam

The Conservancy and EPI do not express a position on the Rowlesburg Project at this time due to the absence of a detailed proposal and lawfully sufficient Draft Environmental Impact Statement as required by the National Environmental Policy Act of 1969, 42 U.S.C. 4321 et seq.

Without such documentation, it is impossible to reach a reasoned judgement regarding any proposal for structural or non-structural flood control alternatives in the Cheat River Basin.

Therefore, the Conservancy and EPI request that the following actions be taken prior to any Congressional consideration of flood control projects in the Cheat River Basin:

- 1) that a programmatic Draft Environmental Impact Statement (DEIS) be prepared for the Cheat River Basin regarding a comprehensive program of structural and non-structural flood control alternatives;
- 2) that the Federal Emergency Management Agency be designated as the "lead agency" and the Soil Conservation Service and Army Corps of Engineers designated as "cooperating agencies" in the preparation of the DEIS;
- 3) that both Congressional and agency field hearings be conducted in West Virginia to permit impacted communities and interests to comment on any flood control proposals; and
- 4) that the express approval of the West Virginia Legislature be obtained in advance regarding any required state appropriations for construction cost sharing or reimbursement for non-federal costs such as recreational facilities.

The Conservancy and EPI recommend that a comprehensive flood control study in the Cheat River Basin should investigate such structural alternatives as:

Statement on the Rowlesburg Project - March 18, 1986 - Page 3 of 5
West Virginia Highlands Conservancy - Environmental Policy Institute

- 1) channel modification adjacent to developed floodplains,
- 2) floodways to enhance channel discharge capacity,
- 3) floodwalls and pumping stations,
- 4) floodproofing of existing structures, and
- 5) small watershed projects.

Non-structural alternatives to be studied should include:

- 1) electronic flood warning systems,
- 2) educational and technical assistance to floodplain residents and businesses,
- 3) financial assistance for relocation and/or floodproofing,
- 4) land-use and floodplain management plans,
- 5) flood insurance, and
- 6) relocation of flood-damaged businesses and residences outside the floodplain.

The Conservancy and EPI recognize that the floods of November 5, 1985 have revealed the very great need for protecting the residents of the Cheat River Basin and downstream communities from tragic floods. Therefore, it is essential that all flood control alternatives be investigated in order to identify those which are environmentally and socially sound and which can be implemented within a reasonable period.

IV. West Virginia Legislature Supports A Comprehensive Study

During the 1986 Regular Session the West Virginia Legislature adopted Senate Concurrent Resolution No. 17 on March 7, 1986 which calls upon the Congress for a comprehensive study of structural and non-structural flood control alternatives.

Whereas, The lack of flood control in existence on the Cheat River caused an exceedingly great loss of life and property and in an effort to prevent future flooding on the Cheat River, a flood control study should be made by the S.C.S. [Soil Conservation Service] for the entire Cheat River Basin including tributaries and utilizing where possible information or expertise of F.E.M.A. [Federal Emergency Management Agency] which might assist in the development of such a program for flood control ...

A proper and adequate flood control study should necessarily investigate and provide for consideration of both structural and non-structural options for flood control; (emphasis added)

Senate Concurrent Resolution No. 17, Journal of the West Virginia Senate, page 66, March 3, 1986

Statement on the Rowlesburg Project - March 18, 1986 - Page 4 of 5
West Virginia Highlands Conservancy - Environmental Policy Institute

V. State of West Virginia Has Opposed Project

The State of West Virginia has formally opposed the Rowlesburg Project since 1977 which action resulted in the Project being placed on "inactive status" by the Corps of Engineers.

We must view this project by what is best suited environmentally and economically for the people of West Virginia. Geologic considerations preclude intense use of almost 80 per cent of West Virginia's land resources base. Therefore, the relative permanency of inundation which preempts future land-use options is significant and demands that each project be evaluated on its own merits. After critical review, the State of West Virginia cannot support any of the proposals for the construction of the Rowlesburg Project....I respectfully request that all planning on the Rowlesburg Project be terminated, and that it be placed on "inactive status."

Governor John D. Rockefeller, Letter of November 9, 1977 to Colonel Max R. Janairo, District Engineer, U.S. Army Corps of Engineers

VI. Specific Concerns Regarding Economic Analysis

Pursuant to the Flood Control Act of 1936, 33 U.S.C. 701a, the Rowlesburg Project must have specific economic benefits which exceed the total construction costs, most recently estimated at \$ 370 million (1977).

However, the substantial modifications to the original Project proposal, made by the Corps of Engineers in the early 1970's, appear to make the Project economically unviable. Specifically:

- 1) the reduction of recreational benefits due to the refusal of the State of West Virginia to enter a cost-sharing agreement for recreational facilities on the grounds that hydropower operations will create mud flats during periodic drawdowns;
- 2) the failure of the Corps to obtain any commitments to purchase the Project's production of hydroelectric power; and
- 3) that the Corps is now prohibited from claiming any economic benefits for water quality improvements by low flow augmentation pursuant to the Federal Water Pollution Control Act, 33 U.S.C. 446.

The economic benefits assigned to recreation, hydropower and water quality enhancement account for over 88.0 percent of Project benefits. Flood control benefits represent less than 12.0 percent of the economic justification for the Project.

Statement on the Rowlesburg Project - March 18, 1986 - Page 5 of 5
West Virginia Highlands Conservancy - Environmental Policy Institute


Under these circumstances, it appears that the cost/benefit ratio of 1.7 projected by the Corps of Engineers in 1970 and the supporting economic analysis is unrealistic and should be revised on the basis of only those flood control, power and recreational benefits which can be assured in advance of construction.

VII. Conclusion

The West Virginia Highlands Conservancy and the Environmental Policy Institute requests that the Subcommittee on Water Resources subject any authorization for the Rowlesburg Project to a thorough review. Further, we ask that the Subcommittee and Chairman Roe request the House conferees on the Omnibus Rivers and Harbors Act of 1986 to seek a study authorization for the Cheat River Basin consistent with the above recommendations.

Respectfully submitted,

WEST VIRGINIA HIGHLANDS CONSERVANCY, INC.,
and the
ENVIRONMENTAL POLICY INSTITUTE, by



Larry W. George, President
West Virginia Highlands Conservancy

BUSINESS AFFILIATION
 PRESIDENT
 ALLEGHENY DEVELOPMENT CORP
 ALLEGHENY REAL ESTATE SALES, INC
 VICE PRESIDENT
 PINEVIEW REALTY, INC
 PINEVIEW SUPPLY CORP

Richard Yoder

1225 PINEVIEW DR.
 MORGANTOWN, WV 26505

TRADE ASSOCIATION & GOVERNMENT
 PRESIDENT 1973-74
 N. GEN. WV HOME BUILDERS ASSOC
 PRESIDENT 1976-77
 HOME BUILDERS ASSOC. OF WV
 CHAIRMAN 1978-79
 WV INTERAGENCY HOUSING COUNCIL
 SUBCOMMITTEE MEMBER - #73
 CON. ON GOV. AND FINANCE - WV LEGISLATURE
 BOARD MEMBER 1980
 WV HOUSING DEVELOPMENT FUND
 BOARD CHAIRMAN 1984
 WEST RUN WATER SHED IMPROVEMENT DISTRICT

February 7, 1986

The Honorable Harley O. Staggers
 The Honorable Robert E. Wise
 The Honorable Austin J. Murphy
 The Sub-Committee of Water Resources
 and other Public Officials: interested
 in the Cheat and Monongahela Rivers
 Flood Control

RE: Hearings scheduled at Point Marion,
 Pennsylvania, February 7, 1986

Gentlemen:

As a private citizen and as a representative of certain collective interests, I would like to present to you the following information or testimony for your consideration.

In the interest of conservation, preservation, and the development of our natural resources it is imperative that our public officials, whether it be at the federal, state or local level, proceed and take action and address the ever ongoing problem of the Cheat and Monongahela Rivers basins. Of course, this must also be expanded to all of their drainage tributaries respectively. The issue, as I perceive it, is too extensive for either Pennsylvania or West Virginia to address independently. These rivers were created with the environment long before either the state of Pennsylvania or the state of West Virginia were created. Therefore, we must conclude that the issue must be addressed initially on the Federal level.

For the record, I was born and raised in the state of Pennsylvania. However, for many years I've been a resident of West Virginia and have recently personally seen some of the serious devastation which resulted from the 1985 flood which occurred. I've since been to Moorefield, Albright, Cheat Lake and other areas which were seriously damaged by the flood. As recently as yesterday, I was present at the Monongahela Soil Conservation District office where a slide show was presented dealing with the flood damage which occurred in the various counties of West Virginia. I am a real estate property owner in Pennsylvania, but not in Fayette county. I am also a real estate owner, developer and builder in West Virginia primarily in Monongalia county. It should also be noted that I have real estate interests in Preston and Clay counties.

I wholeheartedly support a large flood control project for the Cheat River basin in West Virginia and in addition I also support the concept of building smaller lakes and dams which would serve as collectors at the various tributaries which flow into the Cheat River, as well as, the Monongahela River. In Preston county I am personally aware of a situation where a beautiful lake could be constructed on a tributary which flows from West Virginia to Pennsylvania and then again to West Virginia which would help in a small way as a flow control and at the same time provide a good economic base for recreation and development. I am also Chairman of the Board of Trustees

January 7, 1986
Page Two
Hearings

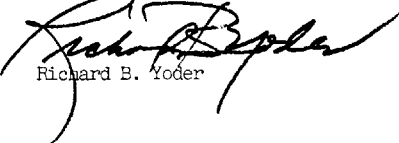
of the West Run Watershed Improvement District which covers approximately 6,000 acres and is situated in Monongalia County and a portion of which is also in the corporate city limits of Morgantown.

The Burroughs Run Tributary which frequently floods constantly causes damage to homes and businesses in that particular area. For the record, this is simply pointed out so that there may be a clear understanding that the West Virginia people, as well as, the Pennsylvania people on the Monongahela River and McKeesport also need the assistance of the U.S. Congress.

On a similiar note, I have observed that there is presently considerable debris, sediment, and garbage lodged in the Cheat Lake proper which 48 crosses the lake and unless some immediate steps are taken to remove this sediment or garbage the lake will lose its primary function as a clean recreational facility and as a flood control element. Within the past week I have had reports from a former and now retired engineer of the West Virginia Health Department that Cheat Lake in recent years, was fairly clean which was verified by the monitoring and testing for a period of one year. I would hope that this lake could again be restored to its beauty as it was twenty years ago or the time I was a student at West Virginia University.

I thank you for being able to present this information to you and trust you will immediately take steps to provide the necessary dollars for study, engineering, and the final resolve of the ever ongoing problem faced by our people in both Pennsylvania and West Virginia as it relates to the preventative measures which you can afford for the sake of our land, the natural resources in the name of conservation, preservation, and future economic development of the area. Should you desire any further information or if I can be of any assistance, please do not hesitate to call me at 599-0829.

Yours very truly,



Richard B. Yoder

RBV/amm

○