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# FORMING A COMPREHENSIVE APPROACH TO MEETING THE WATER RESOURCES NEEDS OF COASTAL LOUISIANA IN THE WAKE OF HURRICANES KATRINA AND RITA

## HEARING

BEFORE THE

## COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

ONE HUNDRED NINTH CONGRESS

FIRST SESSION

NOVEMBER 9, 2005

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# FORMING A COMPREHENSIVE APPROACH TO MEETING THE WATER RESOURCES NEEDS OF COASTAL LOUISIANA IN THE WAKE OF HURRICANES KATRINA AND RITA

**WEDNESDAY, NOVEMBER 9, 2005**

U.S. SENATE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
*Washington, DC.*

The committee met, pursuant to notice, at 9:30 a.m. in room 406, Senate Dirksen Building, Hon. James Inhofe (chairman of the committee) presiding.

Present: Senators Inhofe, Thune, Isakson, Vitter, Jeffords, Carper, Clinton.

## OPENING STATEMENT OF HON. JAMES M. INHOFE, U.S. SENATOR FROM THE STATE OF OKLAHOMA

Senator INHOFE. We will ask the hearing to come to order. It happens today that I have an amendment on the floor, and Senator Vitter has been good enough to say that he would chair this meeting.

I would ask unanimous consent that my statement be made a part of the record. Without objection, so ordered.

[The prepared statement of Senator Inhofe follows:]

STATEMENT OF HON. JAMES M. INHOFE, U.S. SENATOR FROM THE STATE OF OKLAHOMA

Good morning and welcome to our third full committee hearing in response to Hurricane Katrina. Our first two hearings focused on initial Federal Agency responses to the storm, while this one will look at the future—specifically near-term, intermediate and long-term steps by the Army Corps of Engineers needed to facilitate the rebuilding of coastal Louisiana.

I want to thank all of our witnesses for coming today. I know some of you have been here before, and I appreciate your willingness to speak with us again. We also have a couple newer faces on this issue, and I look forward to hearing ideas from a fresh perspective.

As everyone here knows, the Senate Environment & Public Works Committee has sole jurisdiction over the Civil Works mission of the Army Corps of Engineers and will be the focal point for the development of any legislation necessary to direct the corps' activities, as well as for providing oversight of these activities. As chairman of this committee, I take that responsibility very seriously, and I am pleased we have heard from so many willing to help us fulfill our mission.

The committee held a stakeholders meeting on October 20th for staff to hear from a broad range of interested parties, local and national, as to what needs to be done to ensure the recovery of the region.

One of the common themes to emerge was the importance of taking a comprehensive and integrated approach to the three main missions of the Army Corps in coastal Louisiana, which are flood and storm damage reduction, navigation and wetlands

restoration. Today we will further explore this idea to find out how such an approach might be structured and how we can ensure its effectiveness.

By anyone's measure, the Federal investment to be made in rebuilding and protecting the city of New Orleans and the surrounding coastal area will be substantial. It is vital that this investment be made in the context of a well-thought-out plan and with maximum coordination with State and local planning decisions.

Another common theme from the stakeholders meeting is that it is the people who live there, not the Federal Government, who should be deciding where and how to rebuild the area. As a former mayor myself, I agree that it is unacceptable to have the Federal Government making local planning decisions, but I am afraid it could happen by default if we don't receive a clear message from the local communities as we move forward with Federal activities to provide storm protection.

We also have to ensure that there is proper oversight and cost controls on these Federal activities—we cannot afford to do this wrong or for it to be a free spending boondoggle. I look forward to hearing from the witnesses their ideas on what safeguards might be appropriate and most effective.

I do want to add that before we get too far down the road of deciding what we should do when rebuilding, we must first know what happened to the levees and why the city was flooded. There are a number of experts taking a look at this very issue and we will remain in close contact with those investigations. When we have facts and the time is appropriate, the committee will hold a hearing on the findings and take whatever steps are necessary.

While it is too early for final conclusions, I understand that the corps has been making some adjustments when restoring the current protection to take into account initial findings. I hope to hear more details from General Riley and Mr. Dunlop.

Once again, thank you all for coming today. I look forward to hearing your testimony and to discussing some topics more in-depth during questions.

Senator INHOFE. One thing I would like to ask at the appropriate time, and perhaps you can do it for me, there has been some confusion, and we have a witness from the GAO. I had felt, after researching after the tragedy of Katrina took place that in 1977 there was an effort by the Corps of Engineers to do something recognizing that it wasn't a matter of if but when we would have a more devastating type of a hurricane. They were talking about enhancing the levee at that time.

That was enjoined by an environmental group that, my feeling was after studying it, if they had not done that, they would have corrected that situation and we would not have had the devastation that Katrina produced for us.

There was a GAO report that came out that said no, that was not the case. I understand that Ms. Mittal, you are going to clarify that. So I would like to ask, since I won't be here, Mr. Chairman, that you be sure that you pursue that for me, if you would do that.

Senator VITTER. Absolutely.

Senator INHOFE. I thank you very much, sir.

Senator VITTER. [Presiding] Thank you, Mr. Chairman, and thank you for calling this hearing and this meeting to order. I don't know if you had any other opening comments.

Senator INHOFE. No, for the record is fine. Oh, I do have one more thing here. I want to introduce somebody in the audience, John Berry. Stand up John. John is chief of the Quapaws.

While we are not dealing with Superfund in this particular hearing, the most devastating Superfund site in America is located in northern Oklahoma, called Tar Creek. We have something where we think that, in helping our situation, we can also help the recovery and the rebuilding of the levee that you and I and Chief Berry will be meeting on later on today. So welcome to our hearing, Mr. Chairman.

## OPENING STATEMENT OF HON. DAVID VITTER, U.S. SENATOR FROM THE STATE OF LOUISIANA

Senator VITTER. Welcome, Mr. Chairman, and thank you for that—the other Mr. Chairman.

I have a brief opening statement. Again, I want to thank the chairman of the committee for calling this hearing today. It is a vital step in understanding the unique situation in south Louisiana and the vital need, the vital national need to design a new, innovative and effective program to move forward.

I want to thank all of our witnesses for agreeing to testify before the committee, especially Windell Curole, who traveled from Louisiana to be with us today. I also particularly look forward to discussing the protection plans with the corps representatives here today, George Dunlop and Major General Riley from the Army Corps of Engineers.

The important point here is that the old system did not work and we need to move forward under a dramatically new and improved structure.

Over the past few months the devastation from Hurricanes Katrina and Rita has brought attention to how reliant our Nation is on south Louisiana's ports, our energy resources, our seafood and trade. Americans have felt the economic impact of the storms through increased prices at the gas pump, higher payments for their electric and heating bills, disruption to commerce, particularly trade and seafood. Of course, Louisianans have felt the impact both economically and emotionally, and they have lost their homes, their jobs, their communities in some cases.

Those are only some of the reasons why it is important that we rebuild Louisiana quickly, not only so Louisianans can get their lives together and return home, but so Americans across the United States can feel relief in energy costs and so commerce can continue to flow and all of those vital services to the Nation can continue.

Louisianans want to come back home and our businesses want to rebuild. But more than anything else, they need reassurance that their homes and businesses will not wash away come the next storm. A comprehensive and integrated approach is necessary to rebuild and meet the water resources needs of coastal Louisiana.

That integrated approach includes strong hurricane protection, much stronger than what we had before, strong flood prevention, ecosystem restoration and efforts to meet vital navigation needs. We must make sure this tragedy we have all experienced and lived through and observed never happens again.

And there is really no reasonable time line to do that. We need the levees rebuilt now, we need stronger hurricane protection now. Rebuilding to pre-Katrina conditions is not an option, since that was clearly inadequate. By June 2006, the start of the next hurricane season, we need a stronger level of protection than was there right before Katrina. Of course, better design and better technology must be incorporated into those efforts.

We cannot rebuild the same as before and expect different results. This time around we need better, stronger hurricane protection. Our protections need improvement with the use of better design and technology. Of course, coastal restoration efforts must be

fully integrated with these protection efforts, because coastal land is the first defense against hurricanes and is an important part of the overall picture.

Two months before Hurricane Katrina hit Louisiana, I sat before the Commerce Committee hurricane preparedness hearing and said that we could spend millions now preventing hurricane damage to south Louisiana or we could spend billions later responding to a major hurricane disaster. Unfortunately, those words came true just 2 months later.

We can't make this mistake again. Congress has already responded to Hurricane Katrina by providing almost $70 billion in emergency relief. About 1,000 of my constituents have lost their lives. Had we an expedited corps process and just a fraction of these funds, we could have virtually eliminated the need for that loss.

Just as the traditional corps project and appropriation process was inadequate before the storm, it is clearly inadequate now after the storm. We need to rebuild, so people are safe from future hurricanes. We need hurricane protection levees that will sustain a category 5 hit. The only appropriate response to these needs has to include programmatic authority to implement strong hurricane protection and flood prevention in an expedited manner.

In closing, I want to re-emphasize that we have already appropriated or provided tax incentives totaling twice the cost of even the most generous estimates for armoring all of south Louisiana and fully restoring our coast. Our delegation has been fighting for this proactive effort for years. Now that over 1,000 lives have been lost, we have to do this. We have to do it right and quickly so that we don't suffer those losses again.

I look forward to working with this committee, working with all of our witnesses and many others on advancing a new, comprehensive, integrated, system-wide, streamlined, expedited program to do all of this. Thank you very much.

[The prepared statement of Senator Vitter follows:]

STATEMENT OF HON. DAVID VITTER, U.S. SENATOR FROM THE STATE OF LOUISIANA

Mr. Chairman, thank you for holding this very important hearing. Today's hearing is a vital step in understanding the unique situation in south Louisiana and designing a new, innovative and effective program to move forward.

I would like to thank all of the witnesses for agreeing to testify before the committee, especially Windell Curole who traveled from Louisiana to be with us today. I also look forward to discussing protection plans with the corps here today—George Dunlop and Major General Riley from the Army Corps of Engineers. The important point here is that the old system did not work and we should not be moving forward under the same structure.

Over the past few months, the devastation from Hurricanes Katrina and Rita has brought attention to how reliant our nation is on South Louisiana's ports, energy resources, seafood, and trade. Americans have felt the economic impact through increased prices at the gas pump, higher payments for their electric and heating bills. Louisianans have felt the impact both economically and emotionally—they have lost their homes, their jobs, their communities.

Those are only some of the reasons why it is important that we rebuild Louisiana quickly—not only so Louisianans get their lives back together and return home, but also so Americans across the United States can feel relief in energy costs.

Louisianans want to come back home and our businesses want to rebuild but they need reassurance that their home will not wash away come the next storm. A comprehensive and integrated approach is necessary to rebuild and meet the water re-

sources needs of coastal Louisiana. Integrated approach should include strong hurricane protection, flood prevention, ecosystem restoration and navigation.

We must make sure this never happens again. There is no reasonable timeline. We need the levees rebuilt now. We need stronger hurricane protection now. Rebuilding to "pre-Katrina conditions" is not an option. By June 2006—the start of the next hurricane season—we need a stronger level of protection. It is the only option. Better design and better technology must be incorporated into our ongoing efforts.

We can not rebuild the same as before and expect different results. This time around we need better, stronger hurricane protection. Our hurricane protections need improvement with the use of better designs and technology. Coastal restoration efforts should be fully integrated with these protection efforts.

Two months before Hurricane Katrina hit Louisiana, I sat before a Commerce Committee hurricane preparedness hearing and said that we could spend millions now preventing hurricane damage to south Louisiana or we could spend billions later responding to a major hurricane. Unfortunately, we have chosen the later. We must not make this mistake again. Congress has already responded to Hurricane Katrina by providing over $60 billion in emergency relief and approximately 1,000 of my constituents have lost their lives. Had we had an expedited corps process and just a fraction of these funds, we could have virtually eliminated the need for this emergency relief spending.

Just as the traditional corps project and appropriation process was inadequate before the storm, it is inadequate after the storm. We need to rebuild Louisiana so people are safe from future hurricanes. We need hurricane protection and levees that will sustain a category 5 hurricane. The only appropriate response to the protection of south Louisiana must include programmatic authority to implement strong hurricane protection and flood prevention in an expedited manner.

In closing, I would like to reemphasize that we have already appropriated or provided tax incentives totaling twice the cost of fully armoring all of south Louisiana and fully restoring our coast. Our delegation had been fighting for this pro-active effort for years. Now that 1,000 lives have been lost and we have spent billions and billions of dollars—and will spend much more—let us act quickly and wisely in insuring we protect our citizens with a new process, a new program and a bright, new future for south Louisiana.

I look forward to working with the committee and hearing from all of the witnesses on advancing a new, comprehensive, integrated, system-wide, streamlined and expedited program to address the hurricane, flood and coastal protection and navigation program for south Louisiana.

Senator VITTER. Now I will ask Senator Jeffords, our Ranking Member, if he has opening comments.

## OPENING STATEMENT OF HON. JAMES M. JEFFORDS, U.S. SENATOR FROM THE STATE OF VERMONT

Senator JEFFORDS. Yes, I do. I want to thank you for holding today's hearing on water resource needs in the wake of Hurricane Katrina. In the eyes of many, taking action on water resource issues is really the first step in the recovery of southern Louisiana. Without adequate flood control, redevelopment will be impossible.

Today's hearing is a follow-up from the stakeholders' meeting we held several weeks ago, at which time more than 30 people came before our committee to provide their views on the next steps. Today we are hearing from a smaller group. But our work has already been influenced by that larger gathering. I know some of our witnesses today were at the previous meeting and I want them to know I value their insights.

Today we are essentially covering two main questions: why do we need investment in water resources and what do we need to do. I look forward to hearing from our witnesses on those points.

At the stakeholders meeting we heard several major themes that I see are echoed in today's written testimony. We have heard the personal stories of how Katrina impacted the lives of so many peo-

ple. We have heard about the special, unique features this area of the Country brings to us.

For me, this is why, this is the why of investment in our water resources. I will never tire of hearing these stories, and I encourage our witnesses to share your experiences with us.

We have heard that the water resource investment must be comprehensive and include flood control, ecosystem restoration, and navigation. Piecemeal solutions will not solve the problem.

We have heard the message loud and clear that time is of the essence. People in Louisiana are frustrated with the lack of progress in developing a WRDA proposal and enacting that critical reauthorization bill. We need to move quickly but balance the need for speed with the need for safety. We should not rebuild an entire levee system without incorporating the lessons learned from the failure of that system.

I am a little dismayed that there is an $8 million study included in the Energy and Water Conference Report that covers only flood control. This seems to be a narrow evaluation that will take a long time, rather than a comprehensive study that will be finished quickly. It seems to be the exact opposite of what we have been hearing that we need.

We have also heard that local redevelopment plans must guide future spending decisions. We may or may not need category 5 flood protection everywhere. The Mayor of New Orleans testified before our committee last week that he has a group working on this, as does the Governor. I would like to hear from each of the witnesses as to how you think this process is going.

To give some additional perspective to today's hearing, I want to emphasize as I have in our last several Katrina events a little bit of the history about disaster response. Over the past 200 years, our Nation has moved from an ad hoc approach to a coordinated, orderly approach with the help of the Stafford Act.

In the aftermath of Hurricane Katrina, I believe we witnessed the degradation of our Nation's response system as a result of a bad decision to move FEMA into the Department of Homeland Security. There, FEMA became lost in endless bureaucracy, and we have seen the tragic consequences. I have joined Senator Clinton in an effort to correct that mistake.

Mr. Chairman, since my good friend, Senator Bob Stafford of Vermont, for whom the Stafford Act was named, was a member of this committee, we have traditionally been the go-to committee for emergency response. We have an opportunity here with the Army Corps of Engineers to continue in that tradition and take meaningful action to change the way we do business and help Louisiana recover.

I stand ready to help and to make that happen. Thank you, Mr. Chairman.

[The prepared statement of Senator Jeffords follows:]

STATEMENT OF JAMES M. JEFFORDS, U.S. SENATOR FROM THE STATE OF VERMONT

Good morning. Mr. Chairman, I want to thank you for holding today's hearing on water resource needs in the wake of Hurricane Katrina.

In the eyes of many, taking action on water resource issues is really the first step in the recovery of southern Louisiana. Without adequate flood control, redevelopment will be impossible.

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Today we are essentially covering two main questions: Why do we need investment in water resources, and what do we need to do? I look forward to hearing from our witnesses on those points.

At the stakeholders meeting, we heard several major themes that I see are echoed in the written testimony for today. We have heard the personal stories of how Katrina impacted the lives of so many people, and we have heard about the special, unique features this area of the country brings to us. For me, this is the "why" of investment in water resources. I will never tire of hearing these stories, and I encourage our witnesses to share your experiences with us. I want us all to remember that it is the people of this region we are talking about at this hearing.

We have heard that water resource investment must be comprehensive, and include flood control, ecosystem restoration, and navigation. Piecemeal solutions will not solve the problem. We have heard the message loud and clear that time is of the essence. People in Louisiana are frustrated at the lack of progress in developing a WRDA proposal and enacting that critical reauthorization bill. We need to move quickly, but balance the need for speed with the need for safety. We should not rebuild an entire levee system without incorporating the lessons learned from the failure of that system.

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Mr. Chairman, I am disappointed that I even need to raise this next point, but I know that there is interest in this. The claims that environmental litigation is somehow responsible for flooding in New Orleans are false, and distract us from what I believe is our real purpose here: to use water resource investments as a positive tool in the rebuilding of the New Orleans area.

To give some additional perspective to today's hearing, I also want to emphasize, as I have at our last several Katrina events, a bit of history about disaster response. Over the last 200 years, our Nation has moved from an ad hoc approach to a coordinated, orderly approach, with the help of the Stafford Act. In the aftermath of Hurricane Katrina, I believe we witnessed the degradation of our national response system as a result of the bad decision to move FEMA into the Department of Homeland Security. Once there, FEMA became lost in an endless bureaucracy and we have seen the tragic consequences. I have joined Senator Clinton in an effort to correct that mistake.

Mr. Chairman, since my good friend Senator Bob Stafford of Vermont, for whom the Stafford Act was named, was a member of this committee, we have traditionally been the "go to" committee for emergency response. We have an opportunity here with the Corps of Engineers to continue in that tradition, and take meaningful action to change the way we do business and help Louisiana recover. I stand ready to help make that happen.

Senator VITTER. Thank you very much, Senator. Now we will go to our first panel. We have Mr. George Dunlop, Principal Deputy Assistant Secretary for Civil Works at the U.S. Army; we have Major General Don Riley, Director of Civil Works with the U.S. Army Corps of Engineers; and Ms. Anu Mittal, Director of the Natural Resources and Environment Section of the U.S. General Accountability Office.

Thank you all very much for your work, first and foremost, but also for being here and testifying.

Mr. Dunlop.

**STATEMENT OF GEORGE DUNLOP, PRINCIPAL DEPUTY ASSISTANT SECRETARY, CIVIL WORKS, U.S. ARMY**

Mr. DUNLOP. Thank you very much, Mr. Chairman and Senator Jeffords. We greatly appreciate the opportunity to come and share our thinking with you today. I am pleased to discuss the role of the Department of the Army and General Riley will discuss the role of the Corps of Engineers and the recovery and rebuilding efforts that lie ahead in the Gulf Coast area.

Our respective prepared testimonies go into detail as to the tasks now underway and how they provide a comprehensive and integrated approach that you both have addressed to meeting the challenges of the Gulf Coast hurricanes. I trust that our prepared testimonies can be entered into the record.

Senator VITTER. Without objection, that will happen.

Mr. DUNLOP. Thank you, sir.

General Riley will summarize the various initiatives in which the Administration and the corps are now engaged, and if you will permit me, I would like to take my time to emphasize seven policy issues and objectives that we believe are important to guide this work.

First, we believe that careful attention must be given to how we can best integrate and coordinate future flood and storm damage reduction objectives with one another and with the needs of the coastal wetlands ecosystem. Second, we emphasize the importance of working with State and local officials as they plan for the future of New Orleans, for the parishes in southern Louisiana and Mississippi and other parts of the Gulf Coast.

Third, the President has established by Executive Order the cabinet level White House Gulf Coast Recovery and Rebuilding Council to further strengthen Federal support for the recovery and rebuilding efforts through an effective, integrated, fiscally responsible coordination effort through this, what we trust will be an effective, integrated and fiscally responsible coordination from all the relevant Federal agencies working together. Also with the State, local, tribal Governments, the private sector, faith-based and other community and humanitarian relief organizations.

Fourth, we believe that a comprehensive, definitive, forensic analysis is essential. Already, an independent team of the American Society of Civil Engineers is collecting information to apply to the development of the design criteria for storm protection and other features that are necessary.

Other organizations and individuals are doing important work in this regard. Perhaps you have read or are familiar with the study from LSU, the National Science Foundation. It is our policy that to the extent practicable, all relevant information is to be carefully considered and objectively assessed.

To assure this, the Secretary of Defense has directed the Secretary of the Army to convene a panel of experts under the auspices of the National Academies of Sciences to evaluate the information collected by the corps and all these other parties, so as to provide an independent, peer-reviewed assessment of the performance of the storm damage reduction system in place in New Orleans and the surrounding areas.

The National Academies will report directly to the Assistant Secretary of the Army for Civil Works, Mr. Woodley. This definitive study is expected to take approximately 8 months to complete.

Fifth, following this forensic analysis, all of us will need to evaluate the broad range of options before we develop recommendations as to the best ways to reduce the risks in the future, for future storm damages for the city of New Orleans and the surrounding parishes. Senator Jeffords mentioned the $8 million that was provided for in the conference report that would fund an already authorized feasibility study to undertake that kind of analysis.

Sixth, to emphasize the importance of the coastal wetlands ecosystem, last week the Administration requested a reallocation of $250 million of the emergency supplemental appropriations to provide funds for the Secretary of the Army to undertake immediate construction activities related to the restoration of the natural coastal features that will help reduce the risk of storm damage in the greater New Orleans area.

Seventh, the Administration is working with Congress and with the State of Louisiana to develop a generic authorization for the near-term Louisiana coastal ecosystem protection and restoration program. This generic programmatic approach will expedite the approval process for projects and their implementation.

I think that picking up on some of the terms that I heard you address in your remarks, streamlining, quickly, and to avoid piecemeal activity, this programmatic approach will provide greater flexibility in setting future priorities and increased opportunities for the application of adaptive management decisionmaking.

Such an integrated, programmatic approach to the coastal wetlands protection and restoration will be innovative and it is essential for program efficiency and efficacy.

Mr. Chairman, this concludes my summary statement. I look forward to working with you, and Secretary Woodley does, and the ranking member of the committee and other committee members on matters of mutual interest and concern. Following Major General Riley's statement, I would be pleased to respond to any questions you may have.

Senator VITTER. Thank you.

General Riley.

## STATEMENT OF MAJOR GENERAL DON T. RILEY, DIRECTOR OF CIVIL WORKS, U.S. ARMY CORPS OF ENGINEERS

General RILEY. Thank you, Mr. Chairman and Senator Jeffords.

As the Director of Civil Works, I am honored to be here today to testify with Mr. George Dunlop on our participation in the Federal recovery and rebuilding efforts.

As you know, the corps is continuing today with our contractors to execute the FEMA missions of debris removal and temporary roofing in the impacted area. Additionally, we are working around the clock on the repair of levees and flood walls to reduce the risk of damage through the remainder of this hurricane season as well as the rainy season this winter. Our goal is to repair the levee system to the authorized design level prior to the start of the next hurricane season in June.

We are also actively gathering data and employing lessons from the recent storms and have begun an assessment of the existing storm damage reduction system. Furthermore, the Chief of Engineers has commissioned an interagency performance evaluation task force to conduct the engineering evaluation. This team includes engineers and scientists from our engineering research and development center, as well as other Federal agencies such as the Bureau of Reclamation and NOAA.

The American Society of Civil Engineers is also supporting our efforts with an external review panel and will provide an independent oversight of the evaluation.

Before the final team report is released in June of next year, all important findings are being shared with those who are involved in the design, engineering and repair of existing New Orleans levees and floodwalls. Further, we are making all of our findings available to the public and invite the public and the scientific and engineering community to share any information they may have.

As Mr. Dunlop referred to the process of evaluating the flood and storm damage reduction system in the New Orleans area, we are deliberately integrating the important role of coastal wetlands. The proposed near term aquatic ecosystem restoration plans for the Louisiana coastal area would prevent some of the ongoing wetland losses, create new marshlands and nourish existing marshes.

To close, the corps stands ready to work in close partnership with the States of Louisiana, Mississippi, the city of New Orleans and other Gulf Coast cities to assist them in an integrated, holistic approach to plan for their future. Again, I appreciate the opportunity to testify and I will be happy to answer any questions.

Senator VITTER. Thank you, General.

Ms. Mittal.

**STATEMENT OF ANU MITTAL, DIRECTOR, NATURAL RESOURCES AND ENVIRONMENT, U.S. GENERAL ACCOUNTABILITY OFFICE**

Ms. MITTAL. Mr. Chairman and members of the committee, my testimony today will cover the history, status and funding of the Army Corps of Engineers Lake Pontchartrain hurricane protection project. Hopefully my statement will clarify some of the confusion that Senator Inhofe referred to earlier.

The beginnings of the Lake Pontchartrain project go all the way back to the early 1960's. At that time, the corps was considering two different hurricane protection designs that were expected to protect New Orleans from flooding caused by a standard project hurricane, which is roughly equal to a fast-moving category 3 hurricane.

The first design considered was known as the Barrier Plan, and included a series of levees and floodwalls combined with a set of barriers and flood control gates to prevent storm surges from entering Lake Pontchartrain. The second was known as the high level plan, and did not include the barriers and flood control gates, but instead relied on higher levees to protect the city.

In the 1960's, the corps favored the Barrier Plan, because for the same level of protection, it was less expensive and quicker to construct. At that time, it was estimated that the Barrier Plan would

cost about $85 million and would be completed by 1978. The project was authorized by Congress in 1965 as a joint Federal, State and local project, with the corps having responsibility for project design and construction and local sponsors having responsibility for operations and maintenance. The Federal share of project costs was set at 70 percent, and the State and local share was set at 30 percent.

The corps started building the Barrier Plan in 1967, but almost immediately ran into a variety of challenges that caused the project to undergo significant design changes, caused delays in construction and also increased project costs. Specifically, lessons learned from Hurricane Betsy in 1965 and foundation problems encountered during construction resulted in design changes to the levees and the flood walls.

In addition, parts of the project faced significant opposition from local sponsors, and they did not provide the rights of way that the corps needed to build the levees on schedule.

Finally, there were serious concerns relating to the environmental impacts of the control barriers that were to be constructed at the tidal passes to the lake. This ultimately resulted in a legal challenge, and in 1977, the courts enjoined the corps from constructing the barrier complexes until a revised environmental impact statement could be prepared.

After the court decision, in the mid–1980's, for several reasons the corps decided to change course and abandoned the Barrier Plan and shifted instead to constructing the High Level Plan. Since that time, the corps has been working to complete these higher levees and floodwalls. The total cost of the project had grown to $738 million and its completion date had slipped to 2015, which is nearly 50 years after it was first authorized. Before the Katrina damage occurred, the corps estimated that the project was about 60 to 90 percent complete.

With regard to funding provided for the project, over the last 10 fiscal years, Federal appropriations have totaled over $128 million. Also through reprogramming actions, the corps has made an additional $13 million available for the project. Nonetheless, according to the corps, the budget request for fiscal years 2005 and 2006 and the appropriated amount for fiscal years 2005 were insufficient to fund new construction contracts.

In recent years, questions have also been raised about the ability for the project to withstand hurricanes larger than what it was designed for. In 2002, the corps completed a pre-feasibility study and was making plans to conduct a full feasibility study, which it estimated would take several years and cost over $8 million.

In conclusion, Mr. Chairman, the corps faces a daunting challenge to effectively rebuild the hurricane protection system for New Orleans to pre-Katrina levels by June 2006, which as you know is when the next hurricane season will begin. This is especially true now that we know from the preliminary reports of the investigative teams who are studying the levee breaches that a number of mechanisms, and not just scouring caused by overtopping the flood walls, actually contributed to system failure in various places.

As the corps moves forward with its efforts, it will have to consider this new evidence and will have to devise effective solutions

that will allow it to appropriately rebuild the hurricane protection system for New Orleans.

That concludes my prepared statement. I would be happy to answer any questions.

Senator VITTER. Thank you very much, Ms. Mittal.

Now we will get to questions in the order that Senators have arrived for the hearing. I will start first. This is really for either Mr. Dunlop or General Riley.

I am very, very concerned that we are in the process of slipping back to the same old ways and the same old schedules, even after this major disaster. I hope we all share the goal of avoiding that, because that's simply not good enough. An example of that concern is the forensic analysis and other study about what caused the levee breaches after Katrina.

As I understand your testimony, Mr. Dunlop, that analysis will be completed in 8 months. That's about exactly the same period of time that the work to fix the levees and correct for those design and/or construction flaws must be completed.

Does that strike you as not making a whole lot of sense, to have a time table to figure out what went wrong that ends at the same time as all the work to fix it must end?

Mr. DUNLOP. Thank you, Senator, that is an excellent point. But in fact, I think that it is not inconsistent. The nature of the forensic study and the way that I explained about how it is going to be peer reviewed for the National Academies of Science, including the Academy of Engineering and all these other people, in 8 months there will be a definitive, comprehensive, reliable analysis available for the public, for Congress and others to consider.

In the interim, while that study is ongoing, there are all kinds of people who are collecting information. I addressed some of those in my remarks, particularly as General Riley has gone into some detail about the interagency performance review team. That work is underway right now as we speak.

As they work at this, if I can use the acronym IPET, the team that the corps has assembled with the interagency people, the work for the American Society of Civil Engineers that is contributing to that data collection, as that work is going on collecting this information, and that is, as we speak now, the teams are being put together by the National Academies of Science to assess these things, all that information is being able to be used by the people who are engineering this work, who are out there now with construction equipment mobilizing people and resources to do the tasks.

So the concept of the forensic study, I emphasize the word definitive in my remarks because I think that we owe the Congress and we owe the American people a report that will be comprehensive and definitive. In the meantime, we will undertake the interim information, and we have provided for in our contract with the National Academies of Science that there will be regular reports as they are assessing information and data that would be used by the engineers and the people that the Corps of Engineers contracts with to do the work.

General Riley, could you address some of the particular and specific activities that are now underway that Senator——

Senator VITTER. If I could, the time is limited, so if I could just follow up on that. I guess I just respectfully disagree. If the work has to be done by next June, and I think that in itself should be pushed up in some ways, if the work has to be done by next June, I think we should have the definitive findings well before that. I don't understand why that's not possible.

But in any case, since this development of understanding is ongoing, as we sit here today, what is your and the General's understanding of what caused the breaches at the 17th Street Canal, at London Avenue and at the Industrial Canal?

Mr. DUNLOP. General, I will let you respond to that, but do let me say that if we could share with you the details of the commission to the IPET, you will see that the comprehensive nature of that data collection could not reasonably be done in a definitive way before this 8-month period.

Nevertheless, General, would you address the point?

General RILEY. Yes, Mr. Chairman, if I could. My understanding, and what I observed out there on the ground of the Inner Harbor Canal was clearly an overtopping. The surge there was a great surge. There are questions now where that surge came from, whether directly from Lake Borgne, how much the Mississippi River Gulf Outlet contributed to that, and how much was contributed from Lake Pontchartrain.

So that's what the study will definitively analyze for us. In the interim, we are rebuilding those levees to design levels. So in some cases on the back side of St. Bernard Parish where the levees were not up to design level, our goal is to get those back up to design level.

On the 17th Street Canal, clearly there is evidence of under-seepage as well as a soft layer under there. So what we have done as part of the data collecting effort, once they found that, is to now take the repair of the pile driving down to 45 feet vice the 25 feet where they were previously.

The second thing we will do, that we have already pulled in from that effort that is ongoing, is acknowledging that there may be other locations on the 17th Street or London Canal that are not up to design standards, because there may be something on the ground that we do not now see. So we will close off the lake, and the canals from the lake in order to prevent any other storm surge.

What the research effort that Mr. Dunlop described will also do is both numeric and physical modeling of those canals. So that will give us a better idea as we move to improve levels of protection later on. But in the interim, we will take steps to protect——

Senator VITTER. What about London Avenue?

General RILEY [continuing]. Sir, I don't have much data on that myself. I know it clearly was a breach and involved some deep scouring that I saw and observed. I don't have the data from that, or any assessment now if there is an underlying layer of peat under there that also caused that.

Senator VITTER. Going back to the 17th Street Canal, is there any significant evidence you have seen of overtopping?

General RILEY. No, sir. I have looked at the canal myself, and I have looked at multiple photographs. I have seen some of the interim reports that the American Society of Civil Engineers have

given us. They saw no evidence of overtopping. The typical scour that you see behind the floodwalls, I have looked at a ton of photographs and have not seen that.

Senator VITTER. So just to be clear, that would suggest a pure failure in terms of that system holding up?

General RILEY. That is exactly what we are interested in finding out, what caused the breach, if it was that under-seepage.

What this effort will also tell us is, you had a certain design level, but what were the storm conditions? Were the storm conditions above? It is just not the water level, but you had a tremendous dynamic effort in the canal of the water action. So was it designed for that, I don't know. That's what we need to find out.

Senator VITTER. Certainly, to use layman's terms, the general design level has always been described as category 3. Certainly to my knowledge, there is no evidence that by the time the storm hit there that it was above category 3. Do you know of any such evidence?

General RILEY. Yes, sir. They are already seeing some of the conditions in it. It really wasn't a category 3 design, although it has been described as that. So you are right to say, the description of that. The surge was, the standard project hurricane it was designed against sort of varies between a 2, 3 and 4, depending on whether you're looking at surge, wind or barometric pressure.

As a result of the conditions inside the canal and inside the lake, you already had the storm and the surge waters already pushed into the lake from the category 4 and 5 storm that preceded. By the time it got up there to category 3, it was pushing that 4 and 5 surge down into the city at 125 mile an hour wind speeds.

So I have asked the evaluation team to tell me exactly what went on in the canal, did it exceed or was it under design condition. So we just don't know at this point.

Senator VITTER. OK. I certainly have more follow-up questions. But we will do that in the next round. Now I will turn to Senator Jeffords.

Senator JEFFORDS. General Riley, at our stakeholders meeting, and in the written testimony for today's hearings, one common theme is that the actions we take after Hurricane Katrina with regard to water resources need to be comprehensive. They need to involve flood control, ecosystem restoration, and navigation.

the corps' traditional process is not set up that way. Can you describe what your plans are to respond to this desire to develop a comprehensive approach and if there are any barriers that Congress needs to remove to allow this to happen?

General RILEY. Yes, sir, and thank you for that very good question. We have had in our civil works planning and our civil works strategy a great effort to move toward a more holistic watershed approach. In the particular case of New Orleans, we are working with the State and local agencies and the Federal agencies to bring in all the appropriate agencies to look across the system, not to just look at flood control for one area.

So clearly the inclusion of wetlands restoration is a very, very important aspect of this, as well as how it ties in to the impact of navigation on the flood control system and the hurricane protection system. Within the corps, we have made a lot of changes in our

planning processes over the last couple of years to move toward that approach. We have issued planning circulars, engineering circulars to describe a newer process of how to go about making it more holistic across a watershed view.

Clearly, to your last question of how we could be helped, certainly in any legislation that authorizes a study or project, if that legislation described the need for a more integrated, holistic approach rather than just simply a project focus, I think that would be helpful.

Senator JEFFORDS. The National Levee Safety Program, I would like to refer to that for a minute, General Riley. Given the corps' experience in Hurricane Katrina, can you tell us if you feel that the Federal Government should do more to ensure the safety of our Nation's levee program? For example, should safety standards and an inspection regime be established?

General RILEY. Sir, I think there is an inspection regime. There is not quite, for local levees, the corps or the Federal Government doesn't participate in the inspection regime. I cannot talk to that.

But clearly, I think it would be helpful for Congress and the Administration to look at certain standards for urban areas vice agricultural areas vice other areas. It seems appropriate to me. That is worth discussion.

Senator JEFFORDS. Mr. Chairman, I am disappointed that I have to bring this up. However, I believe that the claims that the environmental litigation is somehow responsible for flooding in New Orleans I think are false and distract from what I believe is the real purpose here, to use water resource investments as a positive tool in the rebuilding of the New Orleans area.

Ms. Mittal, I note that in the GAO's earlier work, the canal levees were identified as a critical element that "should have been considered earlier." There also appear to be have been some disagreements with the local sponsors on how to proceed.

Is it critical that we know what happened with the failure of the canal levees before making judgments about what levels and types of flood control should be provided through the system?

Ms. MITTAL. My response to that, sir, is that you are right. the corps knew as early as 1965 that the drainage canals were a vulnerable spot in the whole system. In fact, the drainage canal work was not included in the original design of the system. It was something that was added on later.

For the first 17 years, while the corps was working on enhancing or building the hurricane protection system, they could not reach agreement with the local sponsors on how to enhance the protection along the drainage canals. In fact, based on the records that we have seen, it was not until the early 1990's that the corps was able to reach agreement with the local sponsors on how to build the extra protection along the drainage canals.

So that is a very important issue and as General Riley suggested, it is something that needs to be studied in terms of why did the canals fail, why did the flood walls on the canals fail and what factors did they consider when they developed that design system.

Senator JEFFORDS. General Riley, the USGS has reported extensive wetland losses post-Katrina. Shouldn't the corps reevaluate its

recommendations for restoration of coastal Louisiana in terms of their feasibility given these wetland losses?

General RILEY. Sir, I think there will be a continual evaluation of that. Clearly there have been losses before the storm and certainly additional losses. So I think in the coastal Louisiana effort that is going on right now, we will include all of that and incorporate it to ensure that we have an approach across the entire wetlands system and how much that contributes to storm damage reduction.

Senator JEFFORDS. Thank you. Thank you, Mr. Chairman.

Senator VITTER. Thank you, Senator.

Senator CARPER.

Senator CARPER. Thank you, Senator, and thanks to our witnesses for joining us today and for your testimony.

This is one of an ongoing series of Katrina-related hearings that I have been privileged to participate in. I am leaving here shortly to go to yet another one. Let me just ask, what questions have you been asked to answer in your testimony today?

Mr. DUNLOP. Well, we've been asked to consider whether or not the forensic study that we believe is necessary to lay the foundation for all of our considerations of these things whether it is realistic to expect that this report in 8 months would be useful or is it going to be too late, is it going to be a day late and a dollar short.

The response we gave to that is that, no, it is a good point made, but no, we have designed this in a way that we think the information can be used. That was the principal question directed to me. Then General Riley was asked some specific questions.

Senator CARPER. General Riley?

General RILEY. Yes, Senator. We were asked to address how we see ourselves working with the Federal and State and local agencies to move forward in an integrated and holistic fashion to meet the water resources needs of the hurricane damaged areas.

Senator CARPER. So that was the question?

General RILEY. That was the guidance we received from the committee staff.

Senator CARPER. Summarize again your response then to that.

General RILEY. Yes, Senator, if I may. What we are doing in many venues across the corps, both in Washington and at the division regional level as well as at local levels, working with the State and local and all the Federal agencies. We work closely with FEMA and all the agencies in the FEMA response and we also have our own authorities under flood control and hurricane protection as well as navigation.

For instance, if I may use an example, this week, just the last 2 days, Governor Blanco and Admiral Allen hosted a 2-day town hall meeting with all the Federal agencies, the State agencies and the parish presidents. That ended last night, so I don't have the feedback from the parish presidents on what the end result was. They were going to give the Federal and State agencies what their highest priorities were.

Second, I am flying this afternoon, Governor Blanco is hosting a reconstruction and rebuilding conference beginning tomorrow morning for 3 days where she is bringing in all the Federal agencies and State and local agencies to participate, not only in large

discussions but in work group discussions to come out of that with, here are the priorities of the State and local interests and sort of here's how the Federal Government can help.

So those are two examples of efforts ongoing right now as we work in this integrated approach with the State and local Governments. We can bring everything we can to bear, but we can't of course do anything, to direct how they want to rebuild. But we provide all the technical assistance we possibly can to do that, and working with the Federal agencies as well.

Senator CARPER. Would you pronounce your last name for me, please?

Ms. MITTAL. Mittal.

Senator CARPER. Has your name ever been mispronounced?

Ms. MITTAL. All the time, sir. No problem.

Senator CARPER. I will try not to do it.

Ms. Mittal, what were you asked to share with us today?

Ms. MITTAL. Our focus was primarily to provide a history of the project. Since the work that GAO did was in 1976 and 1982, we looked at the project very thoroughly at those times. We did comprehensive reviews of the project and we were asked to provide a history of the project.

Senator CARPER. Summarize that again. I realize we only have a couple of minutes, but just take a couple of minutes and in your own words just summarize the history.

Ms. MITTAL. Basically this project has been ongoing for the last 40 years. It has been delayed for a variety of reasons, both technical as well as for challenges and local sponsor issues. It has been expanded and changed over time.

Senator CARPER. Has it been delayed from time to time because of lack of funds?

Ms. MITTAL. No. Lack of funding has generally not been a problem. It has always been a high priority project for the district. But it has changed. There have been technical changes, there have been other modifications made to the project which have delayed its construction. It is still not complete.

Senator CARPER. OK. If you were sitting in our shoes, let me just start with you, Mr. Dunlop, if you were sitting in our shoes, what would you be doing next?

Mr. DUNLOP. Well, sir, we believe that the most important thing for us to undertake in the immediate future is to use the authorities we have, the emergency authorities we have under law to use funds to undertake the immediate restoration of this activity. I think that this hearing itself is a significant function of the committee, because you are providing oversight to make sure that we are using good judgment and it is well considered and it is defensible.

So the most important thing you can do, I believe, right now is exactly what you are doing, and that's conducting this kind of oversight. The other committees of the Congress that provide appropriations have done so. We have made some additional requests in the Administration to have some of those funds reallocated to ecosystem restoration activity right away. That would be very, very helpful for us to have enacted by the Congress at the earliest possible time, that is that reallocation.

But I guess in summary the oversight function right now is probably the most definitive and effective thing you could do.

Senator CARPER. General Riley, same question.

General RILEY. Yes, Senator. Thank you for the question. I guess I have never been asked to advise Congress, but certainly I think——

Senator CARPER. People do it all the time.

General RILEY [continuing]. Yes. In any legislation, sir, that you consider, I think both the need not only to expedite the work but also to integrate the work with all the other State, local and Federal Agency work I think would be very helpful to us.

Senator CARPER. Ms. Mittal, last word.

Ms. MITTAL. I think you need to look at it from a comprehensive standpoint. Engineering solutions may not be the best solutions for the city of New Orleans. We should look at a comprehensive project that includes wetlands restoration, ecosystem restoration and whatever feasible engineering solutions make sense.

Senator CARPER. Good. My thanks to each of you. Thanks very much.

Senator VITTER. Thank you, Senator.

Senator Clinton.

Senator CLINTON. Thank you, Mr. Chairman.

I ask unanimous consent that my opening statement be submitted for the record.

Senator VITTER. Without objection.

Senator CLINTON. Mr. Chairman, I really appreciate your comments at the beginning and then the follow-up questions by my colleagues, because I do think that we are confronting a dilemma here. On the one hand, restoration in the short-term is an important goal in order to expedite the normalization of New Orleans and the surrounding parishes. On the other hand, it is going to take 8 months, apparently, to get the results of these studies. So it is sort of difficult to know how to proceed in the absence of that kind of factual analysis.

There are many questions that I have based mostly on press reports of what the various civil engineering and other scientific experts are concluding, in a preliminary manner. I think Senator Carper's point is a really important one. The Congress is not in a position to integrate and create the comprehensive planning process. Somebody has to be in charge of that. I don't yet know who that is. I don't know the conferences you are going to, the advice you are getting, the direction you are receiving. At what point does the rubber hit the road and somebody says, this is what we are going to do and this is how we are going to go about doing it?

For example, there has been a lot of discussion about the Mississippi River Gulf Outlet. It has very little navigation on it, and many people have urged that it be closed. I don't know whether that's the right thing to do, but who in this process is empowered to make that decision?

I have a special feeling for what Senator Vitter and Senator Landrieu and the other people from Louisiana are going through, because they are doing the best job they can up here trying to figure out how to get the help that their folks need. But I honestly don't know where you turn. I don't know who's in charge.

So I guess I would ask each of you, starting with Mr. Dunlop, who is making the decisions on this? Let's just take the example of the Mississippi River Gulf Outlet. Who might decide ultimately that it should remain open even though it has very little navigation, has never fulfilled its promise, or conclude that this was a mistake and it has served as a supercharged channel through which a lot of water can come and cause damage? I know the St. Bernard Parish Council in 1998 said, close this, it's not a good deal.

So Mr. Dunlop, who would make the decisions ultimately about what is going to happen here with respect to all the engineering issues?

Mr. DUNLOP. Senator Clinton, your question is really right on the mark and it really hits at one of the key policy concerns that all of us would have about how we proceed on these things, so I am delighted that you have raised that point.

The normal way, the conventional way in which the Corps of Engineers receives its funds for projects and activities is through a complicated and lengthy process that involves reconnaissance studies that have to be authorized and feasibility studies that have to be authorized and funded, and then once those are done after several years, then other things that generally stretch out construction of projects as we have heard, 30, 40 years, 11 years is standard for a Corps project. This comes because of the way in which the corps receives its funding and its authority for a project.

What we have asked for as an interim step in the coastal restoration aspect of things, we've asked for the Congress to consider giving us more programmatic or generic authority. A lot of the science, a lot of the engineering is developing, a lot of the state-of-the-art stuff and things, how these things interact, the consequences of doing this here, what will be the consequences over there that are not now known. In the Corps of Engineers we call that adaptive management.

So if we could get authorities from the committee and appropriations in no-year funds so that instead of having to do one thing in a non-integrated way that we could use adaptive management to go along and make changes and modify these things as we learn new information.

Very specifically, as I mentioned previously and as General Riley mentioned also, but we have this request for reallocation of $250 million to be able to allow the Secretary of the Army to make decisions, to go to construction, that is the term they use when they talk about doing stuff, going into construction, for some ecosystem restoration stuff that would be over and above and beyond anything that is in the overall comprehensive Louisiana coastal restoration program that we've got.

So if we could get that kind of programmatic, generic authority, the Secretary of the Army would take that responsibility about when he has sufficient information that he would have to defend before this Congress to go to construction for a particular activity. That would be the most helpful thing right now.

Senator CLINTON. General Riley.

General RILEY. Yes, ma'am, and thank you for the question. If I may give you our perspective on that, Congress of course did authorize the opening of that canal and they will have to authorize

the closure of it. In the process of doing that, we have been asked to study a couple of different aspects of the Mississippi River Gulf Outlet, both environmentally and the economic analysis of that to see if it is still economically viable.

Once that is complete, and that is done with public comment and State and Agency review, Federal Agency review, then we bring that to the Chief of Engineers, he would issue a report to the Secretary of the Army, Secretary Woodley, Assistant Secretary of the Army for Civil Works, who would then, after he is satisfied, present that to Congress for a decision.

So that is the process. That is how we bring in all the different agencies and the public involved in that, including the NEPA process and environmental impact statement. So that is sort of the in-charge piece of how that would work.

Senator CLINTON. Ms. Mittal, do you have any comments? I was very impressed by your report, which I thought was very thorough, easy to follow, 40 years of history in an abbreviated summary form. It was very helpful. Do you have any concluding thoughts?

Ms. MITTAL. The one thing we have heard experts say is that we need to move to a watershed approach for managing our Country. Instead of going from a piecemeal approach, like this is a navigation project, this is a flood control project and this is an ecosystem restoration project, we really need to start thinking in terms of watershed management. I think that if we start moving in that direction, both from a congressional perspective as well as from a leadership perspective at the corps, you could start seeing some of the issues and concerns that you raised being addressed.

Senator CLINTON. Mr. Chairman, I know my time is up. Some of the witnesses we will hear in the next panels make recommendations about the Congress acting quickly to require the development of a comprehensive plan that would be developed by a team. Obviously the corps would be involved, but outside experts and others would be involved as well. It could be led by an independent commission appointed by the President.

I think that this has immediate impact for the Mississippi River Gulf Coast. But it has broader implications for much of the rest of the Country, where we are facing not the level of disaster that you have experienced but certainly a lot of problems that are in the making. They are either already happening or we predict them to, as many people predicted that the levees wouldn't hold in New Orleans.

So I feel like we are, and I agree with Mr. Dunlop, we kind of go in a piecemeal by piecemeal basis, project by project basis. I just don't know if that's adequate to the task that these witnesses have presented to us. So thank you very much, Mr. Chairman.

Senator VITTER. Thank you, Senator. I would put it stronger, I think it's very clearly inadequate, given the last several months. I would urge all of us to at a minimum authorize an integrated, comprehensive structure like you are describing for this immediate are, at least as a pilot to possibly broaden in the future. But to me it is a no-brainer that we need it in a pretty streamlined, quick way for this activity.

By the way, to address your question specifically about MRGO, I already have a provision in WRDA that would, because Congress

does need to act ultimately to close MRGO, we authorized it, we have to de-authorize it, it would mandate for the corps to come up with a closure plan by a date certain within 1-year. It would give the corps authority without even future action by Congress to implement that plan. I hope we can move forward with that in WRDA.

We can have a second round of questions, because certainly I feel like I just scratched the surface.

In terms of the ongoing sort of emergency work that's going on now specifically on the 17th Street Canal and the Industrial Canal, where we are rebuilding to a different design because the prior design was pretty clearly inadequate, are we building the whole canal to that new and different design?

General RILEY. Senator, if I may, we will build it to the design levels. So where we find in this investigation that what we see on the surface was undamaged, if we find something subsurface that needs repair, we need to go ahead and do that.

Now, we don't have a cost figure on that yet.

Senator VITTER. What I'm asking is, for instance, on the 17th Street Canal, you're going down what, 40 plus feet?

General RILEY. Yes, sir.

Senator VITTER. Instead of 20. Are we doing that for the whole length of the canal, both sides?

General RILEY. No, sir, we will only do that where we find that soft peat layer underneath there. Apparently that is fairly localized from the data I have read. So when we complete all the data acquisition, then we can determine the full extent of the damage. But we are actively seeking that, and that is a major concern of ours, that we don't just repair one piece and have the next on both sides of it that are weaker.

Senator VITTER. How broad-based or localized is that peat layer you are talking about?

General RILEY. From what I read, I don't have all the details but I understand it is pretty much around the area that failed. So up to 300, 400 feet. From reports I have read of boring data that they have, it was fairly localized, and the rest of the canal did not have that problem that they saw right there.

Senator VITTER. That surprises me. Why would you expect it to be particularly localized?

General RILEY. I think that's what the borings are finding, the underground borings that they are looking through in the old research. Our study will go further to determine the full extent of that.

Senator VITTER. What about the Industrial Canal? Where is that new design which is a dramatically different design being implemented?

General RILEY. Sir, I don't know of any dramatically new design on the Industrial Canal. It was clearly an overtopping there. So they've got the challenge to determine again what were the exact storm conditions. But what we are authorized to bring it to, clearly, is the design——

Senator VITTER. I was there Sunday and at least for the breach area, they are implementing a dramatically new design which is an inverted T wall going down much deeper than ever before with an-

gled supports under the T. That's very different. So what I'm asking is, where is that new design being built? All along the length of the canal on both sides or not?

General RILEY [continuing]. I do not have those specifics. I would have to get back to you on that.

Senator VITTER. OK, if you could. My concern obviously is that we do the new design only where it breached and it was pretty accidental that it breached in point A and not in point B or point C. So that by next June, in fact, all those other points are going to be basically just as vulnerable as point A was right before Katrina.

General RILEY. We have the exact same concern, yes, sir.

Senator VITTER. That flows into the next question, which is what is your definition of pre-Katrina levels?

General RILEY. Sir, what we want to do is bring it to design levels. So even pre-Katrina, where there are certain areas that weren't to design level, they had either subsided and they needed another lift, our goal is to bring those all up to a proper design level. So even a little bit more than pre-Katrina in some cases, in some breaches of the levees.

Senator VITTER. So you would include in that building back up what has fallen from subsidence?

General RILEY. Yes, sir, absolutely. So certainly clearly in the repaired areas, the Public Law 84–99 is very clear in flood control that you bring that back up to design level, which was above where it has subsided to.

Senator VITTER. In a whole lot of areas, that is going to be several feet above where I was?

General RILEY. Yes, sir, I agree.

Senator VITTER. Now, let's take a next step. When that system was originally designed, a lot of things were different, including the wetland buffer outside the system. Are you going to take that into account and buildup to the true protection that was supposed to be which it no longer offers because of those changes?

General RILEY. Sir, we need to take all that into account. We are not there yet, though. We don't have that level of detail.

What we have now is the level of detail of the design that it was before the storm. So what you are talking about is a design after the storm as a result of that. We don't have that, but it is clearly necessary to do.

Senator VITTER. But will you have that and do it by next June?

General RILEY. Sir, I don't know. On that one, I really haven't given that much thought on the impact of loss of wetlands and what we can do because of that before June of next year.

Senator VITTER. Well, it's a pretty major question if you all can get back to me. It seems to me you have present authority to do that, because that is not going beyond the original mandate of the system. It is updating the system to that original mandate.

Mr. Dunlop.

Mr. DUNLOP. Yes, sir, if I could address that. I don't mean to be a Johnny one-note, but you know, I have mentioned three times the $250 million reallocation specifically to attend to those kinds of things. It might be of interest to you, if you would indulge me showing you some photographs that I'm sure you might have already seen, sir.

Here's an example of what you are talking about. Here is a photograph of a wetland area near Fort Pike. This area that you can see in green is where there is vegetation. The darker area is where the storm scoured away the vegetation. We would probably use some of that $250 million to go into and get some sediment on top of this before it, or in places like this, if not this particular place, this is all over the coast where you have had the scouring, where we could prevent this from turning into open water, which would address the kind of thing you are talking about.

Senator VITTER. Would you also use some of that money to upgrade the system to take into account 30 years of that sort of activity?

Mr. DUNLOP. Yes, sir, I would think that the $250 million that I'm referring to isn't the additional $1.6 billion to tend to the structures and levees and things. But specifically to the coastal wetlands.

Another example, and I don't mean to over-speak, but here are some barrier islands before. Some of that $250 million might be used in certain areas to fix some of these barrier islands. It would be maybe a little bit of a drop in the bucket.

Senator VITTER. Just to be clear, you agree you have the authority to do that if we can get you the money?

Mr. DUNLOP. Well——

Senator VITTER. I think that's what you just told me.

Mr. DUNLOP [continuing]. If we get the money——

Senator VITTER. You said if we get the money, this is what we are going to do.

Mr. DUNLOP [continuing]. If we get the money in the appropriations reallocation, I think there is a standard assumption that those funds would be de facto then authorized to be used for that purpose. Because the nature of the request says that the Secretary of the Army could use these funds to do these kinds of things.

Now, specifically doing this, or here's another example that might address your question specifically, there is a structure at Canaravan, which is north of New Orleans. It is a flood control structure. It is authorized by Congress to move water into this area here where you see the green in the event of a flood. It is not authorized by Congress to move sediment. That is how granular we get in some of these authorizations.

So what we would do is use some of that $250 million to go in and you can see that before, the green was where there was vegetation, the blue is now where it's open water. We believe that if we could begin to take actions now with some of that $250 million, we could rescue this back to where maybe we could get this vegetation back if we could move some sediments and things like that in.

Specifically, we are not authorized under current uses of the Canaravan structure to move sediment. But we believe if we got an appropriation of the sort I have talked about, the reallocation of existing appropriations, and it was done in the fashion that we have asked, making the money available to the Secretary to use it for these funds, we could do this kind of thing.

Senator VITTER. OK. Final question, because I am way over my time, I want to get to Senator Jeffords, will you do the same thing if we get you the money with regard to upgrading the levee protec-

tion system to its original design grade, given the degradation of wetlands and other things in the last 30 years?

Mr. DUNLOP. I think General Riley's testimony is to the extent that we have information and data that would inform that, that would certainly be our intentions.

Senator VITTER. Senator Jeffords.

Senator JEFFORDS. General Riley and Mr. Dunlop, can you comment on the degree to which having a dedicated revenue source for Louisiana flood protection would affect your ability to complete a comprehensive project in a timely manner?

General RILEY. Sir, I guess your question goes to dedicated and appropriation. I am not sure if we need a dedicated appropriation. Clearly we've got some authorities now, we are looking for other authorities in the coastal Louisiana hurricane protection system for those areas. I guess that would be the extent of dedication. I am not sure if I am getting to your question or not, though, Senator.

Senator JEFFORDS. Well, let us work together on that and make sure you get what you need.

General RILEY. Yes, sir, thank you.

Senator JEFFORDS. Ms. Mittal, it is worth noting that the Barrier Plan experienced significant local opposition at the time documented in part by an informal poll conducted by Congressman Livingston, which showed that 62 percent of New Orleans residents either opposed the barrier or wanted to wait to construct it until studies were completed.

I ask unanimous consent to submit for the record a complete record of the House hearing discussing these issues.

[The referenced material was not submitted at the time of print.]

Senator JEFFORDS. Ms. Mittal, can you describe what GAO found out as to the reasons for the corps' abandoning the Barrier Plan?

Ms. MITTAL. After the court order that enjoined the corps from constructing the barrier part of the Barrier Plan, until they prepared a revised environmental impact statement, the corps considered several things. One was how much time it would take to complete the environmental impact studies that would be necessary to address the court's concerns. What they told us at that time was that they did not have the in-house expertise to conduct those studies, and that in order to complete the environmental impact studies, it would take a lot of resources and a lot of time.

The other issue was, as you just mentioned, the local opposition. This project is a joint partnership between the Federal Government and State and local sponsors. the corps takes into consideration the extent to which the local sponsors are supportive of the project as part of their decisionmaking. The local sponsors, as you just noted, were very much against building the barriers because of the effect, the detrimental effects that they believed that the barriers would have on the Lake Pontchartrain ecosystem.

The third issue that the corps considered in the mid–1980's when it changed its decision was the cost of the plan. the corps usually goes with the most cost-effective plan. What they found was that because of the time it had taken to build the Barrier Plan, the Barrier Plan had increased in cost significantly. It had become nine times more expensive to build the Barrier Plan.

And the High Level Plan was no longer the more expensive plan. It was actually the most cost-effective plan. So there were three factors. One was the environmental impact statement that they had to prepare, the second was the local opposition and the third was the cost-effectiveness of the High Level Plan versus the Barrier Plan. That was what caused the corps to change its decisions.

Senator JEFFORDS. General Riley, the NAS report released today expresses some concern about the completeness of the corps' restoration plans for coastal Louisiana. I know the corps has completed more extensive analysis on a more comprehensive plan before the Administration insisted that it be scaled back. Can you describe the difference between the original, more comprehensive plan and what was proposed to Congress earlier this year?

General RILEY. Sir, I think as part of the planning process, we looked at the entire system across the coast and looked at comprehensively integrating all aspects of that. What the Administration said was, OK, you've got this overall conceptual blueprint, is really what it was, now let's propose to Congress what we can do now and quickly in the near term to move this project forward quickly.

So I think that is the essential difference, take your large, comprehensive concept that you have and then what can you do and what can we offer to Congress to authorize and appropriate in the near term.

Senator JEFFORDS. General Riley, I have a question that I have tried a couple of times to get an answer to regarding notification and emergency planning. I am going to ask it again as I believe that it has national implications for Corps flood control features. What process did the corps have in place prior to Katrina for providing notice and warning to Federal, State and local officials about the status of the levees before the storm arrived and after the levees failed?

General RILEY. Senator, from two aspects, first, we conduct annual inspections. We turn the levees over to the locals, so the locals operate and maintain the levees. We conduct annual inspections, they are out there daily and weekly maintaining the levees. We conduct a joint annual inspection with them and make those inspection results public.

So that is a notification on the status of the levees pre-storm.

During the flood, again the local levee boards will all be along a flood levee observing and participating in communications. Of course, during a hurricane you can't do that, you have to evacuate. So in this case, in the particular case, instant case in New Orleans, they had the local citizens that were there on the ground that they called in to the State, I was in the State EOC, the local sheriff's department and the director of homeland security for the city called into the State.

I was right there with the State sheriff, so there was immediate notification that went out post-levee breach of the levee breaches that went out through the city, through that system that they had with the available communications that we had. So we were there, Corps, FEMA, Federal agencies right there in the State emergency operations center where some initial reports came in and immediate notification went back out.

Senator JEFFORDS. General Riley, as a follow-up question, was that process used effectively and have you made any changes as a result of Katrina, and have you applied these lessons learned to other flood control features such as the Waterbury Dam in Vermont, where thousands of people live minutes downstream?

General RILEY. One thing we clearly learned, I think all the Government agencies learned and locals, was the difficulty of communications when a massive storm comes in and you wipe out your cell phone network. Even our satellite phones, after 2 days, had difficulty.

So an improvement in our communications ability clearly is important for that kind of notification. Then in close conjunction, working with the local levee boards to make sure if they can get out on the levees to get out and watch them over time. In a hurricane, it is a different story, though, and you have to rely on people that are in bunkers and hurricane protected bunkers to get out and observe as soon as they can get out when the storm passes.

Senator JEFFORDS. Thank you.

Senator VITTER. Thank you. I just have a few follow-up questions before we go to the second panel.

I am very happy to hear everybody talking about a new, integrated approach. I have been preaching this for a while, so I hope this is a developing consensus. It seems to me this is not going to happen unless we have a new and different structure to make all this happen. Is the Administration going to propose such a structure, such a fundamentally different structure to make sure this new, integrated approach happens on a more streamlined basis?

Mr. DUNLOP. Well, Mr. Chairman, I think what we are trying to do in the chief's report and the leadership that you yourself have provided in the Louisiana coastal area wetlands restoration program, we have tried to take that, the lessons that we learned from the Florida Everglades restoration activity, and we put together a system of partnerships with the State and other Federal agencies and other local entities to manage the way in which we are redoing the Florida Everglades.

We tried to take those lessons learned and apply them to the Louisiana coastal area restoration activity. We believe that the legislation that you have passed from your committee and which is awaiting consideration in the Senate has a lot to commend to it as a mechanism to move forward on that front.

As regarding the structures that we have been discussing, the levees and the storm protection structures, the process that we are taking now is, as I indicated in my testimony, part of what the White House has put together as a cabinet council coordination activity. We believe that with the existing authorities of different agencies of Government that we can effectively carry out those activities if we get appropriate authorizations and appropriations to undertake the work.

Senator VITTER. All of that is way shy of what Senator Clinton and I were suggesting in terms of a different structure, a commission to have clear programmatic authority to get this done on a region-wide basis. Are you all, meaning the Administration, going to suggest such a new structure? Because it seems to me without that, talk of this new integrated approach means we go to a bunch

of conferences and talk to a bunch of different agencies, and then day to day it devolves into the same fragmented way of doing things.

Mr. DUNLOP. Yes, sir, it could happen that way. I am sure you are correct. Although I do believe that if we take some of these programmatic approaches, my testimony would be that the Secretary of the Army, with appropriate oversight from Congress, of course, and all the rest, would be able to be most effective in executing those types of decisions to do those things without a new layer of bureaucracy and a new layer of Government.

But ultimately that will be Congress' judgment to make, because we execute those laws that you enact. We do it faithfully, we trust.

Senator VITTER. OK. Ms. Mittal, I want to ask this question for the chairman. He wanted your thoughts for the record on, was the GAO testimony before the House Appropriations Committee correct involving the choices between different hurricane protection plans in the past?

Ms. MITTAL. For the record, sir, when we prepared that statement, there was very little known about what actually caused the levee breaches. In the last 4 weeks, there has been a lot more information that has become available on what caused the levees to actually breach. When we prepared our statement today, we tried to incorporate that information, and therefore we revised the statement that we prepared in September.

Senator VITTER. Again for the record, highlight the differences between what you are saying now versus that House testimony.

Ms. MITTAL. In the September testimony, we obtained some general information from the corps about funding levels and also construction status as well as some general opinions from Corps officials about what they believed had caused the breaches. We now know that there are many more reasons that resulted in the breaches and that's why we made the changes to our current statement.

Senator VITTER. OK, Senator Isakson has arrived. Senator, do you have questions?

Senator ISAKSON. I apologize for missing the testimony. I will save my questions for the second panel. Thank you for being here.

Senator VITTER. Senator Jeffords?

Senator JEFFORDS. Ms. Mittal, did the High Level Plan barriers fail?

Ms. MITTAL. The High Level Barriers on the lake side, according to the preliminary results, indicate that those actually performed very well after Hurricane Katrina. The part of the High Level Plan that failed would be along the drainage canals, and that I believe the corps is still in the process of investigating why those breaches occurred.

But the parts of the High Level Plan that were along the lake front, those actually performed very well, according to preliminary results.

Senator JEFFORDS. Thank you.

Senator VITTER. Thank you all very much.

Now we will have our second panel, if they will approach the witness table. As our next panel of witnesses approaches, I am going to go ahead and introduce them. We have Mr. Windell Curole, Gen-

eral Manager of the South Lafourche Levee District; Mr. Peter Brink, Senior Vice President for Programs with The National Trust for Historic Preservation; Mr. Scott Faber, a Water Resources Specialist with Environmental Defense; and Mr. Steve Ellis, Vice President of Taxpayers for Common Sense.

We will begin with Mr. Curole. Windell, thank you for joining us.

**STATEMENT OF WINDELL CUROLE, GENERAL MANAGER, SOUTH LAFOURCHE LEVEE DISTRICT**

Mr. CUROLE. Thank you very much for the opportunity to testify here today.

Being the only person from Louisiana besides yourself, my whole life ancestry is coastal Louisiana. Seven generations in south Louisiana, five generations living on the coast. Hurricane of 1893 hit, I had 7 out of my 8 great-grandparents living on the coast, they retreated 12 miles inland as far as 45 miles inland. In 1915, they retreated 15 miles inland and continued to retreat inland.

So these five generations of living on the coast line, yet here in Louisiana when you look at oil support, seafood, 30 percent of the oil in the 48 States, you look at the trade on the port, the reasons to build the coast line are still there. But we are the only community in the United States basically with a population that is still retreating from the coast line. Some people say, why are you there? We are there because that is where the business is. But we have Port Fourchon, which supports 75 percent of all deep offshore oil. U.S. Treasury gets $5 billion from that support every year. Yet at that port, you virtually have no one living there. They all live 22 miles further inland in the levee system that we have constructed.

The other thing about our area is that the uniqueness of it ties in culturally and also geographically. Culturally, I am the first generation of those seven generations to learn English before French. When I grew up, our communities in south Louisiana, along our bayou, were French-speaking. Now they have converted to English. But it is because this area is so unique, with all the tremendous productivity. The only place that can match it might be Alaska as far as making it really easy just to get a meal. Like one gentleman said, if you are ever hungry in south Louisiana, it is because you are on a diet.

But you look at the geography of south Louisiana, it is the understanding that this major river, people forget how important the Mississippi River is, that the force of that river draining 41 percent of the United Sates built south Louisiana. South Louisiana is a gift from the river. It was actually built by the flooding of the river. Basically the Gulf of Mexico and the river have been in a battle to the river building land and the Gulf trying to take it back. We find ourselves today, after the 1927 flood, we became very good at stopping the flooding of the river, although that was actually the life blood that actually built the land to begin with.

So with this situation, I think 1947 was the last time we had a major crevasse. You talk about major flooding, New Orleans' biggest threat, even when this tremendous disaster took place, flooding from the Mississippi River at high river would be more of a disaster because the water would continue flowing for maybe months

at a time, and not just the lower areas in New Orleans flooding, but the entire city.

So you look at this place, this geography, and it makes things very different, a different approach. It is very important to understand why we are there. We are a pass-through. When you look at 30 percent of the oil and gas coming into this Country, the energy needs to come through there. The area that I am involved with, in my district that I work, we have the only deep offshore oil port, 1.2 million barrels a day of foreign oil comes through our parish. It provides good taxes and energy to the rest of the Country.

Senator JEFFORDS. What were those figures again?

Mr. CUROLE. One point two million barrels a day. Actually, that structure was designed for only a million barrels a day. But the demand is so large. In fact, I sit on their safety panel. They were talking where the storms had hit, they have had their customers, 80 of these supertankers backed up because of the problems.

Right alongside that pipeline, the Morris pipeline from deep offshore oil, was producing about 350,000 barrels a day. But because of the damage from Katrina, no oil is coming through there. But in the same corridor, British Petroleum is about to put in the Mardi Gras line and this is supposed to be about 600,000 barrels a day.

So the importance of why we are where we are is the support of these things that provide for the rest of America.

We looked at the 1927 flood. Although when New Orleans was first established there was a need for levees, and they started building levees immediately, there has always been the need to improve that levee protection. But until the 1927 flood, the success wasn't great. Since that time, we have been very good at it. They did form a new commission, a new way of doing business. It changed the way the United States looked at that flood protection. We think what has happened here, we need to do the same type of thing, we need to look at it differently.

What I find in dealing with most of the professionals in Government, very good people, very good. But they are more research and planning. They do a good job. But when you have a business, research and development does their research and development, but the chairman says when you move forward. I think what we do is we mix sometimes the research and development mentality gets to the leadership. That's why I think some type of separate group with the marching orders to move forward, sometimes doing 70 percent of an answer is enough to move forward.

Especially with the battle that we have in south Louisiana, we have a very changing—the environment changes very quickly. We need to get things done.

I need also to mention that I am the manager of a Corps of Engineers project, local sponsor, the Larose to Golden Meadow project. We were the only system south of the intercoastal that didn't flood. Now, it was a combination of things. First, we were lucky. You get a category 5 hurricane, there is no place on the United States coast line that wouldn't be devastated. You look at Waveland, MS. They are talking about water elevations up to 30 feet.

In fact, I was reading a book on the 1938 hurricane that hit Providence, RI. Fifteen feet of water in Providence, RI, with about 700 people losing their lives.

So No. 1 of the things we need to understand, major hurricanes will cause damage anywhere they hit in the coastal United States. But understanding the comprehensive work that needed to be done to handle the flooding of the Mississippi River, I think we look now in trying to deal with those issues the same way in coastal Louisiana.

Again, growing up in the area, if you are a community in south Louisiana, it makes sense to have your hurricane protection, your hurricane evacuation routes, your navigation, your businesses, also the natural production that you have, the great estuaries that we have on the Barataria side and the Terrebonne side, that these things have to work together. It is just common sense.

I have been trying to promote this idea for a number of years. But you know, it almost takes disaster to make things happen. Even in the Netherlands, where they spent 600 years taking land from the Zeiderzee, it took the 1953–54 flood for them to get very serious about it.

Well, now I think the mule has been hit in the head with a two by four. We need to do comprehensive planning to go forward. Thank you.

Senator VITTER. Thank you very much.

Mr. BRINK.

**STATEMENT OF PETER H. BRINK, SENIOR VICE PRESIDENT, PROGRAMS, NATIONAL TRUST FOR HISTORIC PRESERVATION**

Mr. BRINK. Thank you very much for the opportunity to testify. I am representing The National Trust for Historic Preservation, America's largest private preservation organization actually chartered by Congress in 1949.

As the people of the Gulf Coast move to restore countless historic homes, buildings, and landscapes damaged by Katrina, there are critical roles that Congress can and should play to ensure that historic properties and neighborhoods in this region are afforded the maximum possible protection against catastrophic storms.

This part of the Country has an enormously rich history with one of the largest concentrations of historic buildings in the United States. These are important for their own sakes, but historic preservation is also a powerful force in the local, State and national economy. In Louisiana, culture means business.

This is why we are participating in the national advisory board that Lieutenant Governor Mitch Landrieu has put together to develop a detailed action plan to rebuild Louisiana, relying on its cultural and historic assets. Prior to Katrina, his office conducted a comprehensive study that showed that the cultural economy was growing faster and creating more jobs than any other sector of the State's economic clusters. This powerful force should be one of the tools we use to attract reinvestment in the hurricane damaged areas.

A pre-storm survey shows that 28 percent of those visiting Louisiana came to enjoy its distinctive neighborhoods and visit individual historic properties. With regard to New Orleans, 10.1 mil-

lion people visited in 2004 and spent $5.5 billion. Seventy-five thousand people in New Orleans are directly employed by the travel industry.

Louisiana ranks sixth in the Nation in rehabilitation activity using the Federal Historic Rehabilitation Tax Credit. Contrary to some misconceptions that historic preservation's benefits are lost on those of low and moderate income, over 60 percent of America's national register historic districts overlap census tracts where the poverty rate exceeds 20 percent.

Moreover, the Rehab Tax Credit can be used in conjunction with housing and new markets tax credits to spur the creation of affordable housing and revitalized neighborhoods serving business corridors. This is exactly what we need to do.

I visited southeastern Louisiana in September. I might also mention that I led the preservation effort in Galveston, TX for 17 years. So I have been through hurricanes and disaster response on the ground. The damage in New Orleans to buildings is catastrophic. In New Orleans alone, the National Trust onsite survey teams estimate that Katrina's devastating winds, rain and subsequent flooding have in some way affected the 38,000 contributing structures in the city's historic districts.

In New Orleans, unlike almost any other American city, there are 20 National Register districts that cover more than half of the land area of the city. These are made up of residents of every income level.

I saw first-hand that the world-known French Quarters and Garden Districts are largely intact. That was wonderful news. But the downtown heart of the city beats in lesser-known neighborhoods, such as Holy Cross, Tremay, Broadmore and Mid-City, where designated historic districts have the creole cottages, corner stores and shotgun houses that are essential ingredients in the rich architectural mix that is New Orleans. Preserving as many of them as possible is essential to preserving the city's very character.

In order to save that history from being lost forever, the Trust urges the committee to safeguard coastal Louisiana's legacy by supporting the following four basic principles. One, provide the best infrastructure for the Nation's premier historic area. Congress should provide all necessary resources to rebuild a levee system that recognizes the need to protect the Nation's richest inventory of historic treasures.

This includes the city's levees and completing a comprehensive system of hurricane protection in the whole area once and for all. It should anticipate the worst, a category 5 hurricane as well as a slow, drenching storm.

Two, restore and redevelop protective wetlands. Natural water resources must complement man-made infrastructure to mitigate the damaging effects of future catastrophic storms. Erosion along Louisiana's coast has eliminated over one million acres of wetlands.

As a result, the Army Corps' own hurricane protection levees have become more vulnerable. They were built with the understanding that they would be buffeted from winds and storm surges by 40 to 50 miles of protective swamp and marsh. The communities these levees protect are now constantly vulnerable.

Three, assure full compliance with the National Historic Preservation Act's Section 106 requirements. Thorough Section 106 review must be part of any Corps work. This is a process that protects and balances the different interests involved.

Four, use historic preservation as a tool for revitalizing coastal Louisiana's economy wherever feasible. In this, we have introduced, and I would be glad to answer in Q&A, specific suggestions for preservation grants, streamlining of tax incentives and a pilot homeowner's tax credit.

All in all, we think historic preservation is a framework for everything that should be done in the recovery, and I would be glad to talk more about how that can be done.

Thank you.

Senator VITTER. Thank you, Mr. Brink. Mr. Faber.

**STATEMENT OF SCOTT FABER, WATER RESOURCES SPECIALIST, ENVIRONMENTAL DEFENSE**

Mr. FABER. Thank you, Mr. Chairman. I just want to echo your opening statement, the notion that we have to quickly, very quickly identify ways to improve our existing flood control infrastructure, that we have to quickly identify opportunities to relocate vulnerable homes and businesses in harm's way, and that we must at least begin the thorough restoration of our lost coastal wetlands and barrier islands.

Our fear is that nothing less than the future of New Orleans is at stake. If we can't provide assurances that we can provide a category 5 level of protection to New Orleans and the surrounding parishes, our fear is that business leaders, community leaders will not reinvest in the city's future once again. I just want to summarize by making four central points.

One is something you have alluded to, Senator Clinton alluded to, the notion that we need to create an independent commission to develop a comprehensive plan to provide a category 5 level of protection for New Orleans and surrounding parishes. In our view, the Congress should immediately create, or authorize the creation of a commission of three national experts of national reputation appointed by the President after consultation with the Governor to develop a comprehensive plan that provides the required level of protection.

Our sense is that a commission can do more and provide more resources, provide more expertise than the Army Corps of Engineers alone can provide today, and that it will provide the accountability that many Americans, many Members of Congress are seeking as we make a major reinvestment in the region.

The second point I would like to make is that we should make an immediate down payment of $10.5 billion in the next supplemental appropriations bill to begin the restoration of our lost coastal wetlands and barrier islands and to begin efforts to improve our levees and other flood control infrastructure. Contrary to what you might have heard, we can begin today and build many of the restoration projects, diversions, pipelines, other projects that can today begin to restore much of what has been lost in the last 75 years.

This is one of many volumes of a draft study that was not released in 2003 that identifies literally scores of projects that could be built today to help begin the long overdue restoration of this natural hurricane buffer system. We shouldn't wait another day to begin those efforts.

As you have heard before, these wetlands are critically important to the protection of our homes, our businesses, our oil and gas infrastructure. For every 2.7 linear miles of wetlands that we restore, and I brought a copy of a report by an LSU professor, Greg Stone, that I am sure you have become aware of. For every 2.7 miles of wetlands we restore, we can reduce storm surge by approximately 1 foot. If we had begun to restore lost coastal wetlands and barrier islands 30 years ago, when scientists first began to understand the consequences of the loss of our natural hurricane buffer system, then the storm surge created by Hurricane Katrina would have been dramatically reduced.

The third point I would like to make is that we should not wait to close the Mississippi River Gulf Outlet. As I speak here today, we are in the process of repairing the levees along MRGO, also known as the hurricane highway. It seems irrational, frankly, to reload the shotgun, to rebuild those levees, to continue to leave those parts of New Orleans vulnerable to a storm surge that has been increased anywhere from 20 to 40 percent by the construction of MRGO.

If there were a significant amount of traffic on the waterway, then I think there would be an argument perhaps that we should keep it open. But given the low levels of traffic, given the fact that traffic has fallen to less than 50 percent of what the corps predicted when the project was constructed, it simply makes no sense to continue to operate a waterway that poses such a significant threat to people and property.

The last point I would like to make is a general point. We need to set much clearer priorities for our water resources spending. At the same time that overall spending on Army Corps construction and maintenance increased from $3.2 billion to $4.7 billion, we saw a significant decrease in the amount of money that we were spending to upgrade New Orleans' levee protection system from roughly about $15 million a year to about $5 million a year. That seems to me a case of seriously misplaced priorities.

I think it is important for this committee to create an interagency council to help the corps and the Administration and the Congress make better judgments about what our national civil works priorities ought to be. We should only be building the most important projects, worthy projects. We should subject our most costly and controversial projects to independent review. We should prioritize those projects to make sure that we are putting people and property first.

So let me just close by saying that as we rebuild, we think it is critically important that we provide a higher level of protection than we had just 3 months ago. Thank you, Senator.

Senator VITTER. Thank you. Mr. Ellis.

**STATEMENT OF STEVE ELLIS, VICE PRESIDENT, TAXPAYERS FOR COMMON SENSE**

Mr. ELLIS. Thank you. Good morning, Mr. Chairman, Senator Jeffords, Senator Isakson. I am Steve Ellis, Vice President for Programs at Taxpayers for Common Sense, a national, non-partisan budget watchdog.

I would like to commend the chairman and the committee for holding this series of hearings.

In the Gulf Coast region, we are faced with a significant challenge: the need for speed and the need to do it right. As a budget watchdog, I would add that we need to do it fiscally responsibly as well. The outpouring of individual support for this relief effort, which has already reached $2 billion, shows just how important this issue is to the American people. We owe it to the American people to spend their tax dollars wisely, to rebuild effectively and intelligently.

The fundamental responsibility of Government is to take care of its citizens. In the area of flood and storm damage reduction, it is clear that the Government has failed. We spent $123 billion on flood control projects in the last century, but annual costs from flood damages have increased from $2.6 billion annually in the first 50 years of the 20th century to more than $6 billion per year over the last decade of that same century.

Right after Katrina flooded New Orleans, the airwaves were full of Army Corps of Engineers officials stating that the levees and floodwalls performed as expected. They provided category 3 protection and Katrina was a category 4 storm. But according to recent testimony and what we heard today, Katrina was no longer a category 4 hurricane when it hit New Orleans. Independent engineering panels found that the levees and flood walls did not perform to design or promise.

If it is true that the levees were brought down by shoddy craftsmanship, we need to know whether this was an isolated case or whether this is just one of many projects nationwide that we should be concerned about. We need to take a close look at how the corps supervised construction. In one of my jobs with the Coast Guard, I was the contracting officer's technical representative for a boat construction contract. In that capacity, I learned that inspection and oversight is as important as the initial construction itself.

the corps' failures in overseeing the New Orleans flood protection is quite possibly the most troubling incident in the Agency's recent history. Here are a few principles that TCS would urge the committee, Congress and the Administration to consider.

Rethink the level of protection. First, New Orleans must get the category 3 level of protection that it was promised before Katrina. However, we cannot expect any levee to automatically meet all our needs just because the corps has deemed it a category 3 or even a category 5. Mother Nature is very creative, versatile and powerful.

We can mitigate risks with levees, floodwalls and constructed wetlands. But the risk of catastrophic flood damage will always be there. We should endeavor to obtain significant protection from a variety of threats, not just a repeat of Katrina.

Identify what to rebuild. Although it will be a difficult process, we will have to identify areas that are too damaged or so vulnerable to future storms that they should not be rebuilt. Just like after the great Midwest flood of 1993, this is a difficult task that has to be managed and led by Louisianans.

But the Federal Government needs to be clear that if individuals want to rebuild in high-risk areas, they should do it without the aid or encouragement of Uncle Sam. In past crises, some affected towns have responded by relocating out of the flood plain. Also, critical infrastructure should be moved out of the flood plain where possible.

Reevaluate our policies. Our Nation's water resources policies are antiquated. The Principles and Guidelines, the rules governing the Corps of Engineers' project design and selection, are more than two decades old. We need to update those rules to fully account for all costs and benefits of Corps projects, modernize economic procedures, and remove biases toward large construction projects.

We have a $58 billion backlog of Corps of Engineers projects and the Agency has a roughly $5 billion budget. Rather than pumping up the corps budget, as some insist, we must establish a system of prioritizing project investments so we don't squander precious tax dollars maintaining waterways with no traffic, rather than constructing essential flood damage reduction projects.

Flood insurance has been a failure. FEMA estimates that flood insurance claims this year will exceed $22 billion, more than in the whole history of the program. But the National Flood Insurance Program has the capacity to pay about $2 billion per year.

Further, our policies discourage adequate flood protection. Since the typical homeowner does not have to buy flood insurance if they have 100 year flood protection, we have essentially dumbed down our flood protection to the 100 year level.

Let the economy help itself. Congress has already been asked to fund the do everything for everyone approach. Small business, the oil and gas industry, fishing industry, the port all are seeking significant Federal support to get them back on their feet. We strongly urge the incentives to be small, targeted and short in duration. Some businesses or infrastructure may have been inappropriately located at high risk from storms. Taxpayers should not subsidize them to be built right back into harm's way.

Forward thinking. There are a lot of plans on the books for providing flood protection for New Orleans and Louisiana. We must resist an urge to simply dust them off and get building. Our approach to providing adequate flood protection must be integrated and multi-faceted, and it must be tailored to include lessons learned from this unthinkable tragedy. A czar overseeing Federal reconstruction has precedent and makes sense.

Finally, the major concern for Taxpayer for Common Sense: cost. The Nation needs to set some investment priorities in the Gulf Coast region. We cannot afford to protect everything everywhere and pay everyone to come back. We had a $317 billion budget deficit last year. We are fighting a war. New Orleans is important and the Gulf Coast is an important, valuable investment. But we have to target our funding wisely.

Thank you very much for inviting me here to testify. I would be happy to answer any questions you might have.

Senator VITTER. Thank you very much. Now we will get to questions.

Mr. Curole, could you share with the committee your experience in building the Leonteria lock?

Mr. CUROLE. Well, it's a long and depressing story. Back when the study was first done for the Larose to Golden Meadow hurricane protection project, the floodgate in Golden Meadow was looked at and even mentioned that it might have to convert to a lock. We completed the construction of that floodgate in 1985.

By 1990 it was obvious that this floodgate, which was designed to close only during hurricanes, due to subsidence problems it was allowing flooding to take place. South winds were blowing, water was getting into the system where we had to start closing the floodgate to stop the waters from coming in and inundating the communities.

Once we closed those floodgates, we stopped our oystermen, our crabbers. The fuel, the drilling mud and the other things that go to Port Fourchon, again, that support 75 percent of all deep offshore oil in the Gulf. So that became a problem. We were able to document that problem. In 1996, we asked the corps to move forward with working toward getting this completed. They wrote back saying that they would have a study done, and probably within a year, have the study complete. The study was completed, I think, 2 months ago.

We could not afford to wait on that situation. In 1999, we had requested Congressman Tauzin to help us in urging the corps to move forward. There was some language in the WRDA bill with the intent to urge the corps to move forward. Our project was not on the back burner. It was probably evidently behind the stove. So we were doing everything we could to move it forward.

With that interpretation of the 1999 WRDA, they looked at it as new authorization and basically it just caused more problems for the project. We finally had to say, well, we hired a local engineer and are sort of designing the project ourselves, started the report. There were Corps individuals who did work with us in getting this done. The report has been done, the corps has been doing oversight and that has worked out well.

We are actually in the process of building the structure right now with zero dollars from the corps. We hope to have it in place next year. It was just a problem, it obviously is a problem that helps the national need. It was talked about in our original authorization. Yet all these years later, and we still haven't resolved that issue. But we will build it and we will put it in place.

Senator VITTER. Thank you for all your leadership there on the ground. I am going to bounce around during my time. Mr. Ellis, some have quite frankly suggested that New Orleans as a significant city should not be rebuilt in the same place. What is your reaction to that?

Mr. ELLIS. Well, I have a personal tie to New Orleans. I actually flew my wife down there to get engaged. So I certainly have a great affection for the city and for the area. I think New Orleans——

Senator VITTER. I am sure Taxpayers for Common Sense won't let that impact their policies. So why don't we go to that organizational viewpoint?

[Laughter.]

Mr. ELLIS. The organizational viewpoint is that significant portions of New Orleans were not damaged in this hurricane. New Orleans is always going to be vulnerable to hurricanes, and that is something that it is going to have to be dealt with. But I think that absolutely we should be looking at rebuilding, and maintaining that great city. That is my personal and our organization's view.

That said, I don't think it will look exactly the same that it did before Katrina. I think that is responsible.

Senator VITTER. You also talked about prioritizing what we do there. Where on that priority list should be a more robust system of hurricane and flood protection?

Mr. ELLIS. I think that in looking at some of the lessons learned from previous large natural disasters, for instance, the flood of 1993, the recommendations there are that if you have highly urbanized, densely populated areas that are at flood risk, they should receive the highest level of protection possible. I think that is exactly going to be the wisest approach, and it should be a significantly high priority, you know, we will have to look at it compared to everything else.

Everybody I have heard seems to agree that getting to level 3 by next hurricane season is the first and highest priority and then we go from there identifying what we are going to do to get to a significantly higher level of protection. I fully recognize that there may be some investments that we are going to make in the next several months, in doing that, that's going to be lost. Because of the change or whatever, or going to category 5, those investments are going to be lost. But I think that is the responsible approach, at least in the short term.

Senator VITTER. Given those priorities, what is your reaction, or Taxpayers for Common Sense's reaction to the fact that we have now appropriated almost $70 billion or spent, counting tax issues, almost $70 billion? Not a penny of that is for higher level protection.

Mr. ELLIS. Right. Although in the President's recent recommendation, he was essentially reallocating some of the $60 billion in appropriations that has not been spent and is not expected to be spent out of the disaster relief fund during that time. I think that is a wise decision, to shuffle that deck.

Senator VITTER. But none of that reallocation goes to a higher level of protection.

Mr. ELLIS. Right. We are going to have to go forward from there. One of the things that our organization did when we first started hearing the estimates that it is going to be a $200 billion cost for reconstructing in the Gulf was come up with our own offset proposal. We provided our own, it is on our web site, www.taxpayer.net, and it has basically every other organization's that we could find, offset proposals to try to find a way to offset the cost of what we are going to have to bear.

Senator VITTER. Thank you. Senator Jeffords.

Senator JEFFORDS. I would like Mr. Faber and Mr. Curole to comment on the interaction between natural features and man-made features as part of a comprehensive flood control plan. What role do natural features such as wetlands and barrier islands play?

Mr. CUROLE. It's a very important, critical point. I have been dealing with actually wetlands issues since about 1975 and levee issues since 1980. It was always a battle to get people involved in wetlands issues, all the way until about the 1990's. I found it surprising that we have gotten to the point right now where a lot of people interpret wetlands restoration in the place of hurricane protection. We have statistics showing that there is no doubt having wetlands projects helping out in reducing storm surge.

But there is, I have been told by the National Hurricane Center, some of their modelers over there, they believe when you are talking about a powerful hurricane, marsh elevations will not make a big difference. Now, what is different when we are talking about the natural terrain in south Louisiana, we always had not only marshes, but we had ridges, chenieres, we call them, ridges that would develop higher areas.

We have right now, with all the negative things, a delta being constructed south of Morgan City, Louisiana, because we have 30 percent of the Mississippi River going into shallow water. The flood elevations we saw in Morgan City were a lot lower than on either side of Morgan City, even though Rita was to the west of Morgan City. But you have not just marshes being built, you have this shoaling area where you get elevations of four to five feet.

So basically they do work together. On the everyday issue, we have, our levee district has built marsh, we call them marsh aprons, alongside of our levee that can reduce the effects of everyday wave action in causing erosion along our levees. So they do work together.

But we absolutely need levees to protect where we live. We also have a subsidence issue that even with all the restoration our communities are still going to have less elevation. So the levees are definitely needed. Any restoration we do will help the effects and the performance of those levees.

Senator JEFFORDS. Mr. Faber.

Mr. FABER. I would agree with Mr. Curole. There is obviously a combination of structural protection enhancing existing levees, building new levees, perhaps reevaluating other structural solutions that needs to be a part of this future picture. In addition, there needs to be a real commitment to implement the restoration plan for Louisiana's barrier islands and coastal wetlands as it has been developed by the State and by the corps of Engineers.

I think in both cases, both of these efforts have suffered from a critical lack of urgency. I think sadly the people in this room are among the few thousand who fully understood what would happen when a category 4 or category 5 storm would strike. Despite our best efforts, we were unable to really alert the Nation to the costs of our failure to act. Again, if we had really begun in earnest to address this issue 10 years ago or even 5 or 6 years ago when Governor Foster first kind of really put this on the Nation's radar screen, we would be in a much better position to prepare for the next hurricane.

Mr. CUROLE. One other thing about structures, we talked about the Barrier Plan across Lake Pontchartrain, that barrier that was objected to by the locals. Since I have been working with the Levee Board Association on comprehensive hurricane protection, we have involved the foremost environmental group in the Lake Pontchartrain Basin, and they now support a barrier across. Of course, done in a way that the flow of water stays at a normal pace until you have to close for hurricanes. So there has been good cooperation over the years and more trust between, let's say the Corps of Engineers and some of the environmental groups. So there is progress in making those things work together better.

Mr. FABER. I will just add, another critical piece that is missing right now, one is obviously the funding to quickly repair levees, to begin coastal restoration. But another critical piece that is missing is the funding necessary to relocate vulnerable, frequently flooded homes and businesses where that is the choice of a homeowner or business owner.

There have been some changes in the Stafford Act since the great flood of 1993 that are making it significantly harder for parishes and for State officials to relocate people who want to get out of harm's way and get to higher ground. In particular, there are owners' cost share requirements, we no longer set aside 15 percent of all disaster relief to help move or elevate structures so that they are better positioned when the next hurricane strikes.

So there are things that the Congress can do right now to amend the Stafford Act to make the voluntary relocation of some of these structures that in retrospect should not have been built in these certain places to make that relocation possible.

Senator JEFFORDS. Mr. Brink, you mentioned the role of historic preservation in economic recovery. My colleagues from Louisiana recognize this, and they have proposed $150 million in grants for historic preservation in Louisiana, with $25 million earmarked for your organization.

Can you expand on how these resources could be used to drive economic development in low income communities?

Mr. BRINK. The idea of the request for preservation grant money, and thank you, Senator Vitter and also Senator Landrieu, for including that amount in your joint bill. Our request was more modest at $60 million that takes into account the authorization level of the historic preservation fund. We will be happy to have more.

These would be grants that we hope will tip the balance when a homeowner is making the decision as to whether the economics work for them to rehab as opposed to demolish. They would be available in the 20 National Historic district areas. They are not for the high style fancy house as much as they are for the middle income, more modest house.

We see the providing of overall character in the city as a key element of its ongoing heritage tourism attraction. The French Quarter, of course, is well known. But having that alone is not going to continue to draw the 10 million people a year that New Orleans previously drew. The real attraction of New Orleans beyond the French Quarter is food, jazz, the mix of people, the mix of architecture. It is a marvelous city, and it needs to be a living city, not a stage set that only has the French Quarter.

Senator JEFFORDS. Thank you.

Senator VITTER. Thank you. Senator Isakson.

Senator ISAKSON. Mr. Faber, your independent commission to develop a comprehensive plan to quickly assure businesses and folks that restoration will take place quickly and competently implies a couple of things. But the first thing that it implies is that they would actually have the authority to expend the money.

Mr. FABER. That's right.

Senator ISAKSON. Let me ask you a question, then, if that is right, what is it about the way that we set our civic works priorities and the way OMB and the Congress function that you find faulty?

Mr. FABER. Any member or Senator, I am sure, shares the frustration with the pace at which we design, plan and construct flood control and restoration projects. This is an extraordinary circumstance. It seems to me that we need to find a new way to make the resources available to prepare for the next hurricane, which could be as soon as next June.

What we would propose is to have a commission of three national experts with a staff taken from the Federal Government, from various Federal agencies, including the corps and other agencies, but that would also have the power to reach into the private sector to get the best minds from our engineering firms, to reach into our universities to get the best minds from our institutions of higher learning. Put the best minds to work right away so that we can devise a comprehensive plan that addresses the needs of structural infrastructure, that addresses the need of lost barrier islands and wetlands.

I have only positive things to say about the great work of the Army Corps of Engineers. I think they would admit that they simply lack the resources and the capability to meet this particular task. This is a task that we are undertaking that has been like no other in the history of this Agency. It is inconceivable that the number of people who are sitting today in the New Orleans district or in Vicksburg or in Memphis or even here in Washington on their own could solve this problem.

I am not proposing to replace the corps, but I am proposing that we supplement their expertise and their capacity with others within the private sector and the universities to get this job done as quickly as humanly possible.

Senator ISAKSON. Again, that does beg the question that you appropriate a lump sum of money and then tell them to spend it, is that correct?

Mr. FABER. That's exactly right. In our view, if it were Presidentially appointed and they were people of national reputation and integrity, that would I hope provide the assurances that you and others would want that this money would be wisely spent.

Senator ISAKSON. Mr. Ellis, what would your organization think about that?

Mr. ELLIS. We would have concerns about a large lump sum appropriation for this. I think that you could have some controls over the process with congressional check-in and Administration check-in. I think that as some have envisioned, that having a large fund

that has been removed from congressional appropriations control, from the Administration's control is of concern to our organization.

That is not to say that the idea of having some body that drives this process, that elevates its level of attention in Congress and in the Administration's eyes it not worthwhile. I think that makes a lot of sense, there is precedent in our history. President Coolidge tapped Secretary of Commerce Hoover to lead the effort after the flood of 1927. I think that is an interesting model at least to try and elevate the process so that it is somebody that the President pays attention to and that Congress pays attention to.

Senator ISAKSON. My last thing is more of a comment than a question. Mayor Nagin was here a week ago and I brought this up to him. I don't believe I heard any of you reference the local parish Government or the city Government. There was an oblique reference to the Governor.

One of the important things in how we restore is going to be what the future land use recommendations are of the local Governments. I am going to keep saying this, David, because I really commend you on what you have done, but there are so many things you can do in the future planning for New Orleans and the other coastal parishes and Mississippi that would directly impact the way in which the corps or any independent commission or any czar would redo the infrastructure.

This is not a chicken or egg question. The first thing is the people of New Orleans and those parishes are going to have to decide on what it is they want New Orleans and that area to look like understanding what can happen when a category 3 or 4 storm hits with the infrastructure they had.

I was a developer for years in the real estate business and I get very—I know the levee man is nodding his head down there—frustrated when everybody talks about independent commissions and quickly responding. I never hear anything about what local decisions are being made on the future redevelopment that would lessen the impact of flooding if it ever happened in a natural disaster. So that's a statement, not a question, but I just had to say that.

Mr. ELLIS. In our written testimony, I address this issue. I agree. All these decisions about local redevelopment need to be local decisions. I completely agree.

Senator ISAKSON. They need to be the first decisions.

Mr. ELLIS. Absolutely. I completely agree. I think we need to give those local decisionmakers a real choice where there are homes that are under 20 feet of water that may not be rebuilt or might be relocated or elevated. We are not giving them the resources to make those decisions today.

I think the important thing is how do we integrate, who can integrate. I don't think today we have created a body that can integrate those local judgments with the broader judgments about where to build levees, where to raise levees, where to build new infrastructure, where to restore wetlands, where to build diversions to restore wetlands.

That is a big puzzle that no single Agency that is sort of sitting in this picture today can really pull together. I think that is the problem we are trying to solve.

Senator ISAKSON. My time is up, but I have to say one thing, and this addresses the historic preservation and the levees and everything else. This is a terrible tragedy. Lives were lost, fortunes were lost, money was lost, a lot of things like that.

But if there is a silver lining, with the amount of money that is going to be invested, if there is a quality, comprehensive plan, the new New Orleans and the new coast can be greater than the old New Orleans and the old coast. People are going to come back if they have a belief that the problems that were borne out by this storm in fact have been corrected for the future redevelopment of the city.

Senator VITTER. Thank you, Senator. Senator Thune.

Senator THUNE. Thank you, Mr. Chairman. I want to congratulate you for holding this hearing and also for the exceptional leadership that you have provided in light of what was an unprecedented and devastating tragedy in your State and for the light that you have shed and the direction that you have provided to us as a Congress and steps that we need to be taking to respond.

I agree with the Senator from Louisiana that more needs to be done in New Orleans. I understand that investigations and reviews are underway concerning the levee breaches. I support an expedited process for the water resource needs in Louisiana. The question I think that I have and that we need to answer is to ensure that we have a full understanding of what went wrong before the hard construction begins. I am curious to know if there is a priority ranking of projects so that we can ensure that critical projects in New Orleans can begin without waiting for a full analysis of other projects in the region. Does anybody know if those sorts of things have been established?

Mr. FABER. the corps has, and I am sure if General Riley was still here, or the Assistant Secretary could address it. the corps has a list of priorities for which levees they are going to repair first. They are trying to repair all these levees with great urgency. So that is underway.

I think, and people may disagree about this, but it strikes me that there certainly or apparently were design flaws with some of the levees. Getting to the bottom of that should not get in the way of immediately devising a comprehensive plan to provide a higher level of protection.

Those design flaws, at least according to the ASCE preliminary report that you have seen and your staff have seen seem isolated in terms of the materials that were used, the assessment of those sites, the designs of those particular levees. These are not problems associated with the footprint on which you would build a better levee system or potentially a tidal barrier or build more wetlands and barrier islands.

I don't think we need to wait 8 months to devise a plan. I don't think we need to wait 1 month to begin to raise some levees, to begin to restore some wetlands, to begin to relocate some vulnerable homes. It terrifies me, I sense your frustration, Senator Vitter, that we are going to wait that long to really begin this effort in earnest.

Mr. CUROLE. If I could make one comment, the focus, if we don't do it while the focus is here, we will lose it. Betsy hit 40 years ago

September 9th. Some of these levees were authorized that year and were not completed. If we lose focus, if we do not move quickly and at least get the plan set and then try to get some type of funding, right now the major press have forgotten. They are Katrina tired. Soon this will happen here. If we do not set it right, we are setting ourselves up for more problems.

I am optimistic that New Orleans and the Gulf region can be much better than it was. It takes very hard decisions here in Washington but also in Baton Rouge and MS. I am trying to work both ends, I am missing a couple of meetings right now. It is critical, but it is a great opportunity. New Orleans can be the hottest little city in the United States if it is all done correctly. There is some optimism on that.

Senator THUNE. I think, and many of us share the frustration that Senator Vitter has articulated in how things are moving and the concerns about are we doing the things we can do now. Obviously knowing full well that there are issues that need to be studied so that we do this right. I think that is a concern that taxpayer groups and others have voiced and clearly a concern to a lot of us as well.

I want to come back to the discussion that was being held earlier here with respect to the independent commission within the Office of the Secretary of the Army that you all have suggested. It seems to me at least that there is already, you have this what would appear to be an ideally situated commission called the Mississippi River Commission that could lead the comprehensive plan. Clearly, navigation, flood control programs on the river will have to be coordinated with both hurricane protection and coastal restoration.

I guess the question is, why would we want to create another layer of Government do to what that commission can and should be doing? They have a century-long record of outstanding service to the Nation. Would you comment on that?

Mr. FABER. It is an excellent question. I think there are two reasons that the Mississippi River Commission is the wrong body.

One is that the membership of the Mississippi River Commission does not include engineers, hydrologists, scientists of great national reputation and great national integrity. I don't think the MRC would provide the level of accountability, quite frankly, that you would want, that other Members of Congress would want if you are going to provide significant resources to help with this effort to and increase flood protection.

The second reason is that the Mississippi River Commission has a very different role. Among the roles that the MRC plays is they decide what to do in the event of a major flood on the Mississippi River. They are actively involved in the day to day management of the Mississippi River.

The commission we envision would not exist forever. It would be a commission that would be term limited or time limited, that would have a specific job, which is to figure out how it is we provide a category 5 level of protection to this major urban center and to help begin the execution of that plan. I don't imagine this is a body that exists 75 or 100 years from now and is intimately involved in the management of all these decisions.

Mr. ELLIS. The only other thing I would add on the Mississippi River Commission, some concerns that I would have, the president of the Mississippi River Commission is the division commander of the Mississippi Valley Division. The only other Federal Agency that is represented on it is NOAA, the National Oceanographic and Atmospheric Administration.

So if it was to be the body, it would have to be broader, and I would think that you would want to bring in, you would want to have a separate head than just having it driven by the corps. I think decisions about redeveloping in this area are broader than the corps.

Obviously, flood damage reduction, storm damage reduction is a major focus and it is probably the primary focus initially. But all the other economic development incentives and activities are going to have to be a key part of it.

Last, I think that it should have a recognizable titular head that is at the point of this activity that is the person that can communicate with the President. I think elevating it out of the Department of Homeland Security or DOD is key to really having the attention on the whole Gulf Coast region in this initiative.

Mr. CUROLE. I think it is critical that we have some body, some entity that is going to work just as hard when the sun is shining as when there is a threat. That is the problem. We lose focus. Things get in the way, everyday business, from the local Government to State Government to the Federal Government. Other business, health care, other things get in the way. You need to have someone that can at least tap into the power structure to say, look, we need to get this done because it happened to us, it happened to us again.

New Orleans in 1915 flooded, 1947, 1965, there was nothing to say that New Orleans wasn't going to flood again. Yet I guarantee you, we were fighting hard to keep that focus. The risk was there and it was a difficult battle. I guess you could say we lost.

Mr. FABER. I don't think anyone is proposing that the corps would not be the central player in the design and execution of this comprehensive plan. the corps controls this infrastructure, they have jurisdiction over the infrastructure, they have the expertise. All we are suggesting is that there is other expertise and other capability that resides outside the corps, and that we need someone to pull all of these pieces together.

That is not the role of the Secretary of the Army. There needs to be somebody of national reputation who is thinking about this 24 hours a day and is making sure that this plan is implemented before disaster strikes again.

Senator THUNE. I appreciate that. My understanding was that the Mississippi River Commission is very specialized and does have many of the noted experts in the field of water resource protection, including engineers. I also understand the importance of having someone that is very focused on the issue at hand.

Thank you, Mr. Chairman.

Senator VITTER. Thank you, Senator. If I can just participate in the discussion and wrap it up. I would agree with some of our panelists, I have concerns that the Mississippi River Commission is not the precise right group of persons to do this. But I think it is an

extremely important model and precedent. Because basically, it is what Congress created after the 1927 flood.

Senator THUNE. I agree.

Senator VITTER. Huge flood, huge national event, not just in Louisiana, all up and down the river, catastrophic losses. Congress created this commission and said, look, make sure this never happens again. Make sure you come up with a plan and get it done in a streamlined way so this sort of loss never happens again.

They created the commission and basically it has never happened again in that way. So in a very general sense but important sense, I think it is a precedent and a model that we need to follow in the same way, so that we put together a body with the corps at the center but with other folks involved and tell them, make sure this never happens again, give us a comprehensive, integrated plan. Do it on a streamlined basis so this $100 billion event never happens again.

I would also point out, there has been a lot of discussion about priorities of Corps projects, for instance, and well, money shouldn't have been spent here, it should have been spent on the levee system. Some of that may be true. But I also point out, all of the major breaches that caused the flooding in the city were to elements of the levee system that were complete. It wasn't ongoing construction. It was done. It was clearly inadequate and/or flawed design. It is not as if we are waiting on money to finish that project. It was done.

By the way, there are other parts of south Louisiana which aren't done. We were just lucky that the storm didn't go there. So there are plenty of other places that aren't protected even on paper to category 3.

Mr. FABER. I think that is an excellent point. It is probably worth noting that, I think the Congress in 1999 asked the corps to figure out, how do we provide a category 5 level of protection for New Orleans. To my knowledge, we haven't begun that study. So I think you are right, we have made some wise investments, but there are obviously some priorities, this would seem to be a significant priority that is just being put behind the stove.

Mr. CUROLE. In fact, the study was hurricane protection in Louisiana, and it has been sorely under-funded. You look at authorization for Morganza to the Gulf. In our area, just to the side of Terrebonne Parish, we had zero flooding inside the system, two storms, zero flooding. They were subject to the same water elevations, they had 10,000 homes flooded.

Senator VITTER. As I noted to Mr. Ellis, all the activity we have done so far and the dollars appropriated, none of that has gone to constructing anything beyond the present system.

However, at least with regard to designing it, the study you are talking about, and getting a full design for a higher category 5 system, I am very hopeful that before we leave this year, that is going to be fully funded.

Mr. ELLIS. Mr. Chairman, I would just say that the issue on priorities goes beyond Louisiana, it goes beyond Katrina in that we have to, our opinion is that the lack of priorities within the Corps of Engineers budget that enables this type of process. It means that money that should be going potentially to provide flood protec-

tion and storm damage protection in Louisiana isn't going there because it is going somewhere else in the Country to a lower priority project.

If we don't establish some sort of system of priorities, we are going to have the exact same problem in other parts of the Country. I think the biggest thing that is incumbent on all of us, and particularly Congress and the Federal agencies, is to learn from this disaster so it doesn't repeat, not only in New Orleans and Louisiana, but it doesn't repeat in other places around the Country. Shame on us if we don't put in place those processes.

Senator VITTER. Great. Do we have any wrap-up questions from Senator Jeffords or Senator Thune?

Senator JEFFORDS. No.

Senator VITTER. In that case, we want to thank our second panel and thank all of our participants today. The hearing is adjourned.

[Whereupon, at 11:47 a.m., the committee was adjourned.

STATEMENT OF HON. TOM CARPER, U.S. SENATOR FROM THE STATE OF DELAWARE

I am pleased that the committee has called this hearing. It is time to start applying what we know went wrong during Hurricane Katrina to the development of a rebuilding plan. We also need to explore the implications of the failures in New Orleans on the state of other flood control systems across the Nation.

In previous hearings with the Corps of Engineers, we have been told that it was unclear whether the levees failed to perform as designed or if they were overwhelmed. In other words, we didn't know if the levees get overwhelmed by a storm that was larger than they were designed to withstand—or if they simply failed.

Last week, at a hearing of the Homeland Security and Government Affairs Committee, we were told that they simply failed.

Representatives of the teams researching the floodwall breaches—including experts from Louisiana State University, the National Science Foundation and the American Society of Civil Engineers—informed us that the storm surge and winds that Hurricane Katrina brought to the Lakefront area of New Orleans were that of a category 1 hurricane. Though the levees and floodwalls were designed to handle a category 3 storm, many of the floodwalls failed.

Numerous factors seem to have contributed to these failures. This includes the differing floodwall heights and construction materials used in different parishes (controlled by different levee boards). It also appears that floodwalls were anchored into weak ground and not deep enough.

Clearly, we need to take a look at the way the corps determines the appropriate design for floodwalls. We also must review how the corps prioritizes projects and conducts their cost-benefit analysis.

Moreover, we need to know the impact of dividing the responsibility for maintaining levees and floodwalls within one flood control project between various local levee boards.

From a broader perspective, we must review other flood control projects across the region—and the Nation—to ensure that the same problems did not occur elsewhere and that we have the flood protection we expect.

Some responsibility may lie in the way Congress and the Administration authorizes and funds flood control projects. If so, changes will need to be made there as well.

While I know we must spend a little longer looking at the failures that occurred in New Orleans during Hurricane Katrina, I look forward to moving into a more proactive mode. Identifying the changes is essential if we are to avoid this kind of failure in the future in New Orleans or any place else in the country.

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STATEMENT OF HON. HILLARY RODHAM CLINTON, U.S. SENATOR FROM THE STATE OF NEW YORK

Thank you, Mr. Chairman. I appreciate you holding this hearing, as well as the stakeholder meeting that preceded it.

It is critical that this committee be both expeditious and thoughtful in its approach to these critical issues.

I think this hearing is a key step in that process, and I commend you for holding it.

I want to say at the outset that I hope we don't waste any time on the mistaken point that some have made, in trying to blame environmentalists for the failure of the levee system.

I think that since that charge was initially raised, it has been thoroughly rebutted. I ask consent that a report prepared by the Center for Progressive Reform be entered into the record. The report does an excellent job of telling the full story about why design changes were made in the 1970s, and truth is that a suit by fisherman and environmental groups one small factor of many.

Though blaming environmentalists misses the mark, it does attempt to answer one of the critical questions: why did the levees fail?

Until we have an ironclad answer to this question, any solution that we propose runs the risk of simply creating new failures.

So coming to a firm understanding of what went wrong is one critical, if obvious, step that we need to take.

I know that the corps is currently analyzing what went wrong, and this work will be reviewed by the National Academy of Sciences as well as a team from the American Society of Civil Engineers.

I have called for a Katrina Commission to comprehensively analyze what went wrong, because I think it is desperately needed.

But I am pleased that at least in this case of the levee failures, there are outside experts who will be involved.

As for today's hearing, and the path forward for the committee, it seems that there is some degree of consensus on principles that should guide us.

First, we need a comprehensive approach that considers flood control, ecosystem restoration, and navigation. This approach needs to consider the role of coastal wetlands in flood protection, something that our witnesses will discuss today.

Second, local redevelopment decisions must by integrated into any Federal plans, and those decisions should be based on broad input from residents.

How we answer these questions with respect to flood control and other activities within in the jurisdiction of this committee needs to be linked to broader discussions about how we guide recovery efforts in the Gulf.

Mayor Nagin was here last week. He and Governor Blanco both have commissions that are looking at how to rebuild. The President has recently asked FDIC Chairman Donald Powell to head Federal recovery efforts down there.

I look to Senator Landrieu and others for their ideas about how best to try to integrate local, State and Federal recovery decisions.

But in terms of flood control and the other issues under this committee's jurisdiction, I think it is important that we seek to provide immediate protection in advance of next year's hurricane season.

At the same time, we cannot rush to a solution which—like the one in place on August 24—is doomed to fail when the next huge storm makes landfall near New Orleans.

Thank you, Mr. Chairman. I look forward to the testimony of our witnesses.

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STATEMENT OF GEORGE DUNLOP, PRINCIPAL DEPUTY ASSISTANT SECRETARY, CIVIL WORKS, U.S. ARMY

Mr. Chairman and members of the committee, I am George Dunlop, Principal Deputy Assistant Secretary of the Army for Civil Works. I am pleased to appear today with Major General Don Riley, Director of Civil Works, to discuss the role of the Department of the Army and the U.S. Army Corps of Engineers in the recovery and rebuilding efforts that lie ahead for the Gulf Coast.

The Administration stands ready to work with local and State officials as they plan for the future of New Orleans, parishes in southern Louisiana, MS and other parts of the Gulf Coast. As we know, New Orleans has a particular challenge because much of the city lies below sea level. Thorough analysis, much thoughtful consideration of alternatives and careful attention as to how to best integrate future flood and storm damage reduction objectives with one another and with the effort to address the needs of the coastal wetlands ecosystem will guide future consideration and decision making, to be sure. The Corps of Engineers will work with the State, City, and Parish officials to design and build a flood and storm damage reduction system that is better than before the storm; and these local officials will have a large part in the engineering decisions to come.

CORPS ROLE IN CURRENT FEDERAL EFFORTS

The Corps of Engineers, in collaboration with FEMA, will be an integral member of the close Federal partnership with the States of Louisiana and Mississippi, the city of New Orleans, and other Gulf Coast cities, parishes, and counties. the corps stands ready to provide advice to assist their recovery and rebuilding in a way that provides full consideration of all relevant factors.

Federal funds are being made available to help cover the costs of repairing public infrastructure in the disaster zones, from roads and bridges to schools and water systems. If called upon, the Corps of Engineers stands ready to execute a broad array of engineering, construction and contract management services.

The President has established, by Executive Order, the Gulf Coast Recovery and Rebuilding Council to further strengthen Federal support for the recovery and rebuilding effort through effective, integrated, and fiscally responsible support from across the Federal Government to State, local, and tribal Governments, the private sector, and faith-based and other community humanitarian relief organizations.

Beyond immediate recovery tasks such as removing debris and providing utilities and "blue roofs" for homes and businesses, the corps is currently working on repairs to the storm damage reduction system that was in place in the city of New Orleans and other parts of the storm-affected area before the storm. Essentially, the corps is repairing existing levees and floodwalls before the onset of the next hurricane season to reduce the risk of damage in a future storm.

FORENSIC ANALYSIS

the corps is actively engaged in assessing the performance of the storm damage reduction projects that were in place at the time of the Katrina and Rita storm events. We will use these findings to ensure that repairs to existing features in the New Orleans area are technically sound, will have efficacy, and are accomplished in a way that is environmentally sustainable. Lessons learned will be integrated on an ongoing basis into the design, engineering and repair of these features, which is already underway.

Indeed, the corps is already hard at work in this regard, having established an Interagency Performance Evaluation Task Force (IPET) to collect and assess information that can inform decisions to repair existing authorized structures. Also, an independent team from the American Society of Civil Engineers (ASCE) is already collecting information to apply to the development of design criteria for these features. Other organizations and individuals are doing important work in this regard, as well. To the extent practicable, all relevant data will be carefully considered and objectively assessed.

In addition, the Secretary of Defense has directed the Secretary of the Army to convene a panel of experts under the auspices of the National Academies to evaluate the information collected by the IPET and other parties so as to provide an independent and peer reviewed assessment of the performance of the storm damage reduction system in New Orleans and the surrounding areas.

The National Academies will assemble an independent multidisciplinary panel of acknowledged national and international experts from the public and private sectors and academia. This National Academies panel is to be drawn from the membership of the National Academy of Sciences and the National Academy of Engineering. The panel will issue a final set of findings based primarily on the forensic data gathered by the Interagency Performance Evaluation Task Force and the American Society of Civil Engineers Independent Review Panel, and will draw upon information and assessments provided by other sources.

The National Academies will report directly to the Assistant Secretary of the Army (Civil Works). The study is expected to take approximately eight months to complete. All reports generated by these panels will be made available to Congress and to the public.

Following the forensic analysis, we will need to evaluate a broad range of options before developing recommendations as to the best ways to reduce the risk of future storm damages for the City of New Orleans and surrounding parishes.

COASTAL ECOSYSTEM RESTORATION

The Administration has also recommended the reallocation of $250 million of the Emergency Supplemental funds already provided by Congress to fund activities related to the restoration of natural coastal features that will help reduce the risk of storm damage in the greater New Orleans metropolitan area. Specifically, barrier islands and coastal marshes can provide a natural buffer against some storm

surges, and thus serve as the foundation upon which projects to reduce the risk of storm damage to the urban areas of the coast are constructed.

The Administration is working with Congress and the State of Louisiana to develop an appropriate, generic authorization for the Louisiana Coastal Area Ecosystem Protection and Restoration Program that will expedite the approval process for projects and their implementation while providing greater flexibility in setting future priorities and increased opportunities for application of adaptive management decision making. Such an integrated, programmatic approach to coastal wetlands protection and restoration is essential for program efficiency and efficacy.

SUPPORT TO NAVIGATION

Finally, I mention with pride the great work that the corps has done to restore waterways in the region to navigable condition. Although much work is ongoing, particularly dredging and repairs to locks and bridges, most of the Gulf Coast's waterways have already resumed normal operations.

CONCLUSION

Mr. Chairman, this concludes my statement. I look forward to working with you and the Ranking member and other committee members on matters of mutual interest and concern. Following Major General Riley's statement, I would be pleased to answer any questions you or the other committee members may have.

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RESPONSES OF GEORGE DUNLOP TO ADDITIONAL QUESTIONS FROM SENATOR JEFFORDS

*Question 1.* Mr. Dunlop, during the stakeholders meeting we held in this committee, and during last week's hearing with Mayor Nagin, one of the major points was that local redevelopment plans must drive Federal investments. For example, it may be possible to redevelop the city in such a manner that the highest levels of flood control are not required everywhere. The Mayor and the Governor both have planning processes underway. I realize that time is of the essence in rebuilding, but you don't want to spend huge amounts of resources rebuilding flood control in an area where no one is going to live. How is the corps participating in the local process to set up a redevelopment plan, and are you coordinating your decisions regarding repair of the existing projects with these groups?

Response. As MG Riley stated in his response, the corps is repairing the damaged hurricane protection system to provide the level of protection authorized by Congress prior to Katrina, as has been directed by Congress and supported by the Administration. the corps is coordinating the repair of the existing system with local and State officials, thereby enabling public interest and business investment decisions to be made. Corps of Engineer employees is assigned as liaisons with both the City of New Orleans and the State—Louisiana Recovery Authority to ensure full communication and awareness in the planning efforts. We have met with representatives of the New Orleans business community and are participating in local planning meetings when we are invited to do so.

*Question 2.* On November 9, 2005, the NAS released a report on the coastal Louisiana restoration plan. One of its major recommendations echoes themes we have heard about local redevelopment plans—they recommend the development of an explicit map of the expected future landscape of coastal Louisiana. Without this, it will be difficult to move forward with coastal restoration and flood control in a targeted manner. Can you give me your response to this recommendation and your thoughts on how it should be implemented in Louisiana?

Response. the corps' traditional approach to water resources planning was designed to facilitate problem solving and decision making for specific sites and projects. Today, the corps is being asked to use its planning capability to facilitate, convene, advise, and work collaboratively with other Federal and State programs in developing solutions and integrating programs, policies, and projects across public agencies. Collaboration is the keystone of the corps watershed approach. Collaborative planning includes Corps participation as a team member in other Federal, State, or local agencies planning activities where there may be no expectation of construction or other work by the corps as a result. By bringing together the expertise and programs of all the appropriate Federal agencies, collaborative planning will solve problems at the proper scale, integrate solutions across purposes and business programs, and leverage Federal and other funds. Monitoring and adaptive management are an essential component of such planning. Adaptive management takes into account the uncertainties that exist regarding decisions and allows the decision making and implementation process to proceed with the understanding

that progress will be assessed and evaluated and that some structural or operational changes may be necessary to achieve the desired results. As an example, the Administration is working with Congress and the State of Louisiana to develop an appropriate, generic authorization for the Louisiana Coastal Area Ecosystem Protection and Restoration Program that will expedite the approval process for projects and their implementation while providing greater flexibility in setting future priorities and increased opportunities for application of adaptive management decision making. Such an integrated, programmatic approach to coastal wetlands protection and restoration is essential for program efficiency and efficacy.

*Question 3.* One of the key themes we have heard is that cost-benefit analysis procedures should be revised—most significantly to account for potential loss of life. What are your views on the revision or abandonment of cost-benefit analysis as a decision-making tool for the corps?

Response. The cost-benefit analysis is still an effective decision making tool for the corps, but it is the use of the tool that must be monitored and periodically adapted to changing socio-economic conditions. the corps has recently released guidance on planning in a collaborative environment which reflects improvements to the corps' approach to water resources planning. It is designed to facilitate problem solving and decision making for specific projects as well as a more collaborative and systems-based approach to working with other Federal and State agencies in developing solutions that integrate programs, policies, and projects across public agencies. All Corps planning studies will evaluate, display, and compare the full range of alternative plans' effects across four accounts (National Economic Development (NED), Environmental Quality (EQ), Regional Economic Development (RED) and Other Social Effects (OSE)). NED account shows effects on the national economy. The EQ account shows effects on ecological, cultural, and aesthetic attributes of significant natural and cultural resources that cannot be measured in monetary terms. The RED account shows the regional incidence of NED effects, income transfers, and employment effects. The OSE account shows urban and community impacts and effects on life, health and safety. The discussion and display of benefits will address each of the four accounts and will not be limited to one account. For example, evaluation of inland navigation improvements should not only address effects on transportation savings but also security, safety and environmental advantages or disadvantages with respect to other modes of transport. After considering a plan's beneficial and adverse effects across all four accounts, the plan may be a candidate for selection if it has, on balance, net beneficial effects.

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## STATEMENT OF MAJOR GENERAL DON T. RILEY, DIRECTOR OF CIVIL WORKS U.S. ARMY CORPS OF ENGINEERS

### INTRODUCTION

Mr. Chairman and distinguished members of the committee, I am Major General Don T. Riley, Director of Civil Works. I am honored to be testifying before your committee today, along with the Principal Deputy Assistant Secretary of the Army Mr. George Dunlop on the involvement of the Corps of Engineers in the Federal recovery and rebuilding effort for New Orleans and the surrounding areas. My testimony today will provide a brief status of our activities in the storm impacted area, and describe how the Corps of Engineers can assist in this effort.

### EMERGENCY RESPONSE SUPPORT TO FEMA

We are continuing to execute the corps FEMA-related missions of debris management and roofing in the impacted area. Through October, we had removed over 14 million cubic yards of debris from areas of Louisiana, Mississippi, and Alabama impacted by Hurricane Katrina. We have installed nearly 107,000 temporary roofs. the corps has completed over 200 temporary public structures in Mississippi, including police and fire stations, city halls, post offices and other governmental buildings. Corps employees are also putting children back in classrooms throughout Mississippi, helping to bring towns back to a bit of normalcy.

### REPAIRS TO THE EXISTING SYSTEM

With our contractors, we are working around the clock on the repair of levees and floodwalls to reduce the risk of damage through the remainder of this hurricane season, which continues until the end of November, and the rainy season that the city normally experiences in December and January. Our goal is to complete this phase of the effort before the start of the next hurricane season, which begins in June

2006. Twenty-eight contracts have been, or currently are, advertised (13) or awarded (15), with an estimated value of approximately $175 million. Any delays in contract awards could impact our ability to complete work by June 2006. We are also actively gathering data and information to learn from the recent storms, and have begun an after action assessment of the existing storm damage reduction system.

INVESTIGATING THE PERFORMANCE OF THE EXISTING SYSTEM

There is no single answer to the questions as to why there were failures in the storm damage reduction system as there were multiple breaches of levees and floodwalls at a number of locations. We have not yet determined the failure mechanism or mechanisms, which are likely to vary in each case. The answer to these questions will follow from a further investigation and thorough analysis of the data we are now collecting. In some cases, e.g. the Inner Harbor Navigation Canal, we have observed evidence of overtopping that may have played a role. In other cases, e.g. the 17th Street Canal, we have observed evidence of massive soil movement that could have been a factor in how these levees failed. There is a need for considerable analysis to answer this question.

The Chief of Engineers has commissioned an Interagency Performance Evaluation Task Force (IPET) to perform the engineering evaluation. The IPET includes engineers and scientists from the Engineering Research and Development Center from Vicksburg, MS, as well as from other Federal agencies, such as the Bureau of Reclamation and the National Oceanic and Atmospheric Administration. The data collection teams have been performing field work in the New Orleans area to obtain as much data as possible related to the performance of the levees and floodwalls and to ensure that data is collected before it is covered over or lost by cleanup or as a result of repair efforts. Over the next eight months, the IPET will examine and analyze the data and rationally test various hypotheses about the behavior of the infrastructure. The IPET will use collected data, laboratory testing, and modeling activities in its analysis. The work currently planned includes assessing the Geodetic Reference Datum; performing storm surge and wave modeling and interior drainage/flooding modeling; evaluating hydrodynamic forces, floodwall and levee performance, and pumping station performance; and conducting a consequence analysis and a risk and reliability assessment.

Until we can compare the evidence to an understanding of the hydrodynamic environment that resulted from the storm, the forces generated by the resulting surge and waves, how those forces were applied to individual structures and how the structures, given their design intent and capacities, should respond to those forces, we will only be speculating as to why they failed. Nevertheless, I want to emphasize that we will not wait until the study is complete to begin applying what we are learning. As we learn, we will immediately act to incorporate those findings into the ongoing work in which we are engaged.

The American Society of Civil Engineers (ASCE) is supporting our efforts with an External Review Panel, which will provide an independent oversight of the IPET evaluation. The final IPET report will be released in June 2006. However, any important findings will be shared on an ongoing basis before then with those who are involved in the design, engineering, and repair of the existing New Orleans levees and floodwalls.

We are making all findings available to the public and invite the public and the scientific and engineering community to share any information they may have. On October 29th, the corps began publicly releasing available data by posting it on a publicly accessible website, https://ipet.wes.army.mil. Additional data will be added to the website as it becomes available. The IPET is collecting pre-Katrina documentation (design and construction drawings, soil sample records, etc.), post-Katrina documentation (hydrographic surveys, soil samples, concrete cores, etc.) and other performance data (eyewitness accounts, photographs, etc.). The data being released will include design memorandums dating back to the 1960s, and the associated reports for the Lake Pontchartrain, Louisiana and Vicinity High Level Plan, which includes 17th Street Outfall Canal and London Avenue Outfall Canal. This information includes the project plan, hydrology and hydraulics, geology, foundation investigation and design (including the field exploration, soil borings, and laboratory testing) and the structural design.

In addition to the IPET effort, the Secretary of Defense has directed the Secretary of the Army to convene an independent panel of national experts under the direction of the National Academies to evaluate the performance of the storm damage reduction system in New Orleans and the surrounding areas. The National Academies will assemble a multidisciplinary (e.g., engineering, atmospheric sciences, etc.) panel drawn from the public and private sectors and academia. The National Academies

Panel will perform a high-level review and issue findings and recommendations based primarily but not solely on the data gathered by the IPET and the ASCE Independent Review Panel. The findings of the National Academies Panel will be subject to a peer review process before being released under the imprimatur of the National Academies.

This forensic study is to focus on existing levees and/or floodwalls that were overtopped, breached, or failed during Hurricane Katrina, and whether such situations were the result of design, construction, or operation and maintenance issues, soil and geo-technical conditions, changed assumptions upon which the design or construction were based, the severity of Hurricane Katrina, or other factors. The National Academies Panel is expected to produce its final report by July 2006. All reports generated by these panels will be made available to the public.

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RESPONSES OF DON T. RILEY TO ADDITIONAL QUESTIONS FROM SENATOR JEFFORDS

*Question 1.* General Riley, can you articulate more extensively the parameters of the current levee inspection regime in this country, describe the role of the Corps of Engineers, and describe whether or not national standards exist for levee construction that will ensure performance?

Response. The Rehabilitation and Inspection Program, through P.L. 84-99, is the corps program that provides for inspections of flood control works (FCW), the rehabilitation of damaged FCW, and the rehabilitation of Federally authorized and constructed hurricane or shore protection projects (HSPP). FCW that are eligible for inclusion in the program include: Federally authorized and constructed HSPP's; Federally constructed, locally maintained levees and floodwalls; non-Federally constructed, locally maintained levees and floodwalls that provide a minimum of a 10-year level of protection with 2 feet of freeboard to an urban area, or a minimum of a 5-year level of protection with 1 foot of freeboard to an agricultural area; Federally constructed, locally maintained flood control channels; non-Federally constructed, locally maintained flood control channels that provide a minimum of a 10-year level of protection. [NOTE: Interior drainage channels within the protected area of a levee system are not flood control channels.]; Pump stations integral to FCW; Federally constructed, locally maintained flood control dams; and non-Federally constructed, locally maintained flood control dams.

An initial eligibility inspection is used to establish the acceptable and minimum performance levels for non-Federal FCW to gain an Active status in the Program. The inspections are conducted by Corps technical staff experienced in FCW design, construction, maintenance, and damage investigations. Initial eligibility inspections are not conducted on Federal FCW's. Federal FCW's are considered to be in an Active status when the corps turns over the project to the public sponsor for operation and maintenance. Within two years of Active status, the first continuing eligibility inspection is conducted. Continuing eligibility inspections will normally be conducted biennially for non-Federal FCW. For sponsors of projects with historically good ratings, the district may extend the frequency of inspection to a triennial basis. The continuing eligibility inspections are conducted at least biennially for Federal FCW, unless Corps regulation permits a longer period. The inspection is used to verify that the FCW continues to meet minimum acceptable performance levels for the Program. The flood control levees in the New Orleans area are inspected by both the corps and the local levee district, together and independently. Corps inspections are conducted annually by the New Orleans District Engineer and his staff, and representatives of the State of Louisiana and the respective Levee Districts. The local levee districts patrol the system between the annual joint inspections. A joint Corps/Levee District/State inspection of the Orleans area was completed in June 2005. At present, national standards do not exist for levee construction.

*Question 2.* General Riley, in response to my question about notification regarding levee failure, you said the following:

*"During the flood, again the local levee boards will all be along a flood levee observing and protecting in communications. Of course, during a hurricane you can't do that, you have to evacuate. So in the case, in this particular case, in New Orleans, they had the local citizens that were there on the ground that they called into the State, I was in the State EOC, the local sheriff's department and the director of homeland security for the city called into the State."*

Does this mean that whenever a hurricane strikes an area such as New Orleans, which is dependent on hurricane protection and flood control provided by Corps of Engineers' levee systems, the corps depends on average citizens who are ordered to evacuate but choose not to, to notify the State police that the levee system has

failed? If this is not the case, can you explain again what system the corps has in place today to monitor levee integrity and provide notification to local officials and citizenry that a breach or failure has in fact occurred?

Response. Local authorities, not the Corps of Engineers, are responsible for monitoring the levees and their practice is to increase the level of this activity as tropical storms approach. We were not asked for assistance with this as Katrina drew near on Monday morning and respected their jurisdiction for this activity. Under the restricted mobility and communications following landfall, we did not credibly confirm any breach until Monday evening. Once we did, we immediately notified affected parties in accordance with established procedures.

*Question 3.* During the hearing, you also said, "so there was immediate notification that went out post-levee breach of the levee breaches that went out through the city, through that system that they had with the available communications that we had. So we were there, Corps, FEMA, Federal agencies right there in the State emergency operations center where some initial reports came in and immediate notification went back out." Who provided the "immediate notification"? Did that happen as planned? Through what means and to whom did the immediate notification go back out?" Was news media notified? Through what means did you intend the citizens who did not evacuate New Orleans to learn that the levees had failed? Did the corps inform the State and local agencies that a renewed evacuation order should be issued?

Response. Who provided the "immediate notification"? Once the corps confirmed a breach, we immediately notified local and State representatives in the State emergency operations center, which is responsible for the flow of information.

Did that happen as planned? Yes, but due to the restricted mobility and communications following landfall, we did not credibly confirm any breach until Monday evening, August 29th.

Through what means and to whom did the immediate notification go "back out"? The State emergency operations center was responsible for the flow of information.

Was news media notified? The State emergency operations center was responsible for the flow of information.

Through what means did you intend the citizens who did not evacuate New Orleans to learn that the levees had failed? Notification of State officials of flooding was provided immediately on confirmation of the compromises in the hurricane protection system. The notification of citizens is the responsibility of State and local Governments.

Did the corps inform the State and local agencies that a renewed evacuation order should be issued? Evacuation of citizens and issuance of evacuation orders are the responsibilities of the local jurisdictions, and by mid-afternoon Saturday, August 28th, officials in Plaquemines, St. Bernard, St. Charles, Lafourche, Terrebonne and Jefferson parishes had called for voluntary or mandatory evacuations. A voluntary evacuation was issued for New Orleans early Saturday evening and a mandatory evacuation was issued Sunday morning. Post event evacuation orders as a result of flooding and other consequences of the hurricane were also issued by local officials.

*Question 4.* Based on the answers to the above questions, and the experience of Hurricane Katrina, have the corps, the city, and the State developed a revised notification plan? If not, what is the timeline for doing so?

Response. Notification of State officials of flooding was provided immediately on confirmation of the compromises in the hurricane protection system. The notification of citizens referred to above is the responsibility of State and local Governments. The initial actions of prevention, mitigation, preparedness, and response and recovery operations are conducted by local Government. Per the State of Louisiana's 2005 Emergency Operations Plan, the Parish and Municipal Governments' Chief Executive has overall responsibility by law for the direction and control of emergency/disaster operations and is assisted by a Local Homeland Security and Emergency Preparedness Director. My understanding is that a revised emergency notification plan is under development by the State and will be available in about 1 month.

*Question 5.* Can you describe the notification plan you have in place at the Waterbury Dam in Vermont?

Response. The Waterbury Dam is a non-Federal project, and as such, the local authorities, not the Corps of Engineers, are responsible for monitoring the levees and for the notification plan.

*Question 6.* General Riley, there has been much discussion of the Mississippi River Gulf Outlet and the effect it had in magnifying the storm surge that reached New Orleans. There is very little traffic on this navigation channel, and many have urged that we close it immediately to prevent it from causing additional flooding

during another hurricane. Is the corps evaluating this option in the wake of Hurricane Katrina, and if so, what have you found?

Response. There are four ongoing efforts related to the Mississippi River Gulf Outlet (MRGO)—a re-evaluation of the MRGO navigation project, two efforts to address ecosystem restoration needs for the MRGO under the Louisiana Coastal Area (LCA) authority, and a storm surge analysis being conducted by an interagency performance taskforce commissioned by the Chief of Engineers. All but the storm surge analysis predated Katrina. Preliminary analysis of the flooding in St. Bernard and Orleans Parishes do not indicate that the existence of the MRGO caused flooding or the compromising of the hurricane protection system. The reevaluation study of the MRGO referenced above will be revised to consider the new information. A report will then be available for Congressional consideration as to the future of MRGO. Appropriate actions will be taken once Congressional consideration and direction has been provided. Meanwhile, additional initiatives are described below.

During FY 2005, the corps was preparing a reevaluation of the MRGO to determine whether there is an alternative to the present project that would be more beneficial to the nation. When Hurricane Katrina struck Louisiana, the report was preliminarily updated to note that the with- and without-project conditions in the study area were changed by the hurricane. These changes included significant property damage to port facilities, loss of coastal wetlands, and disruption to deep-draft navigation due to deposition of sediment in the MRGO. An additional assessment that considers current conditions as well as likely future conditions in the study area is necessary. the corps plans to conduct a comprehensive analysis of MRGO that would include not only economic factors but also environmental measures.

A feasibility cost sharing agreement is being negotiated for the LCA MRGO Critical Shoreline Stabilization project. This project would address the stabilization of the existing land bridge shoreline between Lake Borgne and the MRGO. This wetland feature is a critical element in any future effort to achieve channel closure as well as the implementation of a higher level hurricane protection system.

the corps is also developing a project management plan (PMP) for the longer-term MRGO Ecosystem Restoration study. The PMP will outline the range of the alternative analysis, including channel closure or reduction options, as they relate to ecosystem restoration and trade offs with economic activities across the entire study area.

The post-Katrina interagency performance evaluation taskforce is performing storm surge and wave modeling and interior drainage/flooding modeling. The results of this analysis will indicate what role, if any, the Mississippi River Gulf Outlet (MRGO) played in the flooding. If it is found that the MRGO, or any other physical feature in the area, caused or augmented the flooding, the appropriate engineering solution will be developed to address the condition.

An opportunity exists to analyze the effects of storm surges in the channel with funding provided in the FY 2006 Energy and Water Development Appropriations Act for a hurricane study for South Louisiana.

*Question 7.* General Riley, during the stakeholders meeting we held in this committee, and during last week's hearing with Mayor Nagin, one of the major points was that local redevelopment plans must drive Federal investments. For example, it may be possible to redevelop the city in such a manner that the highest levels of flood control are not required everywhere. The Mayor and the Governor both have planning processes underway. I realize that time is of the essence in rebuilding, but you don't want to spend huge amounts of resources rebuilding flood control in an area where no one is going to live. How is the corps participating in the local process to set up a redevelopment plan, and are you coordinating your decisions regarding repair of the existing projects with these groups?

Response. the corps is repairing the damaged hurricane protection system to provide the level of protection authorized by Congress prior to Katrina, as has been directed by Congress and supported by the Administration. This effort is not dependent on State and local redevelopment plans, nor can it be in view of the mission to complete the restoration by 1 June 06. We are coordinating the repair of the existing system with local and State officials, thereby enabling public interest and business investment decisions to be made. We are also participating, when invited, in local planning meetings and have met with representatives of the New Orleans business community, to share the Federal plans for restoration of the hurricane protection system. We have individuals assigned as liaisons with both the City of New Orleans and the State—Louisiana Recovery Authority to ensure full communication and awareness in the planning efforts.

*Question 8.* General Riley, we have heard informally from some experts who have laid out a specific plan for water resources, post-Katrina. It includes:

- replacing barrier islands
- restoring wetlands
- closing MRGO
- fill in canals
- move pump stations in New Orleans to higher ground.

Based on your experience and the impact of Hurricane Katrina, is this a reasonable set of actions to take?

Response. Funds have been provided through the FY 2006 Energy and Water Development Appropriations Act to undertake the investigations that would directly answer this question. Some options, such as replacing barrier islands and restoring wetlands, are universally considered reasonable components of a stronger hurricane protection system. Others need to be evaluated in more detail. These detailed analyses will be coordinated with an ongoing investigation of the current hurricane protection system by an interagency performance evaluation taskforce. The taskforce is presently examining and analyzing data from the storm and will rationally test various hypotheses about the behavior of the hurricane protection infrastructure. The taskforce will use collected data, laboratory testing, and modeling activities in its analysis. The work currently planned includes providing an updated and accurate vertical geodetic datum, performing storm surge and wave modeling; determining the hydrodynamic forces created by the storm, analyzing the floodwall and levee performance when subjected to these forces; conducting interior drainage/flooding modeling to include pumping station performance; and conducting a consequence analysis and a risk and reliability assessment.

*Question 9.* General Riley, can you give us your reaction to recent findings that repeated modes of failure in Katrina were problems at transition sections where two different levee systems joined together which would seem to suggest a more consolidated approach to managing levee systems is warranted?

Response. We did experience compromises at some of the transition sections; however, the compromises were a function of technical considerations (i.e., crossings, structure type, etc) not jurisdictional factors. As part of the repair of the existing system, we are strengthening transition zones where levees and floodwalls abut via longer transition zones and embedment depths, hardened scour zones and deeper piles. Most of the transitions referred to are within a single system where specific field conditions required transitions between types of construction such as a concrete closure structure for a road crossing in a levee. A consolidated approach to management of the system could result in more of a communication benefit than a technical benefit

*Question 10.* General Riley, I understand that you do not intend to have completed your analysis of what happened with the levees until next spring. I also know that you are planning to rebuild the existing levee system to category three protections by next June. If design flaws were part of the cause of failure, how can you rebuild until you have the ability to define and correct those flaws? Can you describe the design changes you are implementing during the levee repairs based on preliminary findings of failure modes of the levees?

Response. We are rebuilding the system to its congressionally authorized level, which is to withstand a hurricane with 100 MPH winds, a barometric pressure of 27.4 Hg, and a forward speed of 11 MPH. This is not the same as a "Category 3 hurricane", notwithstanding references to Category 3 for simplicity purposes. We must not wait until the performance evaluation is complete to begin applying what we learn. As we learn we will immediately act to incorporate those findings into the work in which we are engaged. In the interim, results are being shared on an ongoing basis with the team responsible for the repair of the existing levees and floodwalls. As the data collection teams have been completing their work, they have been convening exit briefings with representatives of the New Orleans District. Some of the design changes that we are already implementing include: replacing damaged I-walls with T-walls and L-walls and increasing the depth of sheet pile seepage barriers in the breached areas; strengthening transition zones where levees and floodwalls abut via longer transition zones and embedment depths, hardened scour zones and deeper piles; hardening surfaces susceptible to scour; and hardening surfaces around points where pipelines or other features penetrate levees.

*Question 11.* On November 9, 2005, the NAS released a report on the coastal Louisiana restoration plan. One of its major recommendations echoes themes we have heard about local redevelopment plans—they recommend the development of an explicit map of the expected future landscape of coastal Louisiana. Without this, it will be difficult to move forward with coastal restoration and flood control in a targeted manner. Can you give me your response to this recommendation and your thoughts on how it should be implemented in Louisiana?

Response. the corps' traditional approach to water resources planning was designed to facilitate problem solving and decision making for specific sites and projects. Today, the corps is being asked to use its planning capability to facilitate, convene, advise, and work collaboratively with other Federal and State programs in developing solutions and integrating programs, policies, and projects across public agencies. Collaboration is the keystone of the corps watershed approach. One way that a map of the expected future landscape could be created is through shared vision planning. Shared vision planning is a planning process that incorporates collaboration (including public participation), sound technical analysis, and tried and true planning principles into a practical forum in which resource management decisions are made. The State of Louisiana is developing a comprehensive plan for coastal protection and restoration. the corps is an integral part of this process and will be working closely with the State in the development of this plan.

*Question 12.* GAO noted in 1982 that the corps had experienced local pressure to reduce the level of hurricane protection provided. The GAO report States that in 1982, the Orleans Levee District recommended that the corps lower its design standards to provide more realistic hurricane protection to withstand a hurricane whose intensity might occur once every 100 years rather than building a project to withstand a once in 200-300 year storm. The GAO reported that the Levee District believed this would make the project more affordable, provide adequate protection, and speed project completion. How did this dynamic affect the design of the canal levees?

Response. the corps did not lower the design standards of the protection system. As part of a re-evaluation report completed in July 1984, the corps changed its recommendation from the "barrier plan" which included levees, floodwalls, and three barrier structures to a "high level plan" that would include an increased height of levees and floodwalls, but no barriers. This addressed environmental concerns with the project, reduced the overall project cost, and maintained the 300-year level of protection. the corps did not recommend construction of parallel levees along the lengths of the 17th St, London St. and Orleans outfall canals. Rather, closure structures known as "butterfly gates", placed at the mouths of the canals were recommended by the corps, thereby tying into the levee systems to be constructed along Lake Pontchartrain. The local sponsor preferred plan was the construction of parallel protection along the lengths of the outfall canals. While the cost/benefit ratio of the corps and local plans was close, closure structures as proposed by the corps were more economical as well as preferred on an engineering basis for both the London Canal (where flooding occurred) and the Orleans Canal (where no flooding occurred). Nevertheless, Congress directed the construction of the parallel protection structures in lieu of the closure structures recommended by the corps. Private architecture and engineering firms were hired to design the floodwalls and the designs were approved by the corps.

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STATEMENT OF ANU MITTAL, DIRECTOR, NATURAL RESOURCES AND ENVIRONMENT, U.S. GENERAL ACCOUNTABILITY OFFICE

Mr. Chairman and members of the committee, we are pleased to be here today to discuss the U.S. Army Corps of Engineers (Corps) Lake Pontchartrain, and Vicinity, Louisiana Hurricane Protection Project. This project, first authorized in 1965, was designed to protect the lowlands in the Lake Pontchartrain tidal basin within the greater New Orleans metropolitan area from flooding by hurricane-induced sea surges and rainfall. As you know, the effects of Hurricane Katrina breeched the levees that are part of this project and flooded a large part of New Orleans. In my testimony, I will discuss (1) the purpose and history of the project and (2) funding of the project. This statement is based on GAO's past reports on the Lake Pontchartrain and Vicinity, Louisiana Hurricane Protection Project and on the corps' flood control efforts in general, which we updated as necessary.[1]

In summary, the Lake Pontchartrain hurricane project was designed to protect areas around the lake from flooding caused by a storm surge or rainfall associated with a standard project hurricane, which is roughly the same as what is now classi-

[1]GAO, Cost, Schedule, And Performance Problems Of The Lake Pontchartrain And Vicinity, Louisiana, Hurricane Protection Project, GAO/PSAD-76-161 (Washington, D.C.: Aug. 31, 1976); GAO, Improved Planning Needed By The Corps Of Engineers To Resolve Environmental, Technical, And Financial Issues On The Lake Pontchartrain Hurricane Protection Project, GAO/MASAD-82-39 (Washington, D.C.: Aug. 17, 1982); and GAO, Army Corps of Engineers: Lake Pontchartrain and Vicinity Hurricane Protection Project, GAO-05-1050T (Washington, D.C.: Sept. 28, 2005).

fied as a fast moving Category 3 hurricane. The project, when designed in the mid-1960s, was expected to take about 13 years to complete and cost about $85 million. Over the years, the project has undergone some significant design changes as a result of a successful court challenge, local opposition to certain aspects of the proposed design, and changed Corps thinking about the most cost-effective approach. None of these changes, however, affected the level of protection provided to New Orleans because the alternative design selected was expected to provide the same level of protection. As of early 2005, the project was not expected to be completed until 2015—nearly 50 years after it was first authorized—and cost about $738 million, much of the cost increase is due to inflation over the years and changes to the scope and design of the project. In recent years, questions have been raised about the ability of the project to protect the New Orleans are from hurricanes greater than Category 3. This issue was only beginning to be studied by the corps when Hurricane Katrina hit the area in August 2005.

BACKGROUND

Since its founding in 1718, the city of New Orleans and its surrounding areas have been subject to numerous floods from the Mississippi River and hurricanes. The greater New Orleans metropolitan area, composed of Orleans, Jefferson, St. Charles, St. Bernard, and St. Tammany parishes, sits in the tidal lowlands of Lake Pontchartrain and is bordered generally on its southern side by the Mississippi River. Lake Pontchartrain is a tidal basin about 640 square miles in area that connects with the Gulf of Mexico through Lake Borgne and the Mississippi Sound.

While the area has historically experienced many river floods, a series of levees and other flood control structures built over the years were expected to greatly reduce that threat. The greatest natural threat posed to the New Orleans area continues to be from hurricane-induced storm surges, waves, and rainfalls. Several hurricanes have struck the area over the years including Hurricane Betsy in 1965, Hurricane Camille in 1969, and Hurricane Lili in 2002. The hurricane surge that can inundate coastal lowlands is the most destructive characteristic of hurricanes and accounts for most of the lives lost from hurricanes. Hurricane surge heights along the Gulf and Atlantic coasts can range up to 20 feet or more and there is growing concern that continuing losses of coastal wetlands and settlement of land in New Orleans has made the area more vulnerable to such storms. Because of such threats, a series of control structures, concrete floodwalls, and levees, was proposed for the area along Lake Pontchartrain in the 1960s.

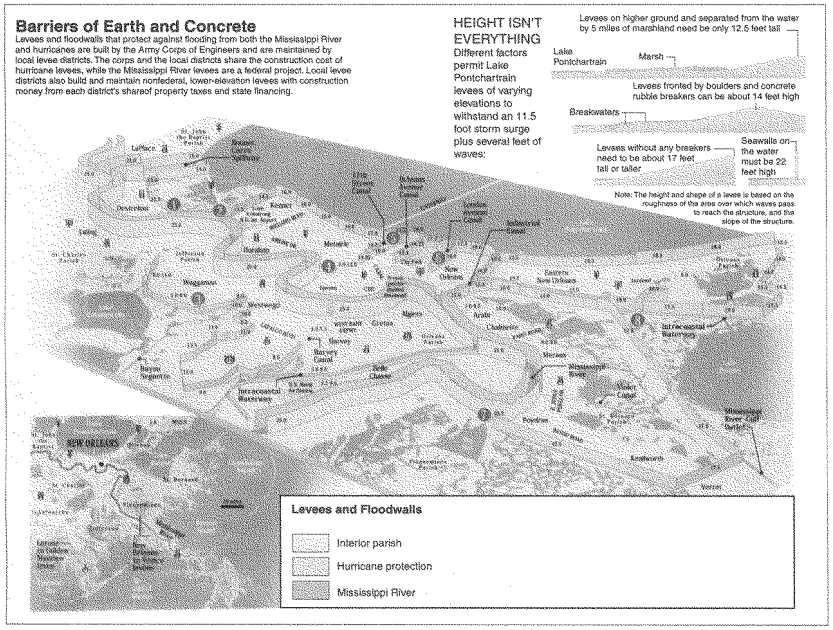
PURPOSE AND HISTORY OF THE LAKE PONTCHARTRAIN AND VICINITY FLOOD CONTROL PROJECT

Congress first authorized construction of the Lake Pontchartrain and Vicinity, Louisiana Hurricane Protection Project in the Flood Control Act of 1965[2] to provide hurricane protection to areas around the lake in the parishes of Orleans, Jefferson, St. Bernard, and St. Charles. Although Federally authorized, it was a joint Federal, State, and local effort with the Federal Government paying 70 percent of the costs and the State and local interests paying 30 percent. the corps was responsible for project design and construction and local interests were responsible for maintenance of levees and flood controls. The original project design, known as the barrier plan, included a series of levees along the lakefront, concrete floodwalls along the Inner Harbor Navigation Canal, and control structures, including barriers and flood control gates located at the Rigolets and Chef Menteur Pass areas. These structures were intended to prevent storm surges from entering Lake Pontchartrain and overflowing the levees along the lakefront. The original lakefront levees were planned to be from 9.3 feet to 13.5 feet high depending on the topography of the area directly in front of the levees.

This project plan was selected over another alternative, known as the high-level plan, which excluded the barriers and flood control gates at the Rigolets and Chef Menteur Pass complexes and instead employed higher levees ranging from 16 feet to 18.5 feet high along the lakefront to prevent storm surges from inundating the protected areas. In the 1960s, the barrier plan was favored because it was believed to be less expensive and quicker to construct. As explained later in my statement, this decision was reversed in the mid-1980s. The cost estimate for the original project was $85 million (in 1961 dollars) and the estimated completion date was 1978.

[2]Pub. L. No. 89-298, δ 204, 79 Stat. 1073, 1077.

**Figure 1: Flood Protection Control Levees In and Around New Orleans, LA.**




Source: Staff graphic by Emmett Mayer III/emayer@timespicayune.com.

The original project designs were developed to combat a hurricane that might strike the coastal Louisiana region once in 200-300 years. The basis for this was the standard project hurricane developed by the corps with the assistance of the United States Weather Bureau (now the National Weather Service). The model was intended to represent the most severe meteorological conditions considered reasonably characteristic for that region. The model projected a storm roughly equivalent to a fast-moving Category 3 hurricane. A Category 3 hurricane has winds of 111-130 miles per hour and can be expected to cause some structural damage from winds and flooding near the coast from the storm surge and inland from rains.

Even before construction began on the project, it became evident that some changes to the project plan were needed. Based on updated Weather Bureau data on the severity of hurricanes, the corps determined that the levees along the three main drainage canals, that drain water from New Orleans into Lake Pontchartrain, would need to be raised to protect against storm surges from the lake. The need for this additional work became apparent when Hurricane Betsy flooded portions of the city in September 1965.

During the first 17 years of construction on the barrier plan, the corps continued to face project delays and cost increases due to design changes caused by technical issues, environmental concerns, legal challenges, and local opposition to various aspects of the project. For example, foundation problems were encountered during construction of levees and floodwalls which increased construction time; delays were also encountered in obtaining rights-of-ways from local interests who did not agree with all portions of the plan. By 1981, cost estimates had grown to $757 million for the barrier plan, not including the cost of any needed work along the drainage canals, and project completion had slipped to 2008. At that time, about $171 million had been made available to the project and the project was considered about 50 percent complete, mostly for the lakefront levees which were at least partially constructed in all areas and capable of providing some flood protection although from a smaller hurricane than that envisioned in the plan.

More importantly during the 1970s, some features of the barrier plan were facing significant opposition from environmentalists and local groups who were concerned about environmental damages to the lake as well as inadequate protection from some aspects of the project. The threat of litigation by environmentalists delayed the project and local opposition to building the control complexes at Rigolets and Chef Menteur had the potential to seriously reduce the overall protection provided by the

project. This opposition culminated in a December 1977 court decision[3] that enjoined the corps from constructing the barrier complexes, and certain other parts of the project until a revised environmental impact statement was prepared and accepted. After the court order, the corps decided to change course and completed a project reevaluation report and prepared a draft revised Environmental Impact Statement in the mid-1980s that recommended abandoning the barrier plan and shifting to the high-level plan originally considered in the early 1960s. Local sponsors executed new agreements to assure their share of the non-Federal contribution to the revised project. The level of protection provided to New Orleans was not expected to change because the high-level design was expected to provide the same level of protection as the original barrier design.

As of 2005, the project as constructed or being constructed included about 125 miles of levees and the following major features:

- New levee north of Highway U.S. 61 from the Bonnet Carr Spillway East Guide Levee to the Jefferson-St. Charles Parish boundary
- Floodwall along the Jefferson-St. Charles Parish boundary
- Enlarged levee along the Jefferson Parish lakefront
- Enlarged levee along the Orleans Parish lakefront
- Levees, floodwalls, and flood proofed bridges along the 17th Street, Orleans Avenue and London Avenue drainage canals
- Levees from the New Orleans lakefront to the Gulf Intracoastal Waterway
- Enlarged levees along the Gulf Intracoastal Waterway and the Mississippi River-Gulf Outlet
- New levee around the Chalmette area.

The project also includes a mitigation dike on the west shore of Lake Pontchartrain.

The pre-Katrina estimated cost of construction for the completed project was $738 million with the Federal share being $528 million and the local share $210 million. The estimated completion date as of May 2005 for the whole project was 2015. Prior to Katrina, the project was estimated to be from 60-90 percent complete in different areas. The work in Orleans Parish was estimated to be 90 percent complete with some work remaining for bridge replacement along the Orleans Avenue and London Avenue

drainage canals. The floodwalls along the canals, where the recent breaches occurred, were complete. Jefferson Parish work was estimated to be 70 percent complete with work continuing on flood proofing the Hammond Highway bridge over 17th Street and two lakefront levee enlargements. Estimated completion for that work was 2010. In the Chalmette area work was estimated to be 90 percent complete with some levee enlargement work and floodwall work remaining. In St. Charles Parish work was 60 percent complete with some gaps still remaining in the levees. Closure of these gaps had been scheduled to be completed by September 2005.

Post Katrina, four investigation teams sponsored by the American Society of Civil Engineers, the corps, the State of Louisiana, and the National Science Foundation, began gathering forensic data to determine what caused the levee breaches in New Orleans. Preliminary reports from these teams indicate that they found a number of different mechanisms that caused failures in the levee system, including scour erosion caused by overtopping, seepage, soil failure, and internal erosion (also known as piping). On November 4, 2005, the corps told us that it was too soon to determine whether the change in project design had any impact on the levee breaches that occurred in New Orleans, and the Agency is still in the process of assessing whether the change in the project design had any impact on the breaches. However, the investigations necessary to address this question are not planned to be conducted by the corps as part of its ongoing examination of the performance of the existing project. Instead these investigations would be included in future analyses of any modifications to the existing hurricane protection system.

RECENT FUNDING HISTORY FOR THE PROJECT

Federal allocations for the project totaled $458 million as of the enactment of the fiscal year 2005 Federal appropriation. This represents 87 percent of the Federal Government's responsibility of $528 million with about $70 million remaining to complete the project in 2015. Over the last 10 fiscal years (1996-2005), Federal appropriations have totaled about $128.6 million and Corps reprogramming actions resulted in another $13 million

[3]Save Our Wetlands v. Rush, Civ. A. No. 75-3710 (E.D. La. Dec. 30, 1977).

being made available to the project. During that time, appropriations have generally declined from about $15-20 million annually in the earlier years to about $5-7 million in the last three fiscal years. While this may not be unusual given the state of completion of the project, the corps' project fact sheet from May 2005 noted that the President's Budget request for fiscal years 2005 and 2006 and the appropriated amount for fiscal year 2005 were insufficient to fund new construction contracts. Among the construction efforts that could not be funded according to the corps were the following:

- Levee enlargements in all four parishes
- Pumping station flood protection in Orleans Parish
- Floodgates and a floodwall in St. Charles Parish
- Bridge replacement in Orleans Parish.

the corps had also stated that it could spend $20 million in fiscal year 2006 on the project if the funds were available. the corps noted that several levees had settled and needed to be raised to provide the design-level of protection. For the last few years, the project generally received the amount of funds appropriated to it and was not adversely affected by any corps reprogramming actions.

In recent years, questions have been raised about the ability of the project to withstand larger hurricanes than it was designed for such as a Category 4 or 5, or even a slow-moving Category 3 hurricane that lingered over the area and produced higher levels of rainfall. Along this line, the corps completed in 2002 a reconnaissance or pre-feasibility study on whether to strengthen hurricane protection along the Louisiana coast. A full feasibility study was estimated to take at least 5 years to complete and cost about $8 million. In March 2005, the corps reported that it was allocating $79,000 to complete a management plan for the feasibility study and a cost-share agreement with local sponsors. The President's fiscal year 2006 budget request did not include any funds for the feasibility project.

In closing, the Lake Pontchartrain hurricane project has been under construction for nearly 40 years, much longer than originally envisioned and at much greater cost, although much of that can be attributed to inflation over these years, and the project is still not complete. Whether the state of completion of the project or the change in design played a role in the flooding of New Orleans in the wake of Hurricane Katrina in August 2005 is still to be determined as are issues related to whether a project designed to protect against Category 4 or 5 hurricanes would or could have prevented this catastrophe.

Mr. Chairman, this concludes my prepared testimony. We would be happy to respond to any questions that you or members of the subcommittee may have.

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RESPONSES BY ANU MITTAL TO ADDITIONAL QUESTIONS FROM SENATOR JEFFORDS

*Question 1.* GAO noted in 1982 that the corps had experienced local pressure to reduce the level of hurricane protection provided. The GAO report states that in 1982, the Orleans Levee District recommended that the corps lower its design standards to provide more realistic hurricane protection to withstand a hurricane whose intensity might occur once every 100 years rather than building a project to withstand a once in 200-300 year storm. The GAO reported that the Levee District believed this would make the project more affordable, provide adequate protection, and speed project completion. How did this dynamic affect the design of the canal levees?

Response. GAO does not have information on whether the 1982 comments made by the Orleans Levee Board had any impact on the design that was ultimately selected for the canal levees. As early as 1965, the corps became aware that the hurricane protection along the drainage canals would have to be strengthened; but in 1982, we reported that there was wide disparity between the corps and local sponsors about what solution could be provided under the project. In that report, we also concluded that the work at the drainage canals would present an additional financial burden to the local sponsors. Although at the time Corps officials believed that they could reach agreement with local sponsors by the end of 1982 on a solution for the drainage canals, this agreement was not reached until the early 1990s.

*Question 2.* In the opinion of the lawsuit in question, the judge wrote. The foregoing opinion should in no way be construed as precluding the Lake Pontchartrain project as proposed or reflecting on its advisability in any manner. The Court's opinion is limited strictly to the finding that the EIS of August, 1974 for this project was legally inadequate. Upon compliance with the law with regard to the impact statement this injunction will be dissolved and any hurricane plan thus properly

presented will be allowed to proceed." Ms. Mittal, can you comment on the speed and vigor with which the GAO found the corps proceeding to comply with the law?

Response. In 1982, 5 years after the court's decision, we noted that there had been no strong effort on the part of the corps to complete this project, and the corps had not prepared a suitable revised environmental impact statement to get the injunction lifted. We reported that after the court injunction the corps attempted to revise the impact statement using an interdisciplinary approach and conducted hydrologic, biologic, and chemical studies of Lake Pontchartrain. At that time, the corps told us that the full impact of the plan on the ecological and aquatic composition of the lake could not be conclusively determined without additional studies. In 1982, the corps suspended several studies being done to analyze the environmental effects that the barrier structures would have on Lake Pontchartrain because the high-level plan appeared more viable. At the time, the corps told us that studies concerning the barrier plan would require considerable additional time and expense to complete, and a resulting impact statement could not be completed until November 1985. In December 1981, the corps directed its future study efforts to the high-level plan because the corps believed that the high-level plan did not have the detrimental impacts of the barrier plan and it provided similar protection from a standard project hurricane by surrounding developed areas with higher levees.

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RESPONSES BY ANU MITTAL TO ADDITIONAL QUESTION TO QUESTIONS FROM SENATOR INHOFE

*Question 1.* Army Corps Career Staff, Fred Caver, Former Deputy Director of Civil Works, Rob Vining, Former Chief of Civil Works Program management Division, and Joseph Towers, Former Chief Counsel, New Orleans District—have all made statements of the detrimental effect the environmental litigation had on New Orleans. How did the litigation and the persistent threat of litigation influence the corps decision?

Response. As we reported in 1976 and 1982, the threat of litigation and the court injunction in 1977, were two of several factors that caused delays in the construction of the Lake Pontchartrain hurricane protection project according to the corps' schedule. In 1982, the corps' Office of the Chief of Engineers noted that because of the environmental litigation, the corps had a general reluctance to proceed with the barrier project, because it lacked the in-house capability to determine how to perform the required environmental studies to satisfy the court. In 1982, the corps also stated that this had contributed to project delays despite the high priority designation by the Agency. Based on Corps statements, it appears that the court case was also a factor that influenced the corps decision to shift from the barrier plan to the high-level plan in the mid 1980s. After the corps concluded that the high-level plan provided the same level of protection as the barrier plan and was more cost effective to build, it shifted to constructing the high-level plan and anticipated completing the project by 2015. Construction on the portion of the levee system that failed during Hurricane Katrina had been completed.

*Question 2.* In your testimony before the House you reported a position on behalf of the corps about the two different hurricane plans stating that one was better than the other. Since then, GAO has changed their position because the evidence supporting this was called into question. Is that your understanding?

Response. GAO's position about the level of protection provided to New Orleans by the two hurricane project alternatives has not changed. Both projects were designed to protect New Orleans from a standard project hurricane, thereby providing the same level of protection; this position is reflected in both our September and November 2005 statements. In our September statement, we also accurately reported that some Corps district officials believed that the change in hurricane protection design did not cause the levee breaches and that flooding would have occurred with either design. This observation, we believe, was based on the general sense within the corps at that time that Hurricane Katrina had resulted in Category 4 level storm surges, which had caused the levees to be overtopped, and which in turn resulted in scouring that caused the levee breaches. However, between September and November, new information became available from the investigative teams studying the levee breaches, which indicated that not all of the breaches were caused by overtopping, especially those that occurred on the drainage canals, which were the breaches that led to most of the flooding in downtown New Orleans. A variety of other potential causes such as construction flaws and failure to fully consider subsoil conditions in the levee design, are now being evaluated as well. In addition, Corps officials in Washington told us that the statements made by the district did not reflect the corps official position and that it was too early to determine

whether the change in design had any impact on the levee breaches. In light of this new information, and in an effort to provide the committee with the most current and relevant information, GAO slightly modified its statement for the November 9, 2005 hearing.

*Question 3.* Is it fair to say that GAO has focused their analysis on the funding of the corps projects and not on technical issues?

Response. For our September and November 2005 statements on the history, current status, and funding for the Lake Pontchartrain Hurricane Protection project, GAO relied extensively on information contained in issued reports from 1976 and 1982, as well as information obtained from Corps documents and officials regarding the current status and the funding requests and appropriations for the project during the last 10 years.

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STATEMENT OF WINDELL CUROLE, GENERAL MANAGER, SOUTH LAFOURCHE LEVEE DISTRICT

To adequately discuss what to legislate in order to deal with Louisiana's water resources needs, we should first pause and reflect on the past. The purchase of New Orleans, and subsequently Louisiana, was based on the need to trade the goods and crops of the Midwest to the rest of the world. It is no less important today. Today the goods traded through South Louisiana have become more valuable to the Midwest and other segments of the United States Its importance has increased because of energy, seafood, refineries and petro chemical plants.

In 1849 the Federal Government granted to Louisiana most of the Federal land in Louisiana so that revenues from the use and sale of the land would produce an economy which could produce income to the Federal Treasury. This proved to be beneficial to the Federal Government.

Again, after the 1927 flood the Federal Government provided legislation which resulted in reduced flooding, which has produced both improved navigation and flood protection. This, in turn, has led to one of the most important economic river corridors in the world, that which is located between Baton Rouge and New Orleans.

These important functions unintentionally led to increased threats from the tidal events and hurricanes by depriving the adjacent lands from the overflow of the river. Much of these lands, wetlands, marshes and ridges built and sustained by the river, have reverted to open water resulting in the loss of 2,000 square miles since 1930.

Although the loss of support from the river had been critical, oil exploration, navigation canals and other development have also made South Louisiana more susceptible to tidal events. This loss in the latter half of the last century has been occurring at approximately 25 to 35 square miles a year. Subsidence, the loss of elevation, has also affected South Louisiana. Some estimate a loss of three feet in elevation over the last 100 years. Since most of South Louisiana is below a 10 foot elevation above sea level, this has allowed the Gulf of Mexico closer to our communities.

Hurricane protection projects have been constructed and have protected communities from the effects of subsidence and coastal erosion. A more comprehensive approach would result in more security not only for South Louisiana, but the goods and services that South Louisiana provides for the country.

The platform which is South Louisiana is a working coast which produces energy, seafood, and trade which greatly benefits the United States. Investment by the United States should be considered because of what South Louisiana provides for the nation.

Economic justification should again convince Congress that investment in Louisiana will result in a positive return on its investment.

To invest properly and to insure the best return, the needed projects in flood protection, coastal restoration and navigation should be done in conjunction with each other and done quickly. To accomplish this, agencies like the corps must streamline its procedures which cause delays, cost increases, and diminished results.

One of the reasons we have the human part of this natural disaster is loss of focus. Projects designed to mitigate the threat were ignored. We must design a position which has the capability on the local, State, and national level to involve the political leadership to work on issues which mitigate the risk from reoccurring natural disasters.

To build the necessary flood protection in a timely fashion, we must devise a system which is true to environmental laws, yet does not cause people to suffer, and communities to flood while waiting as the environmental community ponders and delays work. We must do better in building environmental projects which are agreed

upon quickly, economically, and built to last. In most instances today, our environmental projects fall short in service to our people.

I mention money last because I believe changes must be made to reduce cost in order to build more protection, more efficiently. We must work as hard as possible to insure that as much money as possible reaches contractors who will build well designed protection. Over studying, investigating and planning will not stop or reduce flood damage. Only physical barriers, levees, and environmental infrastructure will give people and communities a chance of surviving a hurricane.

We suggest that a funding stream based on a share of offshore oil revenues generated off the Louisiana coast would be the most reasonable approach to fund these projects. Some of the problems in South Louisiana have directly resulted from its support of the nation's energy needs. Most Americans would agree with the fairness of this approach. Most Americans will benefit from the proper attention to the flood problems of South Louisiana.

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RESPONSES BY WINDELL CUROLE TO ADDITIONAL QUESTIONS FROM SENATOR JEFFORDS

*Question 1.* Mr. Curole, can you describe what you would anticipate the reaction would he by the local communities if the corps rebuilds flood protection to category three that is later found to be fatally flawed?

Response. It would simply be an outrage, The Corp specifications are used as standards. Local sponsors are forced to follow and accept Corps recommendations or not build a project.

Some projects are made so expensive that the projects cannot be constructed. the corps' procedure and process adds to the cost and time for construction without improving the safety or performance of a project.

It is for this reason that to have a flawed project is hard to accept. The weakest part of the system is that between the corps inspector and the contractor. As a local sponsor to a Corps project, if the contractor was good and the inspector suspect or, the inspector was good and the contractor suspect, I had confidence that the job would he done well. If both were suspect, I tried to have one of my employees on the construction site at least on a daily basis.

*Question 2.* During the stakeholders meeting we held in this committee, and during last week's hearing with Mayor Nagin, one of the major points was that local redevelopment plans must drive Federal investments. For example, it may be possible to redevelop the city in such a manner that the highest levels of flood control are not required everywhere. The Mayor and the Governor both have planning processes underway. I realize that time is of the essence in rebuilding, but you don't want to spend huge amounts of resources rebuilding flood control in an area there no one is going to live. Can you give me your impressions of how this process is proceeding?

Response. Replacement and improvement of the levee system for the best economy would place that protection in generally the same area, Even if certain neighborhoods are not re-established, major infrastructure, like roadways, will need protection. The question of improved flood protection above category three would apply to the areas like St. Bernard. We expect people will move back to areas with category three protection., but those communities, without higher protection, will not realize full redevelopment.

*Question 3.* Mr. Curole, can you give us your reaction to recent findings that repeated modes of failure in Katrina were problems at transition sections where two different levee systems joined together which would seem to suggest a more consolidated approach to managing levee systems joined together which would seem to suggest a more consolidated approach to managing levee systems is warranted?

Response. Consolidation or a comprehensive approach has been needed, but some problems existed because of planned separations in the systems due to navigation canals. A comprehensive hurricane design is an area where the corps has been requested and could, with proper support, have a consolidated plan. The State is working toward a consolidated plan which we, the Levee Board Association, have been promoting since 1997. The Mississippi River levee system from Cairo, IL to the Gulf is an example of a comprehensive hurricane plan executed with local entities.

*Question 4.* The USG has reported extensive wetlands losses post-Katrina. How would you recommend the corps re-evaluate its recommendations for restoration of coastal Louisiana in terms feasibility given these wetlands?

Response. The losers are in areas which already have had losses. The hurricanes took away what would be lost over the next 5 to 10 years. The projects which are

proposed for restoration continue to he useful. I believe that more aggressive projects may be able to be supported with a reduced need for study.

*Question 5.* On November 9, 2005, the NAS released a report on the coastal Louisiana restoration plan. One of it major recommendation echoes themes we have heard about local redevelopment plans. They recommend the development of an explicit map of the expected future landscape of coastal Louisiana. Without this, it will be difficult to move forward with coastal restoration and flood control in a targeted manner. Can you give me your response to this recommendation and your thoughts on how it should be implemented in Louisiana?

Response. This is a chicken and egg situation. We can draw a line if support for projects is provided. I would look at first protecting the wetlands around our ridges and work toward maintaining our barrier islands. Next is to maintain the marsh fringe around the bays and lakes. Leadership in Louisiana should prioritize wetlands which protect infrastructure and attempt to maximize the functions of an estuary. This means to have freshwater regime which gradually transform into intermediate brackish and salt water near the Gulf. I believe we can provide a map reflecting the future. I would create teams of scientists who have like beliefs to develop their different images of the future. I would then have the Governor's Advisory Committee on Coastal Restoration accept one map which reflects the consensus of the committee.

*Question 6.* One of the Key themes we have heard is that cost-benefit analysis procedures we should be revised most significantly to account for potential loss of life. What are your views on the revision or abandonment of cost-benefit analysis as a decision-making tool for the corps?

Response. The cost-benefit concept is a valid method; the problem is the definition of what has value and its determination. Population has a place in benefit. The problem is the value of community. I do not know how to make the balance of the population, the economical value and the environmental value. It is difficult, but I believe that all three should have standing in cost-benefit calculations. Often projects for one local produce regional benefits which should also be included.

*Question 7.* Given the corps' experience in Hurricane Katrina, can you tell us if you believe that the Federal Government should do more to ensure the safety of our Nation's levee program? For example, should safety standards and an inspection regime be established?

Response. It appears that a need exists to insure that systems are built to specifications. I believe that Corps project managers should be made responsible for the performance of the projects of which they are designated. The State is presently planning for an inspection system. Previously the State assisted in the corps inspection program.

*Question 8.* There has been much discussion of the Mississippi River Gulf Outlet and the effect it had in magnifying the storm surge that reached New Orleans. Can you give me your specific recommendations regarding this Outlet in light of what happened during Katrina?

Response. The intersection of the Mississippi River Gulf Outlet with the Gulf Intracoastal Canal at a juncture where two levee systems funnel the water well logically cause higher water levels.

A closure on the Mississippi River Gulf would reduce water levels, but or the large powerful storm, some damage may not be altered.

A structure across the Intracoastal Canal just east of the intersection of the Mississippi Gulf Outlet would reduce the entry of storm water toward the industrial canal.

I have no personal experience with the storm surges of that location and I base my comments on the run up of storm water at the intersection of the levees in my area. Please accept my comments on the Mississippi River Gulf Outlet in that perspective.

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## STATEMENT OF PETER BRINK, SENIOR VICE PRESIDENT, PROGRAMS, NATIONAL TRUST FOR HISTORIC PRESERVATION

### INTRODUCTION

Chairman Inhofe and members of the committee, thank you for the opportunity to testify today on the recovery and rebuilding efforts underway in coastal Louisiana as you consider legislation on a comprehensive approach to the water resources needs of that area. As the people of the Gulf Coast move forward to restore countless historic homes, buildings and landscapes damaged by Katrina, let me empha-

size the role that Congress can and should play in ensuring that historic properties in this region are afforded the maximum possible protection against catastrophic storms. This part of the country has an enormously rich history with one of the largest concentrations of historic buildings in the United States.

In addition to fostering the stewardship of our Nation's heritage, historic preservation is a powerful force in the local and State economy. In Louisiana, culture means business and it relies upon the full development of a unique and irreplaceable heritage of historic districts, historic buildings, and places. A recent survey shows that 28 percent of those who visit Louisiana typically come to enjoy its distinctive neighborhoods and visit individual historic properties. With regard to New Orleans, 10.1 million people visited in 2004 and spent $5.5 billion dollars there; 75,000 people were directly employed in the travel industry there. As attention shifts from rescue to reconstruction in New Orleans and the Gulf Region, we must answer the question of how, and in what form, the rebuilding will happen, and how its historic fabric will be protected for generations to come. If we get the response wrong, Katrina could turn out to be among the greatest cultural disasters the nation has ever experienced and a disaster from which Louisiana may never fully recover.

For more than 50 years, the National Trust for Historic Preservation has been helping to protect the nation's historic resources. The National Trust is a private, nonprofit membership organization dedicated to protecting the irreplaceable. Recipient of the National Humanities Medal, the Trust provides leadership, education and advocacy to save America's diverse historic places and revitalize communities. Its Washington, D.C. headquarters staff, 6 regional offices and 26 historic sites work with the Trust's quarter-million members and thousands of local community groups in all 50 States. As a private nonprofit organization, the National Trust is the leader of a vigorous preservation movement that is saving the best of our past for the future. Its mission has expanded since its founding in 1949 just as the need for historic preservation has grown. When historic buildings and neighborhoods are torn down or allowed to deteriorate, we not only lose a part of our past forever, we also lose a chance to revitalize our communities.

SAVING OUR HERITAGE

In dealing with the Mississippi River floods of 1993, the Northridge earthquake of 1994, and numerous other natural disasters, the National Trust has learned that often, the first impulse of local officials is to tear down almost every damaged building in the name of public safety. We have also learned that this first impulse is almost always wrong. Obviously, some historic buildings—perhaps many of them—will necessarily be lost, but we should not lose more than we have to. Building inspectors in New Orleans are already at work and have evaluated the structural integrity of more than 50,000 of the city's roughly 110,000 homes damaged by the hurricane. While the inspectors' findings are not the final word, they indicate that thousands of New Orleans homeowners may face a tough decision between demolishing their homes and opting for new construction, or choosing to renovate.

Some unfortunate demolitions have already taken place, including the hasty razing of the Naval Brigade Hall, a significant landmark in the history of New Orleans jazz. This 102-year old Warehouse District building, which the city had declared uninhabitable, was a site on the National Park Service's jazz tour. It was torn down on September 26th without permits or permission from the city or owner. This is why any building deemed unsalvageable and recommended for demolition must be reviewed by the State historic preservation officer in Baton Rouge, who will determine if the property needs a Section 106 review. This is essential for all buildings that might be considered historic.

On the legislative front, the National Trust urges the committee to safeguard coastal Louisiana's historic legacy by following three basic principles:

1. *Provide the best infrastructure for the Nation's premier historic area.*—Congress should provide all necessary resources to rebuild a levee system that recognizes the need to protect the nation's richest inventory of historic treasures. This includes the city's levees and completing a system of hurricane protection southward toward the Gulf and in the suburbs once and for all. It should anticipate the worst—a category 5 hurricane or the drenching slow-moving storm.

2. *The restoration and redevelopment of protective wetlands.*—Natural water resources must compliment man-made infrastructure to mitigate the damaging effects of future catastrophic storms. Erosion along Louisiana's coast has eliminated over 1 million acres of wetlands at an ever-quickening pace. As a result, the Army Corps' own hurricane protection levees have become more vulnerable. They were built with the understanding that they would be buffered from winds and storm surges by 40

to 50 miles of protective swamp and marsh. The communities these levees protect are now constantly vulnerable with higher surges and stronger wind-driven waves.

3. *Full compliance will the National Historic Preservation Act's (NHPA) Section 106 requirements.*—Thorough Section 106 review must be part of any Army Corps of Engineers work and in all Federal Agency actions related to rebuilding Louisiana's infrastructure. Section 106 provides a process that requires those agencies to "take into account" the effects of their decisions and their projects on historic properties, and to work with States, tribes, and local communities to seek ways to lessen the effects of those projects. It requires a process, not an outcome. The goal is not to save every historic site but to make sure that they are considered and that their value is weighed against other public values.

Furthermore, the National Trust sees historic preservation as a critical component of revitalizing the Gulf Coast Region's economy and making its neighborhoods whole again. We, along with the American Institute of Architects (AIA) are asking Congress to pass a package of tax incentives and grants to restore and rehabilitate historic structures affected by Katrina, and we urge your support. I will provide you with details on our proposals, but let me describe the magnitude of the situation first.

BACKGROUND AND OVERVIEW

I recently visited southeastern Louisiana; the damage and loss to buildings is catastrophic, affecting Federally, State, and locally designated historic treasures. In New Orleans alone the National Trust estimates that Katrina's devastating winds, rain, and subsequent flooding have in some way affected the 38,000 designated structures across the city's historic districts.

The scope of the crisis is so great because the Gulf Coast Region itself has one of the Nation's largest collections of historic buildings. Since the French crown established settlements to make a permanent presence close to the Mississippi starting with Biloxi Bay in 1699, the area has been home to a blend of cultures, traditions, buildings, and landscapes unlike those found anywhere else in the United States. So much of its architectural uniqueness was influenced by the convergence of a rich antebellum planter society and a powerful commercial economy driven by river, port, and Gulf. Nowhere is this more apparent than New Orleans, once the largest city west of the Appalachians and the nation's third largest by 1830. The city contains 20 National Register historic districts encompassing half of its total area, the largest concentration of historic districts in the United States. This is why we must make every effort to rebuild and restore this area, and why we must acknowledge the special character of this entire region. Failure to do so would compound the devastation that has already occurred.

What is needed first are conscientious, comprehensive surveys conducted by experts in construction, architecture, engineering and preservation—people who can examine an older building's condition, evaluate its historic and architectural significance, and determine the feasibility or advisability of saving it. With generous funding assistance from the Getty Foundation, American Express Foundation, and other sources, the National Trust has already sent survey teams into Mississippi and New Orleans. The final decision on what buildings can—and should—be saved will be made by property owners, city officials and FEMA, but the work of the survey teams will give them the facts they need to make informed decisions and rational recovery plans.

I saw first-hand that the French Quarter and the Garden District are largely intact. That's good news, certainly, because these areas, with their imposing white columns and lacy cast-iron galleries, constitute the world-renowned public face of New Orleans. But the down-home heart of the city beats in lesser-known neighborhoods such as Holy Cross, Treme, Broadmoor, and Mid-City, where officially designated historic districts showcase the modest Creole cottages, corner stores, and shotgun houses (long, narrow houses, usually only one room wide with no hallway) that are essential ingredients in the rich architectural mix that is New Orleans. Saving as many of them as possible is essential.

I came away convinced that the vast majority of them can be saved and this conclusion is being confirmed by our survey teams as well. Most homes inspected so far, about 60 percent, have been judged to have some structural damage, but few are thought to be in danger of collapse.

Many times in recent years, when communities were devastated by earthquakes, floods, tornadoes or hurricanes, we at the National Trust have worked with local officials and our preservation partners to determine the communities' needs and figure out how we could help most effectively whether by providing funds or technical assistance. But the unprecedented ferocity of this hurricane season has confronted

us with a disaster like none we have experienced before, and it calls for solutions like none we have developed before. The NHPA and Section 106, however, should be fundamental in any strategy.

THE IMPORTANCE OF SECTION 106

Historic preservation is the process of identifying places, sites and resources that have survived from our past; evaluating the meaning and value they have for us now; and keeping, using and caring for those significant places, sites and resources so they will survive into the future. The preamble to the NHPA, as passed by Congress in 1966, reminds us that "The spirit and direction of the nation are founded upon and reflected in its historic heritage;" and that "the historical and cultural foundations of the nation should be preserved as a living part of our community life and development in order to give a sense of orientation to the American people." Congress further clarified in 1980 that "the preservation of this irreplaceable heritage is in the public interest."

The NHPA protects the rights and values of private property owners, local officials, and citizens across the United States, and gives them a place at the table when the actions of Federal agencies threaten to affect their historic properties and their communities. Section 106 helps governmental agencies protect and cherish our American history as Congress intended.

DISASTER ASSISTANCE PACKAGE FOR HISTORIC PRESERVATION

To make saving historic buildings a reality, I urge Congress to provide targeted sources of Federal and State funding for the preservation of storm-damaged structures. A coalition of national preservation organizations led by the National Trust and the AIA are supporting a legislative package to direct Federal and State resources for preservation efforts in the disaster area. The immediate goal is to stabilize and repair damaged but savable buildings before weather and the elements lead to further erosion of the historic fabric. The first and most urgent part of these legislative measures would provide immediate Federal preservation grant assistance to historic property owners and supplement any funds from insurance companies, FEMA, and other sources. We have asked Congress for a two-year $60 million "Historic Preservation Disaster Relief Grants Program" from the Federal Historic Preservation Fund to be administered by the States with no Federal match. Applicants would agree to rehabilitate their properties in accordance with agreed-upon preservation standards and principles. The National Trust is hoping to use a small portion of these grants $2 to $5 million to target key designated "Main Street" organizations with funds for preservation planning, technical, and business assistance. So much of this region's recovery will depend on making local, neighborhood-serving, commercial districts many of which are already designated "Main Street" communities viable once again.

Second, the existing tax credit for rehabilitating historic commercial structures should be streamlined and adjusted to work vigorously as a targeted incentive for restoring damaged historic buildings, especially those that house critical neighborhood-serving retail in "main street" business communities. We have developed a list of recommendations that would accomplish this goal. While the existing tax credit program is commendable for its success in fostering the restoration of countless historic buildings across America, there are also a number of structural elements surrounding the program that Congress should address to make it more effective in the disaster area. National Park Service data show that last year, for example, Federal historic tax incentives for commercial properties leveraged over $3.8 billion in private capital into the national economy. Louisiana ranked sixth in approved "part two" projects and Mississippi ranked 17th in this activity along with Alabama.

Last, taking its cue from the existing tax credit program for income-producing, commercial properties, Congress should provide a new credit for homeowners of historic owner-occupied residential buildings, which are currently ineligible for any restoration incentives. Our "Disaster Relief Historic Homeowner Assistance Tax Credit" proposal would provide a credit of 30 percent of qualified rehabilitation expenditures made by persons who substantially rehabilitate historic homes located in the Hurricane Disaster Area and used as a principal residence. It would be limited to $40,000 total per household.

These longer-term tax incentives to rebuild would infuse private sector dollars in a region desperate for reinvestment and encourage property owners to return to these devastated places.

For all these proposed grants and tax incentives, the framework and infrastructure created by the NHPA, the partnerships it establishes between the Federal and State Governments, and its reliance on close cooperation with local preservation or-

ganizations, can be an excellent mechanism to deliver our historic preservation assistance package that the region needs. What Congress must support, however, are these additional resources, adjustments, and innovations to make it work most effectively in responding to the disaster. The good news is that the NHPA has already created the core of any response to saving historic resources in the Gulf Coast Region. What began back in 1966 in response to a grassroots movement to protect America's architectural and cultural legacy, has become a strong Federal preservation program administered by the Department of the Interior. Its implementation relies on a strong link between the Agency and the State Historic Preservation Officers in every State and the territories. Congress should utilize it as a tool.

CONCLUSION

The economic role of historic preservation and the Federal, State, and local resources it bears are tantamount to revitalizing the commercial stability of the region and preserving it for future generations. Rising out of its past, the Gulf Coast remains one of the nation's most important centers of economic activity and so many historic buildings are where its people actually live and conduct daily business, commerce, and tourism. The goal of rebuilding efforts should be to allow displaced people to come home to communities that are healthy, vibrant, familiar places to live and work and Federal, State, and local Governments in the region—provided with adequate resources—should make every effort to save those buildings where possible. From the fishing and shrimping industries, to the Port of South Louisiana, to the heart of the country's petrochemical industry, restoring historic structures is essential to restoring the well-being of so many communities in the States affected by Katrina. Mr. Chairman, ultimately the question of how the Gulf Coast region should be rebuilt is one that its residents must answer. Let us hope they get the chance to do so before their region's future is decided for them. This committee's role is critical to influencing that decision.

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RESPONSES BY PETER BRINK TO ADDITIONAL QUESTIONS FROM SENATOR JEFFORDS

*Question 1.* Mr. Brink, can you give me your perspective on how we can balance the need to preserve historic structures and the need to ensure that the people affected by this disaster are able to meet their basic needs of food, clothing and shelter?

Response. The National Trust believes historic structures are a key resource to provide shelter to people affected by the disaster. Thus:

- In New Orleans along, there are 37,000 historic homes and other buildings in the city's National Register Historic Districts. These districts cover nearly half of the central land area of New Orleans; there are some grand houses, but the overwhelming majority is comprised of cottages, shot gun houses, and other vernacular buildings suitable for housing for low, moderate and middle-income families.
- The great majority of these houses is savable to become homes again for their owners or residents. In Mississippi there are an estimated 1,000 historic homes damaged. In New Orleans, though we're awaiting completion of City inspections, work as of November 22 indicated that throughout the city (not just historic areas) 3,600 of 118,000 structures inspected were given Red Tags, or about 3 percent, as prohibiting entry. In addition there are many thousands of Yellow Tag buildings, which require work prior to being habitable.
- The ULI Expert Team and Advisor Panel (Nov. 12-18) in New Orleans, of which I was a member, found a number of structures in the historic areas that were vacant prior to Katrina. A recommendation of their draft report was to quickly refurbish empty existing public housing units and use these for immediate housing for displaced persons. (The final ULI report will be submitted to the Mayor's Bring New Orleans Back Commission within the coming few weeks.)
- The National Trust with the Preservation Resource Center of New Orleans has already begun work on four demonstration houses, and we are seeking 4 additional ones at this time. Our goal is to provide models and build momentum for home owners to undertake the necessary mold remediation and rehabilitation to make their homes livable again and return to them. This is feasible for most houses with moderate to medium flooding. Similarly in Mississippi, the Trust has partnered with the Mississippi Heritage Trust to undertake the structural repair of 4 demonstration houses. The Trust is seeking to raise additional private funds to expand the number of demonstration houses throughout the disaster area.
- In addition the Trust, with Gulf Coast partners, has requested a Federal appropriation of $60 million from the Historic Preservation Fund for grants to the Gulf Coast State Historic Preservation Offices for them to provide grants up to $40,000

apiece for rehabilitation of damaged homes in the extensive National Register Historic Districts. Such an appropriation would do much to enable savable historic homes to provide shelter to thousands of owners and residents in the disaster area. (In addition the request includes $2 2 and a half million for the National Trust Main Street Center to provide grants to State and local Main Street programs in the disaster area.)

*Question 2.* During the stakeholders meeting we held in this committee, and during last week's hearing with Mayor Nagin, one of the major points was that local redevelopment plans must drive Federal investments. For example, it may be possible to redevelop the city in such a manner that the highest levels of flood control are not required everywhere. The Mayor and the Governor both have planning processes underway. I realize that time is of the essence in rebuilding, but you don't want to spend huge amounts of resources rebuilding flood control in an area where no one is going to live. Can you give me your impressions of how this process is proceeding?

Response. The pro bono ULI team invited by the Mayor's Bring Back New Orleans committee made the difficult recommendation that recovery should proceed in geographic stages. This was in recognition that the city will have a smaller population in the immediate coming years and that some areas of the city suffered significantly greater flood damage and are at greater risk for future damage than others. Thus the ULI team recommended viewing the city in terms of three major investment zones: Zone A most severely impacted; Zone B medium impact, with large numbers of historic houses; and Zone C least impacted and coinciding with the city's early historic development. The team recommended immediate support for property owners and City action to support remediation and rehab in Zones B and C. It recommended further study of Zone A regarding flood risk, environmental factors, and best future development and uses.

The Trust concurs that the immediate and urgent goal is to achieve a full and absolute compliance with full Category 3 protection for New Orleans by this June and the upcoming hurricane season, as well as a longer range plan to enhance this protection as additional study shows needed. Following the ULI analysis, this building could be staged to reflect the zones identified.

The Trust also believes that it is critical to initiate programs to rebuild the wetlands buffer that used to help protect New Orleans. Each 2.7 miles of marshland reduces a storm surge by a full foot. (Michael Tidwell, author of the book Bayou Farewell in Orion, December, 2005). Reports indicate that since World War II a land area the size of Rhode Island has turned into water. (Ibid.) A full-scale program to rebuild this important part of New Orleans' protection is urgently needed. Katrina has accelerated projected loss of wetlands.

*Question 3.* Mr. Brink, I understand that Louisiana ranks 6th in the nation in terms of the amount of historic tax credits granted. Data from 2004 shows that in Louisiana, this tax credit produced 15,000 units of housing, 40 percent of which was affordable housing. The Senators from Louisiana recognize this and have proposed 150M in direct grants for historic preservation in Louisiana, including 25 million earmarked for the Trust. Can you describe how these types of resources for historic preservation could be used in Louisiana to drive economic development in low-income communities impacted by Katrina?

Response. Last year Louisiana ranked sixth in the Nation in historic tax credit activity, but on average it places fourth. This is indicative of the vast inventory of historic resources eligible for the credit and the good work of the State Historic Preservation Office, the preservation community, and local developers. Actually, in 2004, the 15,000 units of housing produced through the credit is a nationwide statistic, not specific to Louisiana, though we know that a good deal of housing is created in that State through the historic tax credit, especially when it is twinned with the Low-Income Housing Tax Credit to make housing affordable.

Specifically, there were 36 projects in Louisiana last year totaling $52.5 million in certified expenses. That is a considerable sum in terms of private sector investment. This is why the Trust would like Congress to use historic preservation—in the tax credit and grants for historic buildings—to help in rebuilding the Gulf Region. Let me underscore that tax credits and grants are incentives, though. It is sometimes more expedient and less costly to tear down and build anew. To the maximum extent practicable, we do not want to see this happen in the Gulf Region, particularly in New Orleans. We want to preserve our historic treasures and at the same time, make sure that the economic benefits of preservation, rehabilitation, and restoration reach way down into the neediest neighborhoods through incentives like these.

From a general perspective, historic rehabilitation projects create more jobs than new construction. Typically, in new construction half of the investment goes to ma-

terials and half to labor. In historic rehabilitation, 60 to 70 percent of the investment goes to labor creating more jobs. In comparing $1 million spent on new construction with $1 million spent on rehabilitation: five to nine more construction jobs will be created by a rehabilitation project than new construction; and 4.7 more new non-construction jobs will be created by a rehabilitation project.

• Plus, rehabilitation will have a multiplier effect on local spending. The skilled labor that is needed for a rehabilitation project is often found locally. When jobs are created for local electricians, carpenters, painters, etc., they, in turn, will be spending their earnings locally. Local grocery and hardware stores, automobile dealers, and clothing stores will see the benefits as well as the county Government, which will benefit from the increased tax revenue. In a comparison of $1 million dollars of spending on new construction and $1 million dollars of spending in rehabilitation:

—Household incomes in the community will increase by $107,000 more by a rehabilitation project than new construction.

—Rehabilitation will cause retail sales to increase $34,000 more than with new construction.

—$120,000 more will initially stay in the community in a rehabilitation project.

• The existing Federal Historic Rehabilitation Tax Credit for income-producing properties has spurred private investment on a 5 to 1 ratio, and it has become a powerful tool for job creation. These benefits are critical in rebuilding the communities ravaged by Katrina. Over $28.7 billion in private investment has been leveraged from its inception in 1976 until Fiscal Year 2002. Each project approved by the National Park Service creates on average 42 new jobs (principally local). In Fiscal Year 2002, 50,484 jobs were created by rehabilitation projects.

• Dollar for dollar, historic rehabilitation creates more jobs than most other investments. According to a 1997 study by the Center for Urban Policy Research at Rutgers University on the economic impacts of historic preservation, "preservation's benefits surpass those yielded by such alternative investments as infrastructure and new housing construction."

*Question 4.* On November 9, 2005, the NAS released a report on the coastal Louisiana restoration plan. One of its major recommendations echoes themes we have heard about local redevelopment plans they recommend the development of an explicit map of the expected future landscape of coastal Louisiana. Without this, it will be difficult to move forward with coastal restoration and flood control in a targeted manner. Can you give me your response to this recommendation and your thoughts on how it should be implemented in Louisiana?

Response. The National Trust agrees that Federal, State, and local officials, with the public's involvement, need to take a broader look at where land in coastal Louisiana should and can be restored. It is simply logical that an explicit map of the desired future landscape of coastal Louisiana should be developed as soon as possible to guide the selection of more-integrated restoration projects in the future. Until more information becomes available, it would be premature to comment on the extent to which wetland loss contributed to the devastating effects of hurricanes Katrina and Rita.

It seems that most of the individual projects in a U.S. Army Corps of Engineers proposal to reduce losses of coastal wetlands in Louisiana are scientifically sound, but taken together they do not represent the type of integrated, large-scale effort needed to accomplish coastal restoration in its most effective sense.

The Trust looked at the NAS study. The projects in the report are only intended to lay a foundation for more aggressive efforts to preserve and restore coastal Louisiana. The study should be the precursor for a much more comprehensive, system wide plan for the entire coastal region. That is what is needed to design a clear, and articulate roadmap for the future distribution of land and ultimately restore coastal wetlands effectively.

The National Trust's testimony focused on the economic benefits of historic preservation in a region with tremendous economic potential to the nation. Without a comprehensive map of a restored coastal Louisiana, it is difficult to determine how wetland renewal efforts may foster this economic potential in the long-term.

*Question 5.* One of the key themes we have heard is that cost-benefit analysis procedures should be revised—most significantly to account for potential loss of life. What are your views on the revision or abandonment of cost-benefit analysis as a decision-making tool for the corps?

Response. The Trust believes that cost benefit analysis is an important tool and that it should fully take into account potential loss of life.

*Question 6.* Given the corps' experience in Hurricane Katrina, can you tell us if you believe that the Federal Government should do more to ensure the safety of our

Nation's levee program? For example, should safety standards and an inspection regime be established?

Response. The Trust believes that the Federal Government should set safety standards and an inspection regime for all levees built in whole or in part with Federal funds. This should help prevent the type of breakdowns in the performance of levees experienced with such disastrous consequences in Katrina.

*Question 7.* There has been much discussion of the Mississippi River Gulf Outlet and the effect it had in magnifying the storm surge that reached New Orleans. Can you give me your specific recommendations regarding this Outlet in light of what happened during Katrina?

Response. The Trust has not studied first-hand the role of the Mississippi River Gulf Outlet with regard to Katrina. We have heard, especially during the ULI interviews that knowledgeable residents believe that the MRGO acted as a funnel enabling Katrina to shoot through it to reach the city in the shortest distance and time possible. We have also heard that the initial cost-benefit analysis by the Army Corps of Engineers projected usage of the MRGO well in excess of the reported 1 1/2 ships a day that were using the canal just prior to Katrina. These widespread beliefs would compel the corps to complete needed analysis of the impact of the MRGO regarding both risks to human life and potential benefits to commercial activity, and make a responsible decision prior to the coming hurricane season on whether to close the MRGO. In the meantime no funds should be spent on the repair of the MRGO.

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STATEMENT OF SCOTT FABER, WATER RESOURCES SPECIALIST, ENVIRONMENTAL DEFENSE

Hurricane Katrina was a terrible tragedy that has touched the lives of every American. As we rebuild, we must rebuild in a fashion that provides devastated communities with a higher level of flood protection when the next hurricane strikes. In particular, we must quickly engage experts to consider ways to improve existing levees and other flood control infrastructure, seek opportunities to move vulnerable homes and businesses from harm's way, and begin the long overdue restoration of coastal Louisiana's vanishing wetlands and barrier islands.

Nothing less than the future of New Orleans and surrounding parishes is at stake. A meaningful rebuilding package must above all provide assurance that people and property will be secure in the future—or there is little hope that business and community leaders will invest in the region's future again.

To be successful, flood loss reduction efforts must be integrated—efforts to rebuild or expand levees must be integrated with decisions to build the diversions and pipelines needed to restore lost wetlands as well as local decisions to redevelop flooded neighborhoods.

Most importantly, Congress and the Corps of Engineers must treat flood protection and wetland restoration efforts with far greater urgency than we have in the past. Before Katrina struck, Congress and the corps envisioned that we could replace lost wetlands and barriers islands in decades, not years. Before Katrina, Congress and the corps envisioned we could provide a higher level of structural flood protection in decades, not years.

Today, in the wake of Katrina, every American recognizes the unique vulnerability of New Orleans and it surrounding parishes, and understands the role that Federal flood control and navigation projects have played in the loss of costal wetlands.

Every year, more than 25 square miles of Louisiana's coastal wetlands are lost because Mississippi River sediments that once spread out and replenished the river's coastal delta are now funneled into the Gulf of Mexico by Federal flood control levees and navigation training structures. More than 1 million acres of coastal wetlands—or 1,900 square miles—have been lost since 1930, and more than 300,000 acres of additional wetlands will be lost by 2050 if nothing is done. These wetlands and barrier islands play a critical role in the protection of our homes, businesses and critical infrastructure, reducing storm surge and absorbing wave energy.

One of the lessons reaffirmed by Katrina is that altering the natural movement of sediment and water often has severe unintended and unwanted consequences. Lining the Mississippi River with levees has reduced the flood threat posed by the river—but has, by contributing to the loss of coastal wetlands, made the flood threat posed by hurricanes far greater. Destroying 20,000 acres of wetlands that once acted as a natural hurricane barrier to create the Mississippi River Gulf Outlet has instead created what local officials call a "hurricane highway" that increased Katrina's storm surge by 20 to 40 percent and velocities more than three-fold.

Katrina also demonstrated that building levees to intentionally encourage development in harm's way—and using the projected "benefits" of induced development in these wetlands to help justify the construction of levees—have catastrophic consequences when these levees fail. To justify the Lake Pontchartrain and Vicinity Hurricane Protection Project, for example, the corps extended levees to the east of New Orleans to encourage the development of wetlands, according to a 1974 Corps report to Congress. Tragically, many of the homes built in these reclaimed swamps were filled to their rooftops when Katrina struck. Because so many Corps flood control projects induce development in harm's way, flood damages have more than tripled in real dollars in the past 80 years—even as the corps has spent more than $120 billion on flood control projects.

In the wake of Katrina, we also recognize the importance of subjecting costly or controversial water projects to independent review. Levee design failures—design failures that might have been detected by independent experts—and the "surge funnel" created by the Mississippi River Gulf Outlet contributed to this tragedy. According to Peter Nicholson, a civil engineering professor testifying on behalf of the American Society of Civil Engineers before the Government Affairs committee last week, the "funneling of the surge" into the MRGO and, ultimately, the Inner Harbor Navigation Channel caused widespread overtopping of levees. Other levees, according to Nicholson, experienced a wide range of damage that could be attributed to the materials used in their construction, "transitions" between different sections of levees, and "obvious soil failures within the embankment or foundation soils at or below the bases of the levees." In particular, three levee failures along the 17th Street and London Avenue canals were most likely caused by failures in the foundation soils underlying the levees, according to a preliminary report by the ASCE.

This is not the first time the Corps of Engineers has relied on faulty science, engineering or economics. The Government Accountability Office has in recent years found that Corps studies have overestimated the number of vessels that would use an expanded waterway, overestimated the number of vessels that would use an expanded inlet, overestimated the number of homes and businesses protected by an expanded levee, and largely failed to mitigate for the environmental impacts of completed projects. The Army's own Inspector General found that senior Corps leaders intentionally exaggerated the benefits of longer Mississippi River locks, and both the National Academy of Sciences and the Congressional Research Service concluded that Corps studies overestimated expected traffic on the river. Last year, the NAS called for sweeping reforms and modernization of the corps' project planning process, including independent review of many studies.

Until now, Congress and the corps have largely failed to address the corps' use of faulty science and economics, have largely failed to reform our flood control and insurance programs to discourage development in harm's way, and have largely failed to make the protection of population centers and critical infrastructure our highest civil works priority. Critical flood protection construction and maintenance have been delayed or abandoned so that the corps could build or maintain projects that return little benefit to the taxpayers. Projects designed to protect farm fields have received no greater priority than projects designed to protect people and critical infrastructure.

Corps spending in Louisiana illustrates this problem. Congress invested nearly $2 billion on Louisiana water projects over the past 5 years. But, much of these funds were invested in questionable projects that did nothing to avert the destructive impacts of Hurricane Katrina. While nationwide spending on the corps projects grew steadily during the past decade, from $3.2 billion in FY 1996 to $4.7 billion in FY 2005, annual spending on levees designed to protect New Orleans from a Category 3 storm declined from roughly $15 million a year to roughly $5 million a year, extending the project completion date for the city's structural hurricane protection project to 2015. A $12 million study to evaluate the benefits and costs of protecting New Orleans from a Category 5 storm has been delayed for years. This serious lack of prioritization is not limited to Louisiana. At the same time that the nation's civil works infrastructure faces a multibillion dollar backlog of critical maintenance needs, Congress continues to commit 30 percent of our waterway maintenance funding to waterways that carry approximately 3 percent of Nation's waterborne commerce.

OUR ORGANIZATIONS MAKE THE FOLLOWING RECOMMENDATIONS

First, Congress must act quickly to require the development of a comprehensive plan to raise existing levees, to relocate vulnerable structures, and to restore lost wetlands and barrier islands. This comprehensive plan should be developed by a team of hydrologists, scientists, and engineers, led by an independent commission

of three experts of national reputation appointed by the President after consultation with the Governor. An independent commission will reassure business leaders that efforts to improve our natural and man-made flood protection infrastructure will be undertaken quickly and competently. Promises of future funding will not provide business and community leaders with appropriate assurances.

The U.S. Army Corps of Engineers must play a central role in the design and construction of flood control and restoration projects, and we recommend that the commission be headquartered in the office of the Secretary of the Army. But, the commission should have the power to contract private engineering firms and institutions to supplement the corps' capacity and expertise. A task force of State and Federal officials should also be created to guide the commission's efforts.

Second, Congress should appropriate, in the next disaster supplemental, $5.5 billion to begin the restoration of lost coastal wetlands and barrier islands and $5 billion to enhance existing flood control infrastructure to protect New Orleans from a Category 5 storm. As you know, the corps and the State of Louisiana have already developed an ambitious, peer-reviewed plan to begin the construction of diversions, pipelines and other projects that will restore our natural hurricane protection system. Many of these critical restoration projects can be constructed immediately with no impact on traditional uses of the Mississippi and Atchafalaya rivers. Indeed, some restoration projects offer the chance to dramatically improve navigation on the Mississippi River and flood protection. A summary of these and other restoration opportunities is attached.

Third, Congress should immediately close the Mississippi River Gulf Outlet. Traffic on the MRGO has fallen by more than 50 percent since 1986. Today, less than one oceangoing vessel per day, on average, uses this man-made short cut, which costs approximately $13 million annually to maintain. Like many waterways constructed by the corps, the MRGO has failed to attract as much traffic as the corps predicted when the project was constructed. In fact, only 2 of 14 waterways constructed since World War II have attracted as much traffic as the corps predicted. Rather than rebuilding the levees along the MRGO, the corps should immediately close the channel and devise a plan to prevent salt water intrusion and ongoing channel erosion.

Fourth, Congress should reform FEMA mitigation and relocation programs to move flood victims from harm's way. Many flood victims would move their homes and business from harm's way, but current law requires State or local Government to share 25 percent of the cost of hazard mitigation—a requirement that no State or local agencies can meet in the wake of Katrina. Congress should waive the cost-sharing requirements for these hazard mitigation programs, and should reinstate FEMA's authority to use up to 15 percent of disaster assistance for these efforts.

Finally, Congress should reform the civil works planning process to ensure that urgent, worthy civil works projects are given the highest priority by the Administration and Congress.

To meet this goal, Congress should subject costly or controversial Army Corps projects to independent review and should require the corps to periodically update the Agency's planning tools to reflect the best available science and economics. Independent reviews could be undertaken at the same time as public review of draft studies, thereby ensuring that studies would not be delayed. Both of these reforms have been proposed by the National Academy of Sciences.

Congress should also direct the corps to meet State standards for the replacement of wetlands and other habitats destroyed by worthy water projects—that is, Congress should direct the corps to meet the same standards as private developers. The GAO recently found that the corps failed to mitigate for nearly 70 percent of the civil works projects constructed since 1986, when modern mitigation laws were enacted. Our failure to mitigate for impacts of public and private water projects in the past have set the stage for the damage wrought by Katrina.

Congress should direct an interagency council to establish priorities for the Nation's civil works spending. Although funds for the construction and maintenance of Army Corps water projects have steadily increased over the past decade to $4.7 billion annually, the backlog of authorized projects may soon exceed $70 billion. Many of these projects no longer address national priorities. Congress should direct an interagency council to set priorities for flood control spending so that scare resources are used to meet the nation's most critical flood damage reduction needs, to protect developed areas and critical infrastructure from flooding, to provide net economic benefits, and to avoid the needless destruction of wetlands and other environmental resources that serve as our first line of defense against hurricanes and floods. Critical flood control projects designed to protect people and public infrastructure should no longer take a back seat to projects designed to promote new development in frequently flooded floodplains.

As we rebuild, we must also prepare for the next hurricane. We must restore our coastal wetlands and barrier islands, but faster and with more urgency than has been proposed in the past. We must enhance our levees and other flood control infrastructure to protect New Orleans from a Category 5 storm. We must ensure that the Corps of Engineers uses the best available science and economics, subjected to independent review, to plan and prioritize future water projects. And, we must take steps to avoid the needless destruction of our natural flood reduction system.

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ATTACHMENT: CRITICAL RESTORATION OPPORTUNITIES

Based on our review of Army Corps and State planning documents and discussion with participating scientists, we propose immediate implementation of a series of projects and studies to begin the restoration of Louisiana's natural hurricane protection system. We recommend that Congress appropriate $5.5 billion in the next emergency supplemental appropriations bill for these projects and studies.

The Final LCA report issued by the U.S. Army Corps of Engineers and the State of Louisiana in November 2004, and the draft PEIS completed in 2003, identified likely projects but lacked the sense of urgency Katrina has shown is needed—many critical sediment and freshwater diversion and barrier island restoration projects and studies were postponed for decades. We believe it is possible to dramatically accelerate the design and construction of potential diversion, pipeline and barrier island restoration projects.

THE $5.5 BILLION IN NEAR-TERM FUNDING, ACCORDING TO OUR ANALYSIS, WOULD BE ALLOCATED AS FOLLOWS

• $3.1 billion to begin the restoration of coastal wetlands and barrier islands through a set of promising sediment pipelines and diversion projects east and west of the Mississippi River. These projects are described in more detail below.

• $1 billion for land acquisition, easements (including easements on cypress swamp forests) and the voluntary relocation of infrastructure, including the voluntary relocation of the service centers and small communities south of Pointe a la Hache. The voluntary relocation of some infrastructure will enhance opportunities to quickly restore lost coastal wetlands and reduce future flood losses.

• $1.115 billion to complete within 2 years the Mississippi River Delta Management Study proposed in the final LCA plan ($15 million), and to relocate the main shipping entrance to the Mississippi River so that this project can be implemented quickly if found to be feasible ($1.1 billion).

• $300 million to create a Science and Technology Program, a Demonstration Program, and to provide for beneficial use of dredged material, as envisioned in the final LCA plan.

• $45 million to complete studies of other potential pipelines and diversions that are not identified below, to complete large-scale feasibility studies within four years of the Atchafalaya River third outlet, the "Third Delta" concept, and the Chenier Plain Freshwater and Sediment Management and Allocation Reassessment.

In combination, these sediment and diversion projects and studies would quickly restore and nourish significant amounts of coastal wetlands near populated areas that need additional protection from storm surges as soon as possible. Construction of many diversion projects would also give managers the ability to operate different diversions under different flow conditions. We do not envision that all of these diversions would be operated simultaneously; rather, we envision that some diversions would be operated in some years and not other years.

The cost estimates in this memo are based upon the 2003 Draft PEIS and the 2004 final LCA plan.

Work at this rate will require engineering and scientific capability that would exceed the corps' existing resources. We therefore propose that the Administration ask Congress to create a three-member independent commission within the Department of the Army to oversee and accelerate restoration efforts. This Commission could contract not only with the corps and other Federal and State agencies and institutions but could also employ such mechanisms as private design competitions. To raise the profile and sense of urgency, we suggest that the Commissioners be appointed by the President following consultation with the Governor of Louisiana.

A SUMMARY OF PROPOSED PROJECTS FOLLOWS

• Sediment Pipelines—A series of sediment pipelines can be constructed east and west of the Mississippi River, including pipelines at Empire ($406M), Bastian Bay ($440M), American/California Bay ($593M), Myrtle Grove ($127M), and Quarantine

Bay ($734.9). These projects will rebuild lost wetlands in the shallow coastal bays that now abut the lowest reaches of the Mississippi River.

• Construct Diversions—A series of freshwater diversions of at least 50,000 cfs can be constructed to nourish highly degraded fresh to brackish wetlands in shallow open water areas east and west of the Mississippi River. These projects include diversions at Myrtle Grove ($143M), Fort Jackson/Boothville ($8M), Empire, Bastian Bay, American/California Bay ($15M), Caernarvon ($2M), and White's Ditch ($35M).

• Close the MRGO; Construct Sediment Pipelines—the corps should close the MRGO. Cost: $12 million. Pipelines and diversion should be constructed to rebuild wetlands north and south of the Mississippi River Gulf Outlet. Cost: $46.9 million and $25 million, respectively. the corps should also expand an existing diversion at Violet.

• Improve Freshwater and Sediment Flows Into Maurepas Swamp—Federal and State agencies should proceed with several projects to reverse the decline of Maurepas Swamp. They should build a diversion at Hope Canal, construct the Convent/Blind River diversion, and construct gaps in the existing dredged material banks of the Amite River Diversion Canal to improve water quality and introduce nutrients and sediments into western Maurepas Swamp. Cost: $10 million, $28 million, and $2.9 million, respectively.

• Construct Atchafalaya River Diversion—This project would convey Atchafalaya River water to northern Terrebonne Parish via an Avoca Island levee diversion. Cost: $132.2 million. Congress and the Administration should also reserve $500 million to move additional water and sediment east from the Atchafalaya River into the northern reaches of Terrebonne Bay.

• Bayou Lafourche Freshwater Diversion—This project would reintroduce flow from the Mississippi River into an existing bayou, reducing salinity levels and reducing loss rates between Bayou Lafourche and Terrebonne Bay. EPA, USACE, and other agencies should quickly assess whether this diversion project could be expanded to 5,000 cfs capacity or more without impacting infrastructure, and should quickly assess whether some infrastructure could be elevated or relocated. Cost: $75.2 million.

• Begin Barataria Barrier Shoreline Restoration—The project would mine offshore sediment source to reestablish barrier islands. The project would create a 3,000-foot-wide island, would restore critical portions of the original barrier island chain, and would aid the littoral movement of sediment to the remainder of the chain. Cost: $181 million.

• Begin Terrebonne Barrier Shoreline Restoration—This project would mine sediment to restore critical element of the barrier island chain, including Timbalier and Isles Dernieres barrier island chain. Cost: $84.8 million.

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STATEMENT OF STEVE ELLIS, VICE PRESIDENT, TAXPAYERS FOR COMMON SENSE

Good morning, thank you for inviting me here to testify. I am Steve Ellis, Vice President of Programs at Taxpayers for Common Sense, a national, non-partisan budget watchdog. First, I would like to commend the chairman and the committee for holding this series of hearings. I am confident that it will aid the committee as it develops the appropriate mix of water resource initiatives for the Gulf Coast and begins applying the lessons learned through Katrina and the other storms to our nation's water resource policy as a whole.

In the Gulf Coast area, we are faced with a significant challenge the need for speed, and the need to do it right. As a budget watchdog, I would add that we need to do it fiscally responsibly as well. The outpouring of individual support for the relief effort, which has already reached $2 billion, shows just how important this issue is to the nation.[1] We owe it to the American people to spend their tax dollars wisely on the relief effort, and to use that money to rebuild effectively and intelligently. Taxpayers have already spent $70 billion on relief to date, and we expect tens of billions more in the days to come.[2]

The fundamental responsibility of Government is to take care of its citizens. In the area of flood and storm damage reduction, it is clear that Government has failed. We spent $123 billion on flood control projects in the last century, but annual

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[1]Brennen Jensen and Elizabeth Schwinn. Chronicle of Philanthropy. "Donations to Hurricane Relief Exceed $2 Billion, But Costs Soar." November 3, 2005. Available at http://philanthropy.com/free/update/2005/11/2005110302.htm.

[2]Senate Budget Committee Republican Staff. Budget Bulletin. October 4, 2005. Available at http://budget.senate.gov/republican/analysis/2005/bb08-2005.pdf.

costs from flood damage have increased from $2.6 billion annually in the first 50 years of the 20th century to more than $6 billion per year over the last decade.[3]

Right after Katrina flooded New Orleans, the airwaves were full of Army Corps of Engineers officials stating that the levees and floodwalls performed as expected they provided category 3 protection and Katrina was a category 4 storm. But according to recent testimony, Katrina was no longer a category 4 hurricane when it hit New Orleans. Engineering panels sponsored by the National Science Foundation and the American Society of Civil Engineers found that the levees and floodwalls did not perform to design or promise. Additionally, these experts raised concerns that there may have been possible malfeasance on the part of individuals constructing flood control structures.[4]

This initial analysis should send shivers down all of our spines. If it is true that the levees were brought down by shoddy craftsmanship, we need to know whether this was an isolated case, or whether this is just one of many projects nationwide that we should be concerned about.

We also need to learn more about the assumptions that Corps officials made when constructing and maintaining the London Street, 17th Street and Industrial Canal flood protection projects, and we should take a good look at how construction was supervised. In one of my jobs with the Coast Guard, I served as the Contracting Officer's Technical Representative for a boat construction contract. In that capacity, I learned that inspection and oversight is as important as the initial construction itself. the corps' failure to oversee and predict the vulnerabilities in New Orleans flood protection is quite possibly the most troubling incident in the Agency's recent history.

So where do we go from here. Here are a few principles that TCS would urge the committee, Congress and the administration to consider regarding rebuilding water infrastructure in the Gulf Coast and learning from Katrina.

- Rethink the level of protection-Everyone agrees that we must give New Orleans at least the category 3 level of protection that it was supposed to have before Katrina. However, we cannot expect any levee to automatically meet all our needs just because the corps has deemed it "category 3," or even "category 5." Hurricanes are extremely dynamic entities. We should endeavor to obtain significant protection from a variety of threats, not just a repeat of Katrina.
- Identify what to rebuild-Although it will be difficult process, we will have to identify areas that are too damaged or so vulnerable to future storms that they should not be rebuilt. Just like after the Great Midwest Flood of 1993, this is a tough task that should be managed and led by Louisianans. But the Federal Government needs to be clear that if individuals want to rebuild in hurricane-ravaged areas, they should do it without the aid or encouragement of Uncle Sam. In past crises, some affected towns have responded by relocating out of the floodplain.[5] After the Flood of 1993, the post-event analysis recommended that damaged communities should move critical infrastructure out of the floodplain where possible.[6] When floodwaters returned in 1995, the damage was far less.[7] If relocation is not practical, infrastructure and densely populated areas should have the highest level of flood protection possible. This strategy makes sense, but we also have to realize that Mother Nature is very creative, versatile and powerful. We can mitigate the risks with levees, floodwalls and constructed wetlands, but the risk of catastrophic flood damage will always be there.
- Reevaluate our policies-The potentially shoddy levee construction in New Orleans should not be all that concerns us regarding levees. Our Nation's water resource policies are antiquated and often fail to adequately protect us. The Principles and Guidelines—the rules governing Corps of Engineers project design and selection—are more than two decades old. We need to update these rules to fully account for all costs and benefits of Corps projects, modernize economic procedures and remove biases toward large construction projects.

We have a $58 billion backlog of Corps of Engineers projects and the Agency has a roughly $5 billion budget. Rather than pumping up the corps budget as some in-

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[3]Taxpayers for Common Sense and National Wildlife Federation. Crossroads: Congress, the Corps of Engineers and the Future of America's Water Resources. March 2004. 20-21.

[4] Senate Homeland Security and Governmental Affairs Hearing. Hurricane Katrina: Why Did the Levees Fail? November 2, 2005.

[5]Jeanne Cummings. The Wall Street Journal. "Swept Away: How Rhineland, MO, Saved Itself but Lost a Sense of Community." July 15, 1999.

[6]Interagency Floodplain Management Review Committee. "Sharing the Challenge: Floodplain Management Into the 21st. Century". June 1994.

[7]Federal Emergency Management Agency. "Success Stories from the Missouri Buyout Program". August 2002.

sist, we must establish a system of prioritizing project investment so we don't squander precious tax dollars maintaining waterways with no traffic, rather than constructing essential flood damage reduction projects.

National flood policies also make little sense. Our 35-year experience with flood insurance has failed: FEMA estimates that flood insurance claims this year will exceed $22 billion, but the National Flood Insurance Program has the capacity to pay about $2 billion per year.[8] Further, our policies discourage adequate flood protection. Since the typical homeowner does not have to buy flood insurance if they have 100-year flood protection, we have essentially dumbed down our flood protection to the 100-year level. Remember, there is still a 1 percent chance that these areas would flood every year; people buy lottery tickets hoping to win with far worse odds than that. The convention of describing the level of protection by assigning it an x-year level, be it 50-, 100-, or 500-year, is confusing and leaves individuals with an unrealistic view of their protection.

• Let the economy help itself-Many private sector industries are now pleading with the Government to help them rebuild. Small businesses, the oil and gas industry, fishing industry, the port—all are seeking significant Federal support to get them back on their feet. We strongly urge the incentives to be small, targeted and short in duration. Katrina was an unthinkable tragedy, but it also provides an opportunity to let the market correct the mistakes of the past. For instance, some businesses or infrastructure may have been inappropriately located, at high risk from storms. Taxpayers should not subsidize them to be built right back in harm's way. The Federal Government should be trying the rev the Gulf Coast's economic engine, but if the Government's hand or handout is too heavy it will stifle innovation and economic incentives to reduce exposure to storm risk.

• Forward thinking-There are a lot of plans on the books for providing adequate flood protection for New Orleans and Louisiana. We must resist the urge to simply dust them off and get building. Our approach to providing adequate protection must be integrated and multi-faceted, and it must be tailored to include the lessons learned from this unthinkable tragedy. Our planning must be dynamic and we have to think outside the box, because traditional approaches will likely not succeed. We should look at ideas like Dr. Sherwood Gagliano's plan to divert some of the Mississippi River water and sediment to restore coastal marshes. This plan was highlighted in the Wall Street Journal recently.[9] Furthermore, we need to make policy changes that will help provide the smarter floodplain development and protection incentives.

• Don't try to do everything-Congress has already been asked to fund the "do everything for everyone" approach. We shouldn't try to rebuild everything that was damaged by Katrina because the regions that were hit were obviously very exposed to storm damages. Funding and activity must be targeted to accelerate, but not dictate the rebuilding process. The Federal role in rebuilding will set precedents for future natural disaster response, so we must be judicious in our activities.

That gets me to major concern for Taxpayers for Common Sense-cost. The Nation needs to set some investment priorities in the Gulf Coast region. We cannot afford to protect everything, everywhere and pay everyone to come back to New Orleans. We had a $317 billion budget deficit last year. We are fighting a war. New Orleans is an important and valuable investment, but we have to target our funding wisely.

Thank you very much for inviting me here to today to testify and I'll be happy to answer any questions you might have.

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RESPONSES BY STEVE ELLIS TO ADDITIONAL QUESTIONS FROM SENATOR JEFFORDS

*Question 1.* Mr. Ellis, can you give me your perspective on how we can balance the need to preserve historic structures and the need to ensure that the people affected by this disaster are able to meet their basic needs of food, clothing and shelter?

Response. Preserving historic structures in New Orleans is a laudable and important goal. However, meeting citizen's needs for food, clothing and shelter is obviously of the utmost importance. Part of New Orleans charm and attraction as a tourist destination is the architecture and historic buildings. If we are to maintain a stable economy in the region we cannot simply raze flood damaged historic structures and replace them with quickly built housing. As we rebuild New Orleans we

[8]David I. Maurstad, Acting Director and Federal Insurance Administrator, Mitigation Division, Federal Emergency Management Agency. Testimony before the House Committee on Financial Services. October 20, 2005.

[9]Betsy McKay. The Wall Street Journal. "Moving the Mississippi". October 29, 2005

must endeavor to replicate the character and the style that made this town one of the most culturally rich cities in the country. Further, we are going to have help citizens and organizations to rebuild and rehabilitate damaged buildings while providing for the displaced citizens.

*Question 2.* During the stakeholders meeting we held in this committee, and during last week's hearing with Mayor Nagin, one of the major points was that local redevelopment plans must drive Federal investments. For example, it may be possible to redevelop the city in such a manner that the highest levels of flood control are not required everywhere. The Mayor and the Governor both have planning processes underway. I realize that time is of the essence in rebuilding, but you don't want to spend huge amounts of resources rebuilding flood control in an area where no one is going to live. Can you give me your impressions of how this process is proceeding?

Repsonse. The President and others have supported funding for greater levee protection. We agree. We need to convince the residents that the Federal Government will commit to providing greater levee protection in the neighborhoods where it makes sense to rebuild. But, we have to recognize that because time is of the essence we could be rebuilding flood protection in some areas where it may not be necessary after full redevelopment plans are enacted. Also, in some places the immediate flood protection that we provide may have to be rebuilt or expanded in the future. The rebuilding of flood control and drafting of redevelopment plans is, like much of the rebuilding process, stumbling forward. I am not aware of a clear redevelopment plan or a flood protection plan beyond the U.S. Army Corps of Engineers proposal to rebuilding the pre-Katrina flood protection.

*Question 3.* Mr. Ellis, given the preliminary conclusions of the different groups conducting a failure analysis of the flood control projects in New Orleans, can you describe your view on how the need to provide flood control for the next hurricane season should be balanced against the need to find out exactly what happened so that the corps does not rebuild ineffective flood control?

Response. As quickly and accurately as possible, we need to determine how exactly our flood protection structures performed during Katrina, what failed and why. Because initial reviews are suggestion human error and "negligence" is to blame, the review process will be integral to inform our rebuilding process as it goes forward. Lessons learned by the engineering teams need to be applied tomorrow; we cannot afford to wait until the entire review is signed, sealed and delivered.

*Question 4.* On November 9, 2005, the NAS released a report on the coastal Louisiana restoration plan. One of its major recommendations echoes themes we have heard about local redevelopment plans—they recommend the development of an explicit map of the expected future landscape of coastal Louisiana. Without this, it will be difficult to move forward with coastal restoration and flood control in a targeted manner. Can you give me your response to this recommendation and your thoughts on how it should be implemented in Louisiana.

Response. We have to have a realistic vision of our future New Orleans and coastal Louisiana if we are to ever build a responsible, integrated system to protect it. I said "realistic" vision, because we have to recognize that these areas are always going to be vulnerable to Mother Nature and that we must be cognizant that a direct hit from a category five storm will wreak tremendous damage no matter what our defenses are. If something—critical infrastructure, dense population center—doesn't have to be in harm's way, we should relocate it. If it has to stay, then we should provide it the highest level of protection possible. We cannot afford to simply be beholden to development decisions from the past; they may no longer be relevant or even dangerous. Led by Louisianans, difficult decisions are ahead in this process and will have to be made.

*Question 5.* One of the key themes we have heard is that cost-benefit analysis procedures should be revised—most significantly to account for potential loss of life. What are your views on the revision or abandonment of cost-benefit analysis as a decision-making tool for the corps?

Response. The discussion of abandoning the cost-benefit analysis because of its shortcomings is akin to "throwing the baby out with bath water." It makes little sense to not conduct a benefit-cost analysis before investing billions of taxpayer dollars. What we must do is modernize that analysis to include—as best as possible—all of the costs and benefits associated with Corps projects. In too many cases some of the benefits and costs: social and economic, were simply left out the equation. We cannot afford to do that. Incorporating the potential cost of loss of life will be difficult. Rather than trying to attach a dollar figure, which would be controversial and heavily bias analysis results, we should instead increasingly prioritize projects that

significantly protect against loss of life. In the end benefit-cost analysis should be a dynamic entity that evolves as economics and the Nation's needs evolve.

*Question 6.* Given the corps' experience in Hurricane Katrina, can you tell us if you believe that the Federal Government should do more to ensure the safety of our Nation's levee program? For example, should safety standards and an inspection regime be established?

Response. We absolutely need to establish a system to a) ascertain the safety of existing levees around the country; b) determine whether the levees provide the appropriate level of protection, some levees may be no longer necessary, others may need to be strengthened, a benefit-cost analysis should be performed; c) develop national safety and design criteria for levees; and d) create a system to regularly inspect levees and other flood protection.

*Question 7.* There has been much discussion of the Mississippi River Gulf Outlet and the effect it had in magnifying the storm surge that reached New Orleans. Can you give me your specific recommendations regarding this Outlet in light of what happened during Katrina?

Response. The Mississippi River Gulf Outlet (MRGO) should be closed immediately. It accommodates very little traffic to justify its existence and clearly creates a significant hazard for New Orleans and neighboring parishes. This is a case where a fair cost-benefit analysis would reveal the project to be a loser. Enormous potential costs in death and destruction and very little economic benefit. One idea that has been offered is to reduce the outlets draft and construct a vessel floodgate and storm surge barriers. This makes virtually no sense. We are going to spend an enormous amount of money to keep the outlet open when it has already proven to be an economic loser. Furthermore, part of this plan is to deepen, widen and lengthen the lock on the Industrial Canal (Inner Harbor Navigational Canal) to allow traffic to access the few port facilities served by the MRGO. So, when New Orleans, the Gulf Coast and the nation is scrambling for cash we are going to spend more than a billion dollars wasteful navigation schemes to keep MRGO open. That makes no sense. The outlet should be closed, a restoration project along it should be started and the new lock on the Industrial Canal should be deauthorized.

## *Broken Levees: Why They Failed*[1]

The failure of the levees in New Orleans was catastrophic for the city and for its most vulnerable citizens. In the aftermath of Hurricane Katrina, it is important to understand why the levees failed and what actions, had they been taken, would have prevented, or reduced, the flooding of New Orleans.

The failure of the levees was not just predictable; it was predicted. Scientists have warned for years that a strong storm could breach the levees. Likewise, efforts to make New Orleans safer go back years. In 1965, Congress authorized the Corps of Engineers to improve hurricane protection for New Orleans. The Corps considered two options, pursued one of them for a while, and then changed to the second option. Neither project, however, was designed to protect New Orleans from more than a category 3 hurricane. Thus, neither option was intended to save New Orleans from a hurricane like Katrina.

The failure to protect New Orleans resulted from an inadequate plan by the Army Corps of Engineers to save the city and from the failure of federal government to fund badly needed improvements in that plan. The Corps also constructed a little used ship canal through the middle of New Orleans that made the city considerably more vulnerable to the flooding that occurred.

Right-wing pundits and politicians, however, have attempted to blame the flooding on environmental litigation that temporarily halted the Corps from pursuing the first option.[2] They argue that if the law suit had not been initiated, the Corps would have been able to complete the first option and the city would therefore have been better protected. As this report documents, these claims are wholly unfounded. It is beyond dispute that the litigation would have only temporarily delayed the Corps from pursing option one had it chosen to do so. In the process of responding to the lawsuit, however, the Corps decided to switch to the second option because it believed that one represented the better policy. This switch also responded to the widespread local public opposition to the first option. In any case, the first option would not have prevented the flooding in New Orleans even if it had been completed. Neither the first or second option was designed to protect New Orleans from more than a category 3 hurricane. Moreover, the first option, had it been completed, would not have stopped the flooding that occurred along the ship canal.

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[1] This Special Report was prepared by Center for Progressive Reform scholars Donald T. Hornstein, Douglas A. Kysar, Thomas O. McGarity, and Sidney A. Shapiro. For more information, contact CPR's media office at mfreeman@progressivereform.org. Visit CPR on the web at www.progressivereform.org.

[2] See, e.g., R. Emmett Tyrell, Jr., Eco-Catastrophe Echoes, *Washington Times*, September 16, 2005; John Berlau, Greens vs. Levees, *National Review*, Online, September 8, 2005, available at http://www.nationalreview.com; You Can Pay Me Now, or You Can Pay Me Later, *The Quando Blog*, available at http://www.quando.net/details.aspx?Entry=2595.

### *We Knew This Would Happen*

Not long after the levees broke and water from Lake Pontchartrain on the north and Lake Borgne on the east began to fill New Orleans, President Bush's told television correspondent Diane Sawyer that no one could have foreseen the breach of those levees.[3] In fact, over a period of many years, scientists had predicted that a strong storm could breach the levees. Scientists especially feared that even a relatively weak storm coming from the right direction would push a wall of water into the heart of New Orleans from Lake Borgne through the funnel-shaped Mississippi River Gulf Outlet canal and into the Industrial canal, destroying the levees along the canal and flooding much of St. Bernard Parrish and the Lower Ninth Ward. It now appears that this is exactly what happened.[4]

The President's comments were addressed to the question of the adequacy of huge and complex levee system that surrounds New Orleans and makes the continued existence of that city possible. Hurricane Katrina may have been an act of Nature, but the levees and associated flood protection systems that are an indispensable part of the infrastructure of New Orleans and surrounding areas are clearly the works of human beings. And the level of protection afforded by the New Orleans flood control apparatus is primarily a function of the level of resources, political will, and competence that federal and state governments applied to planning, construction, and maintenance of that system. In short, the security provided by the levee system and associated protections have always been the responsibility of government, and the government failed to fulfill its responsibility.

### *Overview of the Levee System*

There are three flood risks in New Orleans. Because New Orleans is situated in the delta formed at the mouth of the Mississippi River, it has always maintained a flood control system in place to protect it from the risks of flooding from the river to the south, Lake Pontchartrain to the north and Lake Borgne and the Gulf of Mexico to the east.[5]

There is a risk of flooding from the Mississippi River because of flood waters coming down the Mississippi River from rainfall occurring hundreds of miles to the north. The primary line of defense against river flooding is an extensive system of levees and dikes that extends along the length of the river. That system, which contains the city's highest levees, averaging 25 feet above sea level in height, was not involved in the Hurricane Katrina disaster. Claims that environmental litigation involving the Mississippi River levees caused the New Orleans floods are therefore uninformed and unfounded.[6]

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[3] Dan Froomkin, White House Briefing: A Dearth of Answers (Sept. 1, 2005), available at http://www.washingtonpost.com/wp-dyn/content/blog/2005/09/01/BL2005090100915.html?nav=rss_politics.
[4] Michael Grunwald, Canal May Have Worsened City's Flooding, *Washington Post*, September 14, 2005, at A21.
[5] Mark Fischetti, Drowning New Orleans, *Scientific American*, October 1, 2001.
[6] See, e.g., R. Emmett Tyrell, Jr., Eco-Catastrophe Echoes, *Washington Times*, September 16, 2005; John Berlau, Greens vs. Levees, *National Review*, Online, September 8, 2005, available at http://www.nationalreview.com

New Orleans is protected from Lake Pontchartrain and Lake Borgne, which are located almost side-by-side on the north side of New Orleans, by an interconnected series of levees that extends along the lakes. (A map of the lakes and levees by the *Times Picayune* can be found at http://www.nola.com/hurricane/popup/nolalevees_jpg.html.) These levees are considerably smaller than the ones that protect New Orleans from flooding of the Mississippi. They range from 13.5 to 18 feet above sea level in height.

Another series of somewhat lower levees provides protection to Eastern New Orleans and St. Bernard Parish, which are located to the north and east of New Orleans, from Lake Pontchartrain on the north and from Lake Borgne and the Gulf on the west. Parts of the parish are located between the two lakes.

Because New Orleans is below sea level and rapidly sinking, rainwater that flows into the city must be removed not by natural drainage, but with huge pumps that force the water to move along three man-made canals, called "outfall canals," to Lake Pontchartrain. The canals are lined with concrete walls that prevent the water from spilling into the city. Water flowing through the canals is nearly as high as the rooftops of some houses adjoining the canals.[7] All of the levees were built by the Corps of Engineers and are maintained by various local levee districts.[8]

In addition to the drainage canals, the Corps of Engineers constructed two very large canals to permit ocean-going vessels to move from the Mississippi River through the city to Lake Pontchartrain or the Gulf of Mexico to the south of Lake Borgne. The Industrial Canal slices north/south across the city between the river and the lake at the point where they are closest to each other. The Mississippi River-Gulf Outlet (MRGO) canal bisects the Industrial Canal and travels east/west to the Intracoastal Canal near Lake Bourne. The shipping canal levees consist of concrete floodwalls and earthen levees.

### *Levee Planning and Construction*

In the wake of Hurricane Betsy, which struck in September 1965, Congress authorized a massive hurricane protection improvement effort called the Lake Pontchartrain and Vicinity Hurricane Protection Project (LPVHPP) to provide hurricane protection to the Greater New Orleans metropolitan area.[9] To implement this statute, the Corps of Engineers studied two major options -- the "high level" option and the "barrier" option.

#### The High Level Option

The "high level" option consisted simply of raising all of the existing levees and, where necessary, constructing new high level levees to a height that would prevent flooding

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[7] First Line of Defense: Hoping the Levees Hold, available at http://www.nola.com/hurricane/popup/nolalevees_jpg.html.
[8] Id.
[9] Hearings on Hurricane Protection Plan for Lake Pontchartrain and Vicinity before the Subcommittee on Water Resources of the House Committee on Public Works and Transportation, 95th Cong., 2d Sess. (1978) [hereinafter cited as 1978 House Hearings], at 20 (testimony of Colonel Early J. Rush III).

that could result from the "standard project hurricane," a mythical hurricane that was designed to simulate a hurricane that would hit New Orleans once every 200 to 300 years.[10] Although the Corps later determined that the model hurricane was impossible, it was roughly equivalent to a fast moving category 3 storm on the Saffir-Simpson hurricane scale.[11] In practice this would have resulted in raising the levees from between 9.3 and 13.5 feet above sea level to between 16 and 18.5 feet above sea level.[12]

The Barrier Option

Under the "barrier" option, the Corps was to construct levees along the far eastern edge of Lake Pontchartrain where it flows into Lake Borgne and the Gulf of Mexico through two relatively narrow channels at the Rigolets and Chef Menteur. The Corps was supposed to construct huge structures at the two passes that would allow water to flow back and forth between the lakes but could be closed as a hurricane approached. The Corps believed that the levees and the barrier structure would prevent the storm surge preceding the hurricane from crossing from Lake Bourne into Lake Pontchartrain.[13] Like the high level option, the barrier option was designed to protect against the standard project hurricane, a hypothetical hurricane that was the equivalent of a fast moving Category 3 hurricane.

First Choice: The Barrier Option

The high option had several drawbacks, including the need to obtain rights of way for additional land near the levees to allow them to be widened so that they could be raised. In addition, the high level plan would not prevent the flooding of the industrial areas that were located outside the levees.[14] The Corps therefore decided to implement the barrier option, and construction began on floodwalls along the east and west sides of the Industrial Canal in 1967.[15]

To speed the project along, the Orleans Levee Board financed and constructed portions of the floodwalls, and this relative inexpensive aspect of the project was virtually completed by 1973.[16] Work on the barrier structures and levees running from New Orleans to the those structures, however, was greatly delayed because landowners opposed to the project demanded high prices for the property that the Corps needed for those levees, forcing the Corps to exercise its power of eminent domain.[17]

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[10] 1978 House Hearings, supra, at 21 (testimony of Colonel Early J. Rush III).
[11] Jerry Mitchell, E-Mail Suggests Government Seeking to Blame Groups, Mississippi *Clarion-Ledger*, September 16, 2005, at A1 (quoting Corps of Engineers spokesperson John Hall); John McQuaid & Mark Schleifstein, Evolving Danger, New Orleans *Times-Picayune*, June 23, 2002, at J12.
[12] United States General Accounting Office, Cost, Schedule, and Performance Problems of the Lake Pontchartrain and Vicinity, Louisiana, Hurricane Protection Project (PSAD-76-161 (August 31, 1976) [hereinafter cited as 1976 GAO Report], at 3.
[13] 1978 House Hearings, supra, at 22 (testimony of Colonel early J. Rush III).
[14] Id. at 21 (testimony of Colonel early J. Rush III).
[15] The Orleans Levee District -- A History, available at http://www/orleanslevee.com/history.htm [hereinafter cited as Levee District History]
[16] Id.
[17] 1976 GAO Report, supra, at 16.

In 1976, a coalition of local fishermen and an environmental group called Save Our Wetlands sued the Corps of Engineers alleging that the final environmental impact statement (FEIS) for the project was inadequate.[18] On December 30, 1977, a federal judge issued an injunction preventing the Corps from conducting any work on the barrier project until it had prepared an adequate FEIS. The injunction was subsequently modified to permit continued construction of the levees between the lake and the City of New Orleans.[19]

Second Choice: The High Level Plan

The lawsuit temporarily prevented the Corps from doing further work on the barrier option, but the Corps abandoned this option for other reasons. When the injunction sent the Corps back to the drawing board, it reconsidered the costs and benefits of the barrier and high level options. At the same time, it was encountering strong opposition to the barrier plan from local citizens who did not want to pay a very high price for a project that might endanger the vitality of Lake Pontchartrain and from representatives of areas on the Lake Borgne side of the barrier who would have been at greater risk of flooding during hurricanes.[20]

The intense public opposition was in evidence in congressional hearings conducted in New Orleans the week after the injunction issued. A spokesperson for the League of Women Voters argued that the Corps had never undertaken a study of the cost to taxpayers of maintaining the urbanization of wetlands that the project envisioned, and she noted that the voters of New Orleans had defeated proposals to participate in the financing of the barrier project on three separate occasions, but had voted to approve a similar project without the barriers the previous year.[21] An informal poll conducted by Representative Robert Livingston indicated that a substantial majority of the New Orleans citizens either opposed the project (38.5 percent) or favored discontinuation until the studies could be completed (23.6 percent).[22] Not known for his antipathy to federally financed public works projects in his district, Representative Livingston expressed considerable reservations about the wisdom of this particular project. The state representative from St. Tammany Parish, part of which was on the Lake Borne side of the barrier project warned that the project would put his parish at risk when the gates were closed because it would deflect the surge from Lake Bourne into St. Tammany parish.[23]

By 1982, the New Orleans district of the Corps of Engineers had changed its mind and favored the high level plan "because it would cost less than the barrier plan" and "have fewer detrimental effects on Lake Pontchartrain's environment."[24] One of the factors underlying the changed cost assessment was no doubt the escalating cost of acquiring rights of way from

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[18] Levee District History.
[19] Id.
[20] See discussion of the opposition below.
[21] 1978 House Hearings, supra, at 11 (testimony of Charlotte H. Nelson).
[22] 1978 House Hearings, supra, at 12.
[23] 1978 House Hearings, supra, at 47-48 (testimony of Edward G. Scogin).
[24] United States General Accounting Office, Improved Planning Needed by the Corps of Engineers to Resolve Environmental, Technical and Financial Issues on the Lake Pontchartain Hurricane Protection Project (GAO/MASAD-82-39 (August 17, 1982), at 2.

property owners who opposed the barrier project.[25] The Corps did not make a final decision on how to proceed until 1985 when it decided to implement the high level plan because by then it was considerably less expensive. The high level plan of 1985 was substantially completed prior to Hurricane Katrina and repair and maintenance projects along the levees and floodwalls were ongoing.[26]

### *Why the Levees Failed*

Lake Pontchartrain

The water that flooded New Orleans did not flow over the high level levees situated between the lake and the city. Instead, it appears that the surge flowed up the 17th Street and London Avenue canals and caused one breach of the floodwall along the 17th Street canal and two breaches of the floodwall along the London Avenue canal.

The floodwalls along the two "outlet" canals were breached even though they had recently been remodeled. The Corps had enhanced these floodwalls pursuant to the "high level" hurricane protection plan. In the aftermath of the storm, the Corps of Engineers stressed that the two specific outlet levees that had breached were "fully completed" and not on the list of unfunded projects.[27]

Nevertheless, the breach should have been anticipated. The hurricane protection plan that was implemented after 1985 was designed to protect the city against the "standard project" hurricane that roughly corresponds to a fast-moving category 3 storm. Scientists had for years prior to the storm predicted that the levee system could not withstand a Category 4 or Category 5 storm.[28] Hurricane Katrina struck the Louisiana/Mississippi coast as a Category 4 storm.

Lake Borgne

Although the Corps enhanced the levees protecting Eastern New Orleans and St. Bernard Parish as part of the high level plan, these areas were not protected from the "end around" exposure that occurred during Hurricane Katrina. The hurricane surge entered Lake Borgne from the Gulf of Mexico and proceeded up the MRGO canal to the Industrial canal in the heart of New Orleans. Hurricane Katrina appears to have destroyed as much as 90 percent of the levees and flood walls along the MRGO canal in St. Bernard parish as it pushed up the narrowing canal from Lake Borgne to the conjunction of the MRGO canal with the Industrial canal. Colonel Richard Wagenaar, the Corps' head engineer for the New Orleans district,

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[25] 1976 GAO Report, supra, at 16.
[26] Levee District History, supra.
[27] Andrew Martin & Andrew Zajac, Flood-Control Funds Short of Requests, *Chicago Tribune*, September 1, 2005, at 7.
[28] Jerry Mitchell, E-Mail Suggests Government Seeking to Blame Groups, Mississippi *Clarion-Ledger*, September 16, 2005, at A1 (quoting Corps of Engineers spokesperson John Hall); John McQuaid & Mark Schleifstein, Evolving Danger, New Orleans *Times-Picayune*, June 23, 2002, at J12.

reported that the eastern levees were "literally leveled in places."[29] That same surge probably caused the breaches in the floodwalls along the Industrial canal.

The MRGO canal, which was completed in 1968, is a deep draft seaway channel that extends for approximately 76 miles east and southeast of New Orleans into Breton Sound and the Gulf of Mexico. It was designed to shorten the distance for ships from the eastern shipping lanes of the Gulf to New Orleans, but it has never lived up to its economic expectations. Less than three percent of the New Orleans port's cargo traffic uses the MRGO; this amounts to less than one ship per day.[30] According to one estimate, the government spends $7 million to $8 million per year (about $10,000 for every large vessel that uses the canal) just to maintain the canal.[31]

This very scenario was predicted long before Hurricane Katrina struck. In 2002, the Corps of Engineers acknowledged that "[t]he MRGO levee is more likely to be affected than the area in the lake itself."[32] Proponents of closing the canal pointed out that, with the erosion of the wetlands in the unleveed stretches south and east of the city, it had "evolved into a shotgun pointed straight at New Orleans."[33]

More recently, Professor Hassan Mashriqui of Louisiana State University undertook an extensive modeling exercise of the "shotgun" scenario.[34] Professor Mashriqui warned that the MRGO created a "funnel" that would direct a storm surge from Lake Bourne to the Industrial Canal with resulting destruction of flood walls along that canal.[35] Satellite images and Corps of Engineers flyovers confirmed that the storm surge destroyed levees along the MRGO canal in a way that was entirely consistent with Professor Mashriqui's model, and it is likely that the same surge destroyed portions of the floodwall along the Industrial Canal.[36] G. Paul Kemp, an oceanographer at the LSU Hurricane Center, agreed that the MRGO "funnel" was "a back door into New Orleans," and he had little doubt that it "was the initial cause of the disaster."[37] In addition to its potential to channel hurricane surges into the heart of New Orleans, the MRGO canal has over the years severely eroded the wetlands south of New

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[29] Ralph Vartabedian, Much Wider Damage to Levees Is Disclosed, *Los Angeles Times*, Sept. 13, 2005, available at http://www.latimes.com/news/nationworld/nation/la-na-corps13sep13,0,5962987.story?coll=la-home-headlines.

[30] Michael Grunwald, Canal May Have Worsened City's Flooding, *Washington Post*, September 14, 2004, at A21.

[31] Lake Pontchartrain Basin Association, Martello Castle Background Information, available at http://wetmaap.org/Martello_Castle/Supplement/mc_background.html [hereinafter cited as Martello Castle Background Information].

[32] Jerry Mitchell, E-Mail Suggests Government Seeking to Blame Groups, Mississippi *Clarion-Ledger*, September 16, 2005, at A1 (quoting Corps of Engineers spokesperson John Hall); John McQuaid & Mark Schleifstein, Evolving Danger, New Orleans *Times-Picayune*, June 23, 2002, at J12.

[33] John McQuaid & Mark Schleifstein, Evolving Danger, New Orleans *Times-Picayune*, June 23, 2002, at J12.

[34] Michael Grunwald, Canal May Have Worsened City's Flooding, *Washington Post*, September 14, 2004, at A21.

[35] Id.

[36] Id.

[37] Id.

Orleans.[38] In 1998, the St. Bernard parish Council unanimously passed a resolution demanding that the MRGO be closed.[39]

### *Why New Orleans Was Not Better Protected*

Not a National Priority

The vulnerability of New Orleans to a catastrophe were well known and widely predicted, yet recent efforts to enhance the protection of New Orleans from Lake Pontchartrain have floundered. An attempt in 1996 to re-evaluate the Lake Pontchartrain levees broke down in disputes over modeling and other bureaucratic disagreements.[40] More recently, the Bush Administration rejected a Corps of Engineers request for $27 million to pay for hurricane protection projects along Lake Pontchartrain and proposed a budget of only $3.7 million. Congress ultimately appropriated $5.7 million for the projects, but the Corps still had to delay seven levee improvement contracts.[41]

Joseph Suhayda, an Emeritus Professor of Engineering at LSU, observed that the part of the 17th Street floodwall where a recent breach occurred was four feet lower than the rest of the floodwall. He believes that "they could have significantly reduced the impact" of Hurricane Katrina if the improvement projects had been fully funded.[42] The chief of engineers for the Corps, however, responded that had the pending projects "been fully complete," flooding of the business district and the French Quarter would still have resulted from the intensity of the storm.[43]

Mike Parker, a former Republican Congressman from Mississippi who was until 2002 the chief of the US Army Corps of Engineers, was forced to resign when he publicly stated to the Senate Budget Committee that the national interest was being harmed by President Bush's proposal to cut over $2 billion from the Corps' $6 billion budget.[44] After Hurricane Katrina struck, Mr. Parker added that President Bush had not adequately funded improvements to the very levees in New Orleans that had been breached; indeed, Mr. Parker stated that had full funding been authorized "there would have been less flooding than you have."[45] An official Corps of Engineers memo dated May 2005, long after Parker left the agency, seemed to corroborate this possibility. It stated that the Bush Administration's

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[38] Martello Castle Background Information, supra.
[39] Michael Grunwald, Canal May Have Worsened City's Flooding, *Washington Post*, September 14, 2004, at A21.
[40] John McQuaid & Mark Schleifstein, Evolving Danger, New Orleans *Times-Picayune*, June 23, 2002, at J12.
[41] Andrew Martin & Andrew Zajac, Flood-Control Funds Short of Requests, *Chicago Tribune*, September 1, 2005, at 7.
[42] Id.
[43] Id. See also Michael Grunwald, Money Flowed to Questionable Projects, *Washington Post*, September 8, 2005, at A1.
[44] John McQuaid & Mark Schleifstein, Shifting Tides, New Orleans *Times-Picayune*, June 26, 2002, at 14.
[45] Andrew Martin & Andrew Zajac, Flood-Control Funds Short of Requests, *Chicago Tribune*, September 1, 2005, at 7.

funding levels for fiscal years 2005 and 2006 were not enough to pay for new construction on the New Orleans levees.[46]

Although it is tempting to blame the Bush Administration for the failure to fund critical levee improvement projects, the truth is that improving the Lake Pontchartrain levees has been a low priority for many administrations, Democratic and Republican, and for Congress. The Administration and Congress have had other priorities over a longer period of time than the last four years. In fact, it seems clear that even the Louisiana congressional delegation has on occasion insisted that the Corps direct its resources to projects, like a $194 million project for deepening the Port of Iberia and replacing the lock on the Industrial canal, unrelated to the New Orleans levee protection system.[47]

Not a Corps Priority

The Corps of Engineers aided and abetted the lack of attention paid to protecting New Orleans in three ways. First, the Corps is very reluctant to participate in the process of setting priorities for its projects. Once the Corps has determined that the benefits of a proposed project exceed its costs, the Corps leaves it to Congress to decide through the appropriations process those projects that receive funding and those that do not.[48]

Second, the Corps' cost-benefit analysis procedures do not require the analysts doing the assessment to take potential loss of life into account in the analysis. According to the GAO, the Corps' guidance (Engineer Regulation 1105-2-100) directs analysts to address the issue of prevention of loss of life when evaluating alternative plans, but they are not required to formally estimate the number of lives saved or lost as a potential effect of a project.[49] In situations where historical data exist, the analysts have the option to estimate the number of persons potentially affected by a project and include this number as an additional factor for the consideration of decision makers. Hence, a high cost project that has few economic benefits, but which would save many lives, may not pass the cost-benefit test if the Corps does not include the lives saved as a monetized benefit.

Finally, even when Congress has appropriated money to protect New Orleans better, the Corps apparently has not been in a hurry to get the job done. For example, Congress in 1999 appropriated money for a $12 million study to determine how much it would cost to protect New Orleans from a Category 5 hurricane, but the study had not even been launched as of September 2005.[50]

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[46] Andy Sullivan, Budget Cuts Delayed New Orleans Flood Control Work, Reuters, Sept. 1 2005, available at http://www.alertnet.org/thenews/newsdesk/N01279059.htm

[47] Michael Grunwald, Money Flowed to Questionable Projects, *Washington Post*, September 8, 2005, at A1.

[48] Id. (quoting Tim Searchinger, senior attorney, Environmental Defense).

[49] Government Accountability Office, Improved Analysis of Costs and Benefits Needed for Sacramento Flood Protection Project 20 n.13 (2003) (GAO-04-3). Also, Jim Barnett, Instead of Shoring Up Levees, Corps Built More, *The Oregonian*, September 18, 2005, http://www.oregonlive.com/search/index.ssf?/base/exclude/112695455718420.xml?oregonian?lcg&coll=7.

[50] Andrew Martin & Andrew Zajac, Corps: Lack of Funds Did Not Contribute to Flooding, *Chicago Tribune*, September 2, 2005, at 1.

### *The Right Wing's Blame Game*

The reasons why New Orleans and its vulnerable citizens were not better protected are clear. The levee system was not designed to protect the city from more than a category 3 hurricane system, and there was little budget support for improving the levee system even though its limitations were widely recognized.

Some conservatives, however, are attempting to tell another story. Not long after the damage to New Orleans became apparent, retired Corps of Engineers officials and conservative pundits began a concerted campaign to blame the damage on the litigation that Save Our Wetlands and Lake Pontchartrain fishermen brought against the Corps of Engineers in 1976.[51] Citing the barrier project litigation and irrelevant litigation involving the Mississippi River levee system far upstream of New Orleans, conservative Commentator R. Emmett Tyrell, Jr. claims that "[f]or too long, environmentalist fanatics with no sense of a broad-based commonweal have had a veto over government and private-sector projects essential to the health and well-being of millions of Americans."[52] A conservative blogger referred to the lawsuit against the barrier project, described above, as "green genocide."[53] A house task force has decided to add the litigation to its agenda as it considers reforms for the National Environmental Policy Act (NEPA).[54] And the Bush Administration Justice Department has, at the request of Senator James Inhofe, circulated an email to its attorneys asking for information on any case in which they have defended the Corps from environmental claims involving the levees protecting New Orleans.[55] These claims are wholly unfounded.

Temporary Interruption

The lawsuit brought by the environmentalists was entirely justified. The EIS filed by the Corps was clearly inadequate. Nevertheless, it is clear beyond dispute that the injunction should have only delayed the project slightly until the Corps remedied the problems that the court had identified in the FEIS.

The court in the *Save Our Wetlands* litigation found that "the picture of the project painted in the FEIS was not in fact a tested conclusion but a hope by the persons planning the project that it could in fact be constructed so as to meet the environmental objectives set out in the FEIS."[56] The court noted that the Corps' chief engineer for the New Orleans Division had

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[51] Ralph Vartabedian & Peter Pae, A Barrier that Could Have Been, *Los Angeles Times*, September 9, 2005, at A1 (quoting former Corps of Engineers chief counsel Joseph Towers).
[52] R. Emmett Tyrell, Jr., Eco-Catastrophe Echoes, *Washington Times*, September 16, 2005.
[53] Michael Tremoglie, New Orleans: A Green Genocide, *FrontPageMagazine*.com, September 8, 2005, available at http://www.frontpagemag.com/Articles/rintable.asp?ID=19418.
[54] Ralph Vartabedian & Richard B. Schmitt, Mid-60s Project Fuels Environmental Fight, *Los Angeles Times*, September 17, 2005, at A17.
[55] Dan Egan, Senate Panel Investigating Challenges to Levees, *Washington Post*, September 17, 2005, at A10; Jerry Mitchell, E-Mail Suggests Government Seeking to Blame Groups, Mississippi *Clarion-Ledger*, September 16, 2005, at A1; Mark Sherman, Justice Dept. Looks at Lawsuits, Levees, *Seattle Post-Intelligencer*, September 16, 2005.
[56] Save Our Wetlands v. Rush, Civ. No. 75-3710, Slip Opinion (E.D. La. 1977).

requested further model studies because the studies upon which the draft EIS relied were undertaken more than a decade earlier for an obsolete version of the project. The chief engineer feared that the flow of water between the lakes, which was critical to maintaining the integrity of marine life in Lake Pontchartrain, was far less in the new version of the project than in the earlier version. The requested model studies were initiated, but they had not been completed when the FEIS came out, and it continued to rely upon the obsolete studies.[57]

More importantly, the biological analysis undertaken in the FEIS relied entirely on a single telephone conversation with a single marine biologist who was asked to speculate on the impact of the project on marine organisms using the inter-lake flow rates predicted by the obsolete model. The Corps of Engineers official who was responsible for preparing the EIS expressed reservations about the statements on the effects of the structures on marine life in the lake, and he suggested that the conclusion that the project "would not" have a significant impact on lake biology should be changed to "should not." He was, however, overruled. The court further noted that the assessment of the benefits of the project included the benefits of further urban development on wetlands that would be reclaimed from the lake after the project was completed, but it failed to take into consideration that the area had also been designated as a protected wetland. A Corps economist pointed this out and asked that the analysis be changed, but he was overruled.[58]

Finally, the court concluded that in light of "the problems of which the Corps was aware with respect to the possibility of significantly decreased tidal flow through the structures," the analysis of alternatives in the FEIS was inadequate. The court concluded that the FEIS "precludes both the public and the governmental parties from the opportunity to fairly and adequately analyze the benefits and detriments of the proposed plan and any alternatives to it."[59]

The court therefore enjoined further work on the barrier structures aspect of the project until the Corps had completed an adequate FEIS. It stated in no uncertain terms, however, that its opinion and order should "in no way be construed as precluding the Lake Pontchartrain project as proposed or reflecting on its advisability in any manner," and it stressed that "[u]pon proper compliance with the law with regard to the impact statement, this injunction will be dissolved and any hurricane plan thus properly presented will be allowed to proceed."[60]

Although some recent commentators have stated unequivocally that the court's injunction prevented the barrier project from going forward, there is simply no dispute that the injunction should have delayed the barrier option only until the Corps remedied the problems that the court had identified in the EIS. The court would have lifted the injunction as soon as the Corps of Engineers simply updated the EIS with adequate hydrologic modeling, as requested by its own chief engineer, conducted a more thorough biological assessment, and considered a few reasonable alternatives.

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[57] Id. at 5.
[58] Id. at 6.
[59] Id.
[60] Id. at 7.

The Real Story

The real story is considerably different from the version being promoted by conservative commentators and politicians. As established earlier, the Corps did not abandon the project because of the lawsuit. In the process of responding to the EIS, the Corps reevaluated the "high level" alternative and decided to adopt that approach instead. There was also intense public opposition to the barrier plan from local political officials and local citizens.

Moreover, it is now becoming clear that Hurricane Katrina destroyed as much as 90 percent of the levees and flood walls along the MRGO canal in St. Bernard parish as it pushed up the narrowing canal from Lake Bourne to the conjunction of the MRGO canal with the Industrial canal and that the same surge probably caused the breaches in the floodwalls along the Industrial canal. The barrier plan that Corps was considering at the time of the litigation would not have prevented the surge from moving from Lake Bourne through the funnel of the MRGO canal into the heart of New Orleans, and it might well have exacerbated that surge.

Finally, as discussed earlier, the 1977 barrier project would not have protected New Orleans from Hurricane Katrina, even if it had been built. The project was designed to withstand only a fast-moving Category 3 hurricane, based on a model called the "standard project hurricane,"[61] and it was never clear that the project would in fact have worked as envisioned, because the model was flawed. A spokesperson for the New Orleans division of the Corps acknowledged that he was not sure "how much [the barrier project] would have prevented anything."[62] It should not be equated with the recently proposed barrier projects designed to withstand a Category 5 hurricane and to be more environmentally friendly. It is by no means clear that the barrier project as envisioned in 1977 would have protected New Orleans from the Lake Pontchartrain surge of Hurricane Katrina.

## *Conclusion*

The failure of the levees in New Orleans was predicted. Scientists have warned for years that a strong storm could breach the levees. The reason is simple. The levees were not designed and built to protect the city and its most vulnerable citizens from more than a fast moving category 3 hurricane. Efforts to improve the levees have fallen victim to budget cuts in the Bush administration and previous administrations. The Corps also constructed a little used ship canal through the middle of New Orleans that made the city considerably more vulnerable to the flooding that occurred.

The right wing attempt to blame the environmentalists, while politically convenient, is completely rebutted by the facts. It is beyond dispute that the EIS litigation would have only temporarily delayed the Corps from pursuing the barrier option had it chosen to do so. We

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[61] Jerry Mitchell, E-Mail Suggests Government Seeking to Blame Groups, Mississippi *Clarion-Ledger*, September 16, 2005, at A1 (quoting Corps of Engineers spokesperson John Hall); John McQuaid & Mark Schleifstein, Evolving Danger, New Orleans *Times-Picayune*, June 23, 2002, at J12.

[62] Jerry Mitchell, E-Mail Suggests Government Seeking to Blame Groups, Mississippi *Clarion-Ledger*, September 16, 2005, at A1.

also know that the Corps decided to switch to the high level option because it believed that it was the better policy. This switch also responded to broad-scale local public opposition to the barrier option. In any case, the barrier option would not have prevented the flooding in New Orleans even if it had been completed. Neither the barrier nor high level option was designed to protect New Orleans from more than a category 3 hurricane. Moreover, the barrier option, had it been completed, would not have stopped the flooding that occurred along the ship canal.

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BY THE U.S. GENERAL ACCOUNTING OFFICE

## Report To The Secretary Of The Army

# Improved Planning Needed By The Corps Of Engineers To Resolve Environmental, Technical, And Financial Issues On The Lake Pontchartrain Hurricane Protection Project

The Corps of Engineers has not resolved environmental, technical, and financial issues associated with the Lake Pontchartrain Hurricane Protection Project. Although the Corps considers this project a high priority, its progress has not kept pace with earlier completed plans. Also, estimated project costs have grown from about $85 million to $924 million.

GAO recommends that the Secretary of the Army require the Chief of Engineers to take specific steps to resolve the issues associated with this major project.

119206

GAO/MASAD-82-39
AUGUST 17, 1982

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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

MISSION ANALYSIS AND
SYSTEMS ACQUISITION DIVISION

B-207860

The Honorable John O. Marsh, Jr.
The Secretary of the Army

Attention: The Inspector General
DAIG-AI

Dear Mr. Secretary:

We reviewed the status of the Corps of Engineers' (Corps) Lake Pontchartrain Hurricane Protection Project which is intended to provide hurricane protection to the Greater New Orleans metropolitan area. Although the Corps' District Office in New Orleans considers this $924 million project a high priority, its completion date has slipped from 1978 to 2008. In the 17 years since congressional authorization in 1965, only about one-half of the project has been completed.

We believe that improved planning is needed by the Corps to resolve certain environmental, technical, and financial issues. Environmental concerns have remained unresolved for almost 5 years after a court injunction prohibited the Corps from constructing certain parts of the project. The Corps is considering a change in its solution of providing protection from constructing barrier structures at the entrance to the lake and the raising of some levee heights (the barrier plan) to constructing much higher levees with no barriers (the high-level plan).

Various problems and conditions have caused delays in the project. Specifically:

--Engineering and environmental concerns have caused delays in project completion.

--Costly project work at the drainage canals has not been reported to the Congress, and technical and financial concerns which may impede project completion remain unresolved.

--Current project financing by the local sponsors has not been assured because of limited resources.

--Project cost estimates are understated, and a project plan has not been formally adopted.

B-207860

We recommend that you require the Chief of Engineers to develop (1) an acquisition strategy plan, and after approval, work closely with local sponsors to acquire the necessary rights-of-way, easements, and construction priorities for the remaining portions of the project, (2) an implementable technical approach to construction at the drainage canals that has concurrence from local sponsors, and (3) specific milestones for completing the remaining portions of the project. We further recommend that the Chief of Engineers estimate the cost to local sponsors if the high-level plan is adopted or the barrier plan is retained and obtain their concurrence on their financial shares.

Corps Headquarters officials believe that additional studies need to be completed before the Corps decides which plan to pursue--barrier or high level. Corps District officials believe that work on the project, except for the barrier complexes, has proceeded expeditiously. They attributed schedule delays primarily to unforeseen foundation problems, nonreceipt of rights-of-way, environmental concerns, and litigation. They agreed with the intent of our recommendations. They stated that they are already implementing our recommendations by (1) studying the details of the high-level plan and (2) planning to reinitiate technical and financial discussions with the local sponsors for work at the drainage canals. They believed, however, any change in the Hurricane Protection Plan could not be approved until the fiscal year 1985 budget is submitted to the Congress.

The local sponsors agreed with information in a draft of this report, but were concerned over their financial capability to meet their share of project costs. They believed the project construction could be pursued more expeditiously. One sponsor believed that Corps standards may be too high to obtain adequate, affordable, and speedy protection. Further details are contained in appendix I.

As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Operations not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the cognizant House and Senate legislative and appropriation committees; the Director, Office of Management and Budget; and the Chief of Engineers.

Sincerely yours,

W. H. Sheley, Jr.
Director

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# THE LAKE PONTCHARTRAIN, LOUISIANA, AND VICINITY HURRICANE PROTECTION PROJECT

## OBJECTIVES, SCOPE, AND METHODOLOGY

Our review of the Lake Pontchartrain Hurricane Protection Project was directed toward evaluating the current status; causes of cost, schedule, and performance problems; and their associated impacts on the project. We reviewed the legislative history to determine the authorized project scope. We reviewed Corps studies, plans, reports, and financial records to ascertain whether (1) features of the authorized work were still considered essential in view of current conditions, (2) planning for the project was clearly defined and effectively implemented, and (3) the estimated project milestones and costs were reasonable and were adequately reported to the Congress.

We discussed various aspects of these matters with officials of the Corps of Engineers, the State of Louisiana, and levee districts. We also obtained information from the Office of the Chief of Engineers, Washington, D.C.; Army Corps of Engineers' District Office in New Orleans, Louisiana, and its Lower Mississippi Valley Division Office, Vicksburg, Mississippi; the Louisiana State Office of Public Works, under the Department of Transportation and Development, Baton Rouge, Louisiana; the Orleans Levee District, New Orleans, Louisiana; the Jefferson Levee District, Harahan, Louisiana; the Pontchartrain Levee District, Lutcher, Louisiana; the Lake Borgne Basin Levee District, Violet, Louisiana; the St. Bernard Parish, Chalmette, Louisiana; the City of Mandeville, Louisiana; and various project sites.

Our review was performed in accordance with our "Standards for Audit of Governmental Organizations, Programs, Activities, and Functions."

## DESCRIPTION AND STATUS OF PROJECT

The Lake Pontchartrain Hurricane Protection Project was authorized by the Flood Control Act of 1965. Federal appropriations for the initial construction work were made available in May 1967. The Act did not specify a cost sharing ratio between federal and local jurisdictions. However, House Document 231, which preceded passage of the Act, specified that the local share would be 30 percent of the cost, which includes providing real estate and relocations.

After considering alternative plans, in 1965 the Corps prepared a plan for the project. This plan (the barrier plan) consisted of a series of levees and barriers at the tidal passes to Lake Pontchartrain which would, in the event of a hurricane, be

closed to control excessive overflow from the adjacent Lake Borgne. The Corps estimated a completion date of 1978. According to Corps officials, the project has been consistently ranked, within the Corps' New Orleans District, as one of their highest priorities.

After 15 years of trying to implement this plan, the Corps' New Orleans District is now considering a change in its approach to accomplish the project's goals by adopting a new plan known as the high-level plan. Initially, the high-level plan was a major competing alternative to the barrier plan; however, it was discarded by the Corps as being too costly. The high-level plan consisted of high levees and a floodwall system which would allow hurricane surges and waves into the lake. The surrounding areas would be protected by high levees ranging between 13.5 and 16.5 feet, as opposed to heights of 10 to 14 feet for the barrier plan. The Corps now estimates a completion date of 2008 for the project if the barrier plan is fully implemented.

In 1965 the cost of constructing the project in accordance with the high-level plan was estimated at 50-percent higher than the barrier plan. Also, the high-level plan would require more time to construct higher levees and would require more maintenance because of critical foundation problems.

Currently, the Corps' New Orleans District favors the high-level plan because it would cost less than the barrier plan. A cost estimate was prepared in 1981 which totaled $629 million for the high-level plan compared to $757 million for the barrier plan, excluding inflation. Also, Corps District officials now believe that the high-level plan would have fewer detrimental effects on Lake Pontchartrain's environment.

As of March 1982, about $171 million has been made available for the project--$131 million by the Corps and $40 million by the local sponsors. With the exception of certain project work which has been indefinitely deferred because of environmental concerns, all areas within the protective system have been enclosed by levees, providing varying degrees of hurricane protection. According to the Corps, all enclosed areas would escape flooding from all hurricanes, except for those whose intensity would occur about once every 60 years. When completed, the project is designed to provide for flood protection from all hurricanes, except for those whose intensity is expected to occur about once every 200-300 years.

ENVIRONMENTAL ISSUES

In December 1977 the Corps was enjoined by the United States District Court from constructing the barrier complexes, the New Orleans East levee system, and the Chalmette Area Plan of the

Lake Pontchartrain Hurricane Protection Project until an environmental impact statement was revised and accepted. The court modified its order in March 1978 and lifted the injunction against all features other than the barrier complexes. Currently, almost 5 years after the injunction, the Corps is still studying the impacts and has not completed a revised statement. Nevertheless, the Corps' New Orleans District tentatively selected the high-level plan for providing hurricane protection.

The court enjoined the Corps from constructing the project under the barrier plan because it found the Corps' environmental impact statement to be deficient. According to the court, the statement did not adequately

--explore and evaluate alternatives,

--use an interdisciplinary approach in its formulation,

--address benefits and costs of the project,

--assess environmental impacts, and

--provide a complete description of the project.

Barrier plan

Since the injunction, the Corps attempted to revise the impact statement using an interdisciplinary approach and conducted hydrologic, biologic, and chemical studies of Lake Pontchartrain. These studies show that the barrier plan would restrict the tidal flow in and out of Lake Pontchartrain by less than 10 percent at maximum tide. But, according to the Corps, the full impact of the plan on the ecological and aquatic composition of the lake could not be conclusively determined without additional studies. The Corps recently suspended several studies being done to analyze environmental effects that the barrier structures would have on Lake Pontchartrain because the high-level plan appeared more viable. According to the Corps, studies concerning the barrier plan would require considerable additional time and expense to complete, and a resulting impact statement could not be completed until November 1985.

High-level plan

In December 1981 the Corps directed future study efforts on the high-level plan because it does not have the detrimental impacts of the barrier plan and it protects developed areas by surrounding them with higher levees. The Corps is now developing environmental data for an impact statement in support of the high-level plan. This effort is expected to be completed in November 1983, when the statement is to be filed with the Environmental

Protection Agency. Corps officials believe that the impact statement for the high-level plan will satisfy the District Court.

TECHNICAL ISSUES

While some levee construction has continued, the project continues to experience delays because of technical issues.

Corps officials said that the major technical problems in the early years of the project were:

--Increased construction time for floodwalls, levees, and roads as a result of foundation problems discovered after project initiation.

--Delays in obtaining rights-of-way for construction. Rights-of-way are to be provided by local interests. However, these groups have not always agreed with the Corps' construction priorities and were occasionally reluctant to provide the specific rights-of-way requested by the Corps.

Also, there were delays associated with completion of design, plans, and specifications.

More recently, the project has been delayed because of the District Court injunction that prohibited the Corps from building the barriers. Also, the Corps has been unable, after almost 5 years, to prepare a suitable revised environmental impact statement to get the injunction lifted.

In its fiscal year 1982 budget submission to the Congress, the Corps reported a completion date of 1991 excluding the barrier complexes and levees for Jefferson and St. Charles Parishes. These latter two features were reported with indefinite completion dates. (See map in app. II).

A Corps District official said that either the barrier or the high-level plan can be completed between 1995 and 2000. District officials estimate that the project is 49-percent complete. However, we learned that the completion date of the total project is currently estimated to be 2008. No definitive schedule is available and no priorities have been established or agreed to with local sponsors regarding completion of the tentative high-level plan. However, work on the high-level plan's design memoranda, essential for the development of the detailed designs and preparation of schedules, was recently initiated.

Work required at drainage canals may further impede project completion

Work to eliminate potential hurricane surges from overflowing the levees along drainage canals is necessary under both the barrier and the high-level plans. Depending upon whether the Corps decides to accomplish this work by raising the height of levees only or by installing flood gates and pumping facilities, the cost of this work is estimated to be $20 million to as much as $250 million. Although either option will add significantly to project costs, it has not been reported to the Congress as a part of the annual budget submissions. Technical issues concerning work at the drainage canals must be resolved by both the Corps and local sponsors if this project is to be completed.

Subsequent to project authorization and based on the Weather Bureau's new data pertaining to hurricane severity, the Corps determined that the levees along the three main drainage canals, which drain major portions of New Orleans and empty into Lake Pontchartrain, were not high enough since they are subject to overflow by hurricane surges. The need for additional work at these canals became apparent during Hurricane Betsy in 1965, when conditions indicated that the levees had to be raised. Also, the pumps that are used for pumping water from basin areas over the levees could not effectively handle the hurricane-induced floodwaters. According to Corps officials, this feature is essential if the project is to be completely effective.

Proposed Corps solutions included raising the levees, building floodgates at the mouths of the canals, building auxilliary pumping stations, and relocating the existing pumping stations near the lake. Solutions are needed on how to overcome the surge problem, how to improve drainage pump efficiency, and how to finance these improvements. According to Corps' District officials, the design considerations can readily be solved once a plan of improvement is selected. However, Corps officials said there is a wide disparity between the local sponsors and the Corps on what can be provided under the project.

We were advised by Corps District officials that discussions were held in 1980 with local sponsors about drainage canal alternatives, but the discussions were not conclusive. These officials said that they plan to reinitiate technical discussions with the local agencies and develop a recommended solution for the canal problem, with estimated costs, by the end of 1982. Even though a solution has not been identified, Corps officials believe that any one of the alternatives being considered could be constructed in far less than 10 to 15 years.

Corps District officials confirmed that the drainage canal issues have not been disclosed to the Congress. They recognized

the need for a solution to this problem, but they have not determined the type, cost, or the amount of funding needed for the canal work. They currently believe, however, that no new congressional authorization would be required for this work since the project's objective of flood protection has not changed.

FINANCIAL ISSUES

Current project financing by the local sponsors is questionable because of escalating costs and limited resources. Also, reliable project cost estimates are needed for oversight, budgetary, and reporting purposes.

Financial capability of local sponsors is questionable

Although local sponsors have assured the Corps that they will finance 30 percent of the project costs, some of them may lack the financial capability to pay their share of future costs.

In 1976 five state and local sponsors provided assurances to the Corps that they would pay $110 million, or 30 percent of the total project costs. This payment would include cash, in-kind work, value of land, relocations, easements, and rights-of-way. The assurors agreed to a schedule of estimated minimum payments of $500,000 to $3 million per year, including interest, from 1977 through 1990 and a lump-sum payment of about $41 million in 1991. Thus far, according to Corps officials, the local sponsors have met their financial commitments.

According to Corps estimates, the local sponsors are currently responsible for $295 million of the project's cost. However, this estimate does not include the locals' share of costs for work at the drainage canals, which could range from $6 million to as much as $75 million. Consequently, sponsors are not aware of the full extent of their financial obligations. For example, Orleans Levee District officials said that no one knows the precise cost of work at the drainage canals, what will be done, who will pay for the work, or what their share of payment will be.

Local project sponsors said that they would have a difficult time meeting their financial obligations in view of limited resources and the escalating costs of the project. The local officials expect Louisiana's Office of Public Works, a coordinating agency, to assist in obtaining the needed funds from the Louisiana State Legislature.

According to a Corps' District official, the Corps analyzes local sponsors' financial capability to meet their share of a project's cost by reviewing the sponsor's financial statements and taxing authority. This type of analysis was made for the barrier plan several years ago, but has not been updated. Accordingly,

Corps officials are unaware of the local sponsors' current financial capability.

If the high-level plan is adopted, assessments of the local sponsors' financial capability will be needed and new assurances from them may also be required. Corps officials said that these analyses will not be made, however, until the revised environmental impact statement is completed.

Project cost is understated

The estimated cost of the project under the barrier plan has increased from $84.8 million in 1965 to $924 million in 1982. The federal share is $629 million. This includes an estimate for inflation through 2008, the estimated completion date. Cost growth has occurred because the cost of the barrier structures, which represent about one-half of that plan's cost, increased as a result of enlarging their sizes to satisfy environmental concerns. Also, inflation has caused a considerable amount of the cost growth since the project's inception. However, these costs do not include estimates for work at the drainage canals.

Also, the cost estimates for the tentative high-level plan are preliminary and have not been definitized to show the total project costs, including inflation. Consequently, the Congress, the Office of Management and Budget, the state of Louisiana, the local sponsors, and the Corps do not have complete information to discharge their respective oversight and management responsibilities.

Omission of construction at drainage canals

The Corps prepared cost estimates under the barrier plan, but excluded costs of work that will be required at the drainage canals. Although the Corps considers this work an essential feature of the project, it was excluded from program cost estimates in 1976 because of uncertainties over (1) the Corps' authority to do this work as part of the project and (2) the best technical means to solve the potential overflow problem and provide needed interior drainage. Work at the drainage canals is now estimated to cost from $20 million to as much as $250 million, excluding inflation. This critical feature was excluded from the estimates provided to the Congress. The Corps states that a more accurate estimate cannot be made until it decides whether it will use levees only or a combination of levees, gates, and pumping stations to accomplish this work.

## VIEWS OF RESPONSIBLE OFFICIALS

### Office of the Chief of Engineers

Officials of the Corps' Office of the Chief of Engineers believed additional engineering, environmental, and cost studies need to be completed before the Corps decides which plan to pursue--barrier or high level. They said this effort includes clarifying the work to be done at the drainage canals, as well as understanding the local sponsors' ability to share in these costs. They stated that because of the environmental litigation, the Corps has had a general reluctance to proceed with the project, since it had a lack of in-house capability to determine how to perform the required environmental studies to satisfy the court. These factors contributed to project delays despite the high priority designation by the Corps. Corps officials believed sufficient funds would be available to complete the project by 1991. However, until the Corps' studies are completed, reviewed, and approved by late calendar year 1983, they stated they would not report any tentative change in the project plan to the Congress.

### New Orleans District

Corps District officials believed that work on the project, except for the barrier complexes, has proceeded expeditiously. They recognize, however, that there is a residual threat to the area after several years of work. They pointed out that no significant flooding occurred during Hurricane Camille in 1969 and estimated that $100 million in damages was prevented. Design and construction progress, they said, has been influenced by public policy which resulted in legal action against the barrier portion of the project. District officials further stated that the levee and floodwall portions are now 70 percent complete.

The officials said that schedule delays are not correctable by more intensive management. They attributed the delays primarily to unforeseen foundation problems, nonreceipt of rights-of-way, environmental matters, and litigation. With respect to work at the drainage canals, they stated that a number of technically feasible solutions are implementable, but there is a wide disparity between local desires and what can realistically be provided for under the project.

District officials agreed with the intent of our recommendations and said that the following actions are being taken or planned: (1) studies are being made on whether to pursue the high-level hurricane protection plan, considering the engineering, economic, and environmental aspects, and a recommendation is expected to be provided to higher authority by December 1982, if necessary, (2) the Corps plans to reinitiate technical discussions with local sponsors and develop a recommended solution for the

drainage canal problem, with estimated costs, by the end of 1982, and (3) when a plan is adopted by the Corps and cost estimates are developed, meetings with local sponsors are planned to get their concurrences on their respective cost shares. Because of the review and approval processes within the Corps, they believe any change in the plan could not be disclosed to the Congress until the fiscal year 1985 budget submission. In the meantime, they said that they are pursuing completion of those features common to both the high-level and barrier plans, primarily the construction of levees.

State and local sponsors

State and local sponsors generally agreed with our findings, conclusions, and recommendations. They believed the Corps has not pursued this project with the expediency necessary to protect the New Orleans area and that only another disaster resulting from a hurricane and heightened public interest would probably expedite project completion. The sponsors' major concerns were escalating project costs and their limited financial capability to pay for their share under either plan.

Orleans Levee District officials believed that the Corps' standards may be too high for what is really needed for adequate protection and for what is affordable by local sponsors. For example, they said that Corps standards required widening the levee base by 200 feet to raise the levee height by 1.5 feet. They recommended that the Corps lower its design standards to provide more realistic hurricane protection to withstand a hurricane whose intensity might occur once every 100 years rather than building a project to withstand a once in 200- to 300-year occurrence. This, they believe would make the project more affordable, provide adequate protection, and speed project completion.

CONCLUSIONS

Seventeen years after project approval, residents of the New Orleans area are still without the hurricane protection anticipated when the project was initiated. Although a large portion of levee construction has been done, the project is still in the planning stage, since another project plan is under consideration and a revised environmental impact statement has yet to be completed and approved. The project is not likely to be completed until all project features have definite completion schedules, the drainage canal problems are resolved and considered in the overall schedule, and additional funding is provided.

While we recognize that the Corps has been enjoined from construction until a revised environmental impact statement is accepted, there has been no strong effort to complete this project until recently, when preparation of design memoranda was initiated. Construction at the drainage canals represents an

essential project feature which should have been considered earlier. This feature should be recognized and finalized with local sponsors to ensure effective hurricane protection. If technical and financial issues associated with the drainage canals are not resolved, project completion will be further impeded.

Questions remain as to whether local sponsors will be able to adequately finance their share of the project. Financing has not been assured because project costs have increased, the local sponsors may have limited financial capabilities, and State assistance is not certain. Work at the drainage canals will result in an additional financial burden on the local sponsors. Furthermore, sponsors will be expected to bear higher financial burdens if the high-level hurricane protection plan is adopted or if the barrier plan is retained.

RECOMMENDATIONS

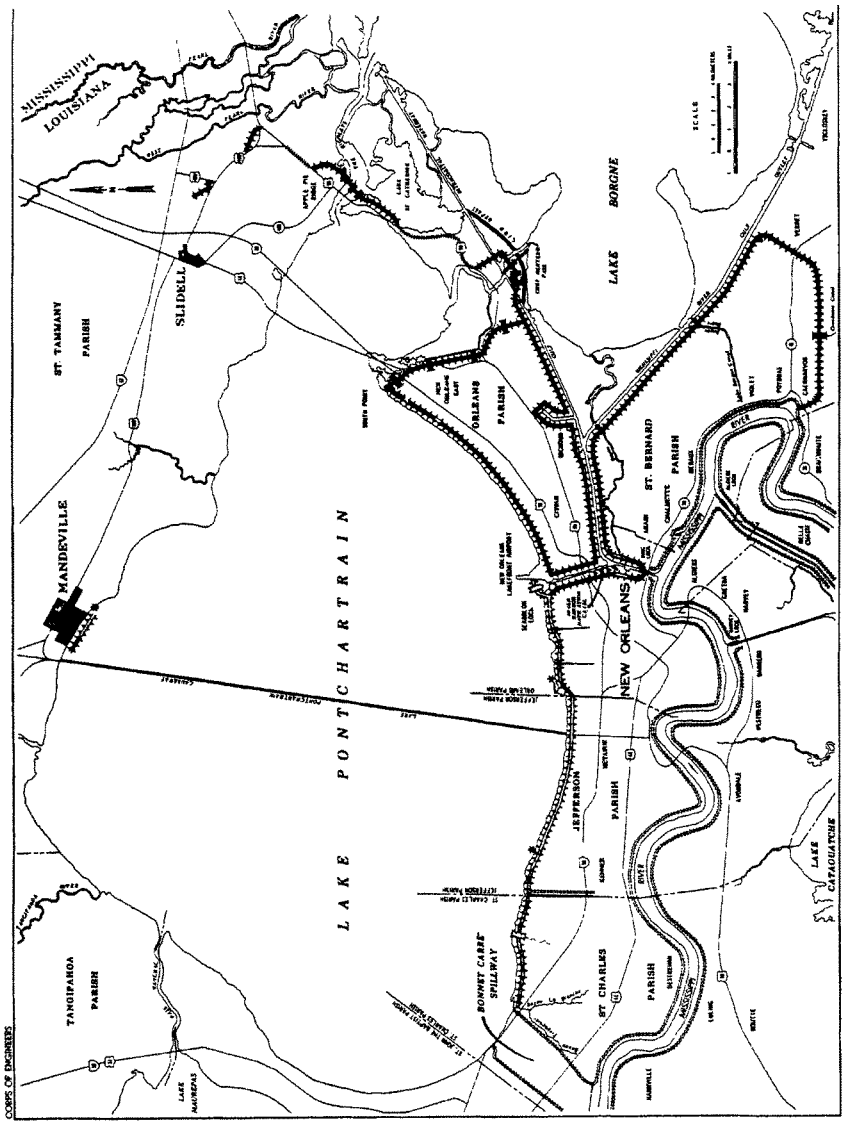
To resolve environmental and technical issues, we recommend that the Secretary of the Army require the Chief of Engineers to develop (1) an acquisition strategy plan, and after approval, work closely with local sponsors to acquire the necessary rights-of-way, easements, and construction priorities for the remaining portions of the project, (2) an implementable technical approach to construction at the drainage canals that has concurrence from local sponsors, and (3) specific milestones for completion of the remaining portions of the project.

To ensure adequate financing by local sponsors of their share of project funding, we recommend that the Secretary of the Army require the Chief of Engineers to

--estimate the cost to local sponsors if the high-level plan is adopted or if the barrier plan is retained and

--obtain local sponsors' concurrences on financial shares to be borne by them.

LAKE PONTCHARTRAIN, LOUISIANA, AND
VICINITY HURRICANE PROTECTION PROJECT



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