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MOVING FORWARD AFTER HURRICANES KATRINA AND RITA

FIELD HEARING

BEFORE THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

ONE HUNDRED TENTH CONGRESS

FIRST SESSION

FEBRUARY 26, 2007—NEW ORLEANS, LA

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ONE HUNDRED TENTH CONGRESS
FIRST SESSION

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C O N T E N T S

Page

FEBRUARY 26, 2007

OPENING STATEMENTS

Boxer, Hon. Barbara, U.S. Senator from the State of California 1
Vitter, Hon. David, U.S. Senator from the State of Louisiana 4
Cardin Hon. Benjamin L., U.S. Senator from the State of Maryland 5
Isakson, Hon. Johnny, U.S. Senator from the State of Georgia 7
Klobuchar, Hon. Amy, U.S. Senator from the State of Minnesota 8
Whitehouse, Hon. Sheldon, U.S. Senator from the State of Rhode Island 10
Landrieu, Hon. Mary, U.S. Senator from the State of Louisiana 10

WITNESSES

Woodley, Paul John, Assistant Secretary of the Army (Civil Works) and Major General Don T. Riley, Director of Civil Works, U.S. Army Corps of Engineers 12
Prepared statement 13
Responses to additional questions from:
Senator Cardin 17
Senator Whitehouse 18
Greene, Richard, Regional Administrator, Region VI, U.S. Environmental Protection Agency 19
Prepared statement 20
McDaniel, Mike, Secretary, Louisiana Department of Environmental Quality . 34
Prepared statement 36
Nguyen, Vien The, Reverend, Pastor of the Mary Queen of Vietnam Church ... 72
Prepared statement 73
Subra, Wilma, Subra Company 92
Prepared statement 93
Coffee, Sidney, Chair, Louisiana Coastal Protection & Restoration Authority 142
Prepared statement 144
Twilley, Robert, Director and Wetland Biogeochemistry Professor, Department of Oceanography and Coastal Science, Louisiana State University 146
Prepared statement 147
Roach, Randy, Mayor, Lake Charles, LA 155
Prepared statement 156
Jackson, Thomas L., President, Southeast Louisiana Flood Protection Authority-East 158
Prepared statement 159

ADDITIONAL MATERIAL

Statements:
Coastal Protection and Restoration Authority of Louisiana 166
Louisiana Department of Environmental Quality 168

MOVING FORWARD AFTER HURRICANES KATRINA AND RITA

MONDAY, FEBRUARY 26, 2007

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
New Orleans, LA

The committee met, pursuant to notice, at 10 o'clock a.m. at the Louisiana Supreme Court Building, 400 Royal Street, the Hon. Barbara Boxer (chairman of the committee) presiding.

Present: Senators Boxer, Vitter, Isakson, Cardin, Klobuchar, Whitehouse, and Landrieu.

OPENING STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR FROM THE STATE OF CALIFORNIA

Senator BOXER. This hearing of the Senate Environment and Public Works Committee will come to order. First I want to say how pleased we are to be here and I want to tell you how we are going to proceed before I make my opening statement. And that is that we have three panels who we are going to hear from. And before they get to testify each of us is going to make an opening statement, which will range between 3 and 5 minutes. I would urge all of our witnesses not to go over 5 minutes, because if you do, I have to do this (indicating), just because we want to have time for questions. So that's how we are going to proceed now.

Before our panels we are going to hear from the Hon. Mary Landrieu. And then I'm going to ask her to please join us right here next to me so that we have Louisiana's two Senators up front and center as they should be at this very important hearing.

So good morning everyone, and thank you for joining us at the very first field hearing of the Senate Environment and Public Works Committee this Congress. And it shows how important the subject matter is that we are here.

As the new chair of this committee I felt it was important for our very first field hearing to be here in New Orleans. The critical issues we will address today: Hurricane protection, wetlands restoration, and management of the massive amounts of debris left in the aftermath of Hurricane Katrina and Rita are a top priority for this committee and with the continued help and terrific leadership of your two Senators we intend to stand by the people of New Orleans. You deserve it. This great American city, this beautiful State and region continue to need our attention and will not be forgotten as long as I sit in this chair.

I want to thank the members of the U.S. Senate who are here today in support of this effort. It wasn't easy to get here. We had

all kinds of weather issues and they stuck with it and I just want to say thank you to them.

And again, I want to recognize my colleagues from Louisiana for ensuring that we continue to focus on the needs of this hard-hit region. Senator Landrieu asked if I would conduct this hearing as quickly as possible at the start of the new Congress since our committee is responsible for oversight of the Army Corps of Engineers' wetlands and waste disposal. These issues continue to have central importance as we move forward in the aftermath of the hurricanes.

Senator Vitter is a member of the Environment and Public Works Committee and he has stressed the importance of dealing with ongoing challenges in his State, including the problems with debris in landfills. He also asked that we hold the hearing on this issue and I appreciate his strong interest in ensuring that this committee play an active role in addressing these matters. And we must, because it is our job.

And again, as chairman of this committee, I want to assure all involved that we will stay focused on what needs to be done. Tragedy suffered by this region will be forever fixed in our minds. Since arriving last evening, members of this committee have traveled to some of the devastated areas, including reviewing the damage from the air this morning. Although there are many signs of hope, much of the devastation from Katrina is still all too clear. A year and a half after the storms a lot of work remains.

Now, we know that there have been serious failures by our Government and we must learn from the past. But personally, I want to focus on the future. We want to be constructive and we want to do what is necessary. One thing I can assure you is that Congressional oversight of our Government is back. When the Army Corps of Engineers, the EPA or other Federal agencies are doing something right, we will commend them. But when they are not, we want to know so the problem can be fixed cooperatively and in a bipartisan way.

The levees and flood walls should have protected the people of New Orleans but they failed, unleashing tragedy and unleashing horror. We now have several studies looking at what went wrong, the region lacked a comprehensive and effective system to protect it from the kind of storm surges that came with Katrina and Rita. As chairman of this committee I'm determined that we consider necessary legislation to address hurricane protection and restoration as part of the Water Resources Development Act and that we do it soon. And I want to say that your two Senators are pressing and we are all pressing to get this bill done and I commit to you we will get it done and we will have it on the floor of the Senate at the end of March. I would say we will have it out of the committee at the end of March and be pressing for it to be on the floor of the Senate from that time forward.

It has been over 6 years since we had a WRDA bill and critical projects such as the Morganza Hurricane Protection Project and Louisiana Coastal Area Program need attention now. We must commit ourselves to restoring Louisiana's natural hurricane protection system, the wetlands. We know that when storms pass over warm, open Gulf waters, they strengthen. We know we are going to be facing that even more in the future with global warming. For

centuries the protective wetlands of the Louisiana coast blunted the force of countless storms, absorbing their energy and softening their impact, but those wetlands have been disappearing before our eyes. Today Louisiana's Coastal wetlands are only half as wide as they were 50 years ago. If we fail to restore disappearing wetlands there will be no floodwall high enough, no levee big enough and no pumps strong enough to protect this city and the coast.

We also need to address the disposal of tons of debris generated by the hurricanes and flooding. We will examine concerns about possible risks of release of chemicals from these landfills, potential risks of flooding of the landfills, about illegal dumping in certain areas of the city.

Now, we know how much you have suffered here, and the first message I want to give you again is a message of hope, that you will not be forgotten, that we are working together in a bipartisan way to bring justice to this area. And now I would turn it to Senator Vitter. Thank you, Senator.

[The prepared statement of Senator Boxer follows:]

STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR FROM THE STATE OF CALIFORNIA

Good Morning, and thank you for joining us at the first field hearing of the Senate Environment and Public Works Committee in this Congress. As the new Chair of this Committee, I felt that it was important for our very first field hearing to be here in New Orleans. The critical issues we will address today—hurricane protection, wetlands restoration and management of the massive amounts of debris left in the aftermath of Hurricane Katrina and Rita, are a top priority for this Committee.

This great American city, this beautiful State and region, continue to need our attention and will not be forgotten.

I want to thank the six members of the U.S. Senate who are here today in support of this effort. I particularly want to recognize my colleagues from Louisiana for ensuring that we continue to focus on the needs of this hard hit region.

Senator Landrieu asked if I would conduct this hearing as quickly as possible at the start of the new Congress since our Committee is responsible for oversight of the Army Corps of Engineers, wetlands and waste disposal—these issues continue to have central importance as we move forward in the aftermath of the hurricanes.

Senator Vitter is a member of the Environment and Public Works Committee, and he has stressed the importance of dealing with ongoing challenges in his State, including the problems with debris and landfills. He asked that we hold a hearing on these issues, and I appreciate his strong interest in ensuring that the Committee play an active role in addressing these matters.

As Chairman of this Committee, I want to assure all involved that we will stay focused on what needs to be done.

The tragedy suffered by this region will be forever fixed in our minds. Since arriving last evening, members of this Committee have traveled to some of the devastated areas, including reviewing the damage from the air this morning. Although there are many signs of hope, much of the devastation from Katrina is still all too clear. A year and a half after the storms, a lot of work remains.

There have been serious failures by our Government, and we must learn from the past. But I want to focus on the future. We want to be constructive, and to see what we can do now.

One thing I can assure you is that Congressional oversight of our Government is back. When the Army Corps of Engineers, the Environmental Protection Agency, or other Federal agencies are doing something right, we will commend them. But when they are not doing their jobs, we want to know so the problem can be fixed cooperatively, and in a bipartisan way.

The levees and floodwalls should have protected the people of New Orleans. But they failed, unleashing a tragedy and a horror that was to some unimaginable, but in fact was foreseeable.

We now have several studies looking at what went wrong in protecting this region. The region lacked a comprehensive and effective system to protect it from the kind of storm surges that came with Katrina and Rita.

As Chairman of the Environment and Public Works Committee, I am determined that we consider necessary legislation to address hurricane protection and restoration as part of the Water Resources Development Act and that we do it this year.

It has been over 6 years since we had a Water Resources Development Act, and critical projects such as the Morganza hurricane protection project and the Louisiana Coastal Area program need action now.

We must commit ourselves to restoring Louisiana's natural hurricane protection system the wetlands. We know that when storms pass over warm, open Gulf waters, they strengthen. For centuries, the protective wetlands of the Louisiana coast blunted the force of countless storms, absorbing their energy and softening their impact.

But those wetlands have been disappearing before our eyes. Today, Louisiana's coastal wetlands are only half as wide as they were 50 years ago.

If we fail to restore Louisiana's disappearing wetlands, there will be no floodwall high enough, no levee big enough, and no pumps strong enough to protect this city and coast.

We also need to address the disposal of tons of debris generated by the hurricanes and flooding. We will examine concerns about possible risks of release of chemicals from these landfills, potential risks of flooding of the landfills, and about illegal dumping in certain areas of the city.

I am committed to working with Senators Landrieu and Vitter and the members of this Committee to accomplish what is needed for Louisiana and the region. Today's hearing is an important step in that process.

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

Senator VITTER. Thank you very much, Madame Chair. And I want to start by thanking you and the rest of the committee for being here and for holding this very important field hearing. Many committees in the Congress do field hearings regularly. What is so unusual about this is the very significant and broad representation we have. We will have seven U.S. Senators here, seven percent of the entire U.S. Senate, and I want to thank each and every one of you, as I know Mary does, for making the trip and being here and seeing things firsthand.

This committee is enormously important to our recovery on the Gulf Coast. When I first came to the Senate, in 2004, I came to this committee and was honored to do so then. I'm even more honored to be on the committee now and find it even more of an important opportunity because of everything we are working through with Hurricanes Katrina and Rita.

This committee oversees every activity of the U.S. Army Corps of Engineers, so needless to say, there are so many very important issues related to our recovery that are fore square before this committee. And in addition, of course, this committee oversees environmental issues. So other important issues, landfill issues, dumping issues are right before our jurisdiction as well.

Thank you, Madame Chair, again for this hearing. I started work on a hearing like this in late 2006 and it really came out of some meetings I had in New Orleans East with Father Nguyen and many other citizens out there who were particularly concerned about the landfill issues that we are going to discuss during the hearing. And we began making plans for a hearing. And then, Madame Chair, you immediately picked up on those plans and expanded them and went forward as soon as you became chairman. So I appreciate that and I appreciate your bringing this hearing to the New Orleans area, as you said, the first field hearing of this

committee in the new Congress. I think that is very meaningful and very significant.

Again, we are going to talk a lot today about crucial Corps of Engineers' issues and all the Corps activity is in the jurisdiction of this committee, coastal restoration first and foremost; closing MRGO, which has to happen; reforming and improving the processes of the Corps in infusing that process with more outside independent scientific expertise; and also changing Congressional procedure as it relates to the Corps. The vitally important program, Morganza, the Gulf to provide some beginning hurricane protection to populated areas to the west of here, which right now have virtually none. All of these are enormously important programs, priorities that the Corps' involved in, and therefore, this committee is involved in it.

With regard to all of that, my bottom line and my plea, which I know the Chairman has heard and agrees with, is very simple. All of this moves forward and we have enormous positive language and proposals in the WRDA bill which we're currently working on. WRDA is W-R-D-A, stands for Water Resources Development Act, and it is a major water resources bill that moves through this committee. It's long overdue to be passed. It should have been passed at least two or three years ago, but we really need to get it done now because all of these issues are in WRDA and all of these issues can move forward positively through WRDA.

So, Madame Chair, thank you for your commitment on WRDA and I certainly want to work with you and the rest of the committee to accelerate the process any way we can. We were talking on the bus about how we might accelerate that process.

Finally, again, the genesis of this hearing from my point of view was a focus on the very significant landfill issues in New Orleans East and the very legitimate concerns of that community. I look forward to discussing that in Panels 1 and 2. I do think they are very serious issues. I have grave concerns about what has gone on and what is going on at the old Gentilly landfill and I don't think you need to look any further than the front page of today's Times-Picayune to understand some of the history that brought us here today. Certainly we'll be discussing that in the hearing.

Thank you, Madame Chair.

Senator BOXER. Thank you, Senator. Senators, the clock is right over there in front and so I'm going to turn it now to Senator Cardin of Maryland who was one of those Senators who waited around until very late last night to get here. We so appreciate it, Senator.

OPENING STATEMENT OF HON. BENJAMIN L. CARDIN, U.S. SENATOR FROM THE STATE OF MARYLAND

Senator CARDIN. Well, Senator Boxer, let me thank you very much for having this hearing. Let me assure you the time was not wasted. Secretary Woodley used that time to give me a private tutorial on canals and pumps and levees, so I appreciate that very much and I really want to thank you for conducting this hearing.

I wanted to come here to New Orleans. It was not an assignment that was looked at as a burden. I wanted to be here. I wanted to see firsthand what was happening in New Orleans. Senator Lan-

drieu and Senator Vitter both told me that you need to be here to see; that you can't just read about it or look at the pictures, but you need to come by and see what is happening in New Orleans.

I want to you know as a Senator who represents the people of Maryland, we are going to do everything we can to help. We want to restore a quality of life to people of this area that reflects the commitment of our nation. We also want to learn from what happened here. We want to get it right. We also want to learn. I represent a State in which water is a major part of our life. We live with water in Maryland and we know the beauty of it. We also know the danger of it. I want to make sure that we learn with what happened in Katrina so that we can take steps to protect people so that we can minimize these natural disasters.

Katrina was the worst natural disaster in my lifetime affecting the people of our country. It was made worst because Governments were not prepared to do what they needed to do at all levels and we have to get it better. We have to understand what has happened.

We also understand that the issue deals not just with building the levees and the pumps and the canals, but also dealing with the buffers, the wetlands. We have to do a better job in restoring wetlands in this area.

I understand that during the course of this hearing we are going to lose wetlands that equal several football fields in that short period of time, because of the way in which we have developed life, the way we have changed the flow of the river, the way that we have built buildings. Well, we need now to take affirmative steps to improve the wetlands, to improve the buffers, so that the great work of our engineers in building stronger levees and better designed canals and pumps will be also supplemented by protecting the areas from the natural buffers that are so important in a storm, or so important just to deal with normal flooding conditions that are a way of life for people who live on coastal areas.

So I also wanted to see some of the housing. I was disappointed I didn't get here earlier because I had an appointment to meet with some people in the Lower Ninth Ward. We did by today in the tour to see some of the neighborhoods. And I understand the complexities—certainly better now than before I got here, the complexities of restoring communities and neighborhoods.

But we have to pay attention in Washington. Neighborhoods need our help. People's lives have been literally uprooted. We need to find a way to expedite return of some degree of normal life to neighborhoods today that still do not have that commitment from all of us.

So, Madame Chair, I thank you for convening this hearing and for bringing together the type of witnesses I think that we can learn a lot from. This is a very important hearing. I'm glad it's our first field hearing so that we can benefit from the expertise that's in this room.

Senator BOXER. Senator, thank you very much. It's my pleasure to call on Senator Isakson of Georgia, who's very interested in this hearing and has been a very active member of this committee.

Senator, welcome.

[The prepared statement of Senator Cardin follows:]

STATEMENT OF HON. BENJAMIN L. CARDIN, U.S. SENATOR FROM THE STATE OF MARYLAND

Madam Chair, thank you for holding this field hearing today, here in New Orleans. Because we have so many witnesses, so many topics, and so little time, I'm going to be brief. I really consider this a "hearing" in the true sense of the term an opportunity for the Environment & Public Works Committee to hear from some of the people who have been directly affected by the worst natural disaster in our Nation's history and who will help the region recover and rebuild.

I would like to make two brief points. First of all, Katrina was the worst natural disaster we have experienced but it's important to acknowledge that it didn't have to be. There were failures at all levels of Government which others have documented before, during, and after the storm hit. These failures from poor design, construction, and maintenance of the levees and floodwalls to inadequate evacuation plans and resources made a bad situation much worse.

I bring this up because much of the rhetoric we have heard the past few decades has been about tearing Government down. And we allowed that to happen: not enough resources, not enough oversight.

To put it simply and starkly, Katrina grimly illustrated the consequences of bad Government and the need for good Government. The flooding didn't have to be so extensive, and people didn't have to be stranded for days on the roofs of their homes or at the Superdome.

I think it's time to re-acknowledge that there are certain goods and services only Government can provide. Instead of spending all our time and effort trying to get rid of Government, let's a find a way to make sure it provides those goods and services as effectively and efficiently as possible.

The second point I would make is that we tend to think there's a "technological" solution to all of our problems. That's why I appreciate the fact that part of this hearing is devoted to the issue of wetland losses and restoration.

Wetlands provide an excellent natural "buffer" system to absorb and reduce the impact of storms. But during the course of this hearing, wetlands the size of four to five football fields will sink into the Gulf of Mexico. Much of that loss is attributable to human activities.

Protecting New Orleans and the other cities and towns along the Gulf Coast from the next big storm isn't just an engineering issue. It's not just about bigger, stronger levees and floodwalls. We have to stop wetland losses and give this natural buffer system of barrier islands, wetlands, grass marshes, and cypress swamps a chance to recover.

Thank you again, Madam Chair, for holding this field hearing. I look forward to hearing from our witnesses. We all have an enormous task at hand: to help one of America's greatest cities come back, to help the entire Gulf Coast come back, and to protect this wonderful area and its people from having to endure something as devastating and horrific as Hurricane Katrina and its aftermath ever again.

OPENING STATEMENT OF HON. JOHHNY ISAKSON, U.S. SENATOR FROM THE STATE OF GEORGIA

Senator ISAKSON. Well, thank you. And thanks first of all, to your commitment to bring the hearing here. Senator Landrieu and Senator Vitter made sure that every one of us in the Senate every day understand the plight and the concerns of Louisiana and I pay tribute to both of them on the efforts they have made on behalf of this great city and your State.

Like Senator Cardin, I'm delighted to be here. I have equity in the city of New Orleans. I paid tuition at Tulane for 4 years. My oldest son graduated 15 years ago. I have fond memories. My wife and I honeymooned at 727 Toulouse Street in the Maison De Ville 39 years ago and in my former profession I worked closely with Latter and Blum and Gertrude Gardner in the real estate business and have talked with those principals since the Katrina catastrophe and the following Rita catastrophe and understand the great plight and difficulties that the real estate industry and the homeowners in this region and this particular city have had.

So as ranking member of the Transportation and Infrastructure Subcommittee, I'm especially glad to be here today and I pledge at the outset my hardest effort and best effort to accelerate the Federal, State and local partnership in the reconstruction of this great city and this region. I'm delighted to be in the city today and I'm anxious to hear from the Corps both on the immediate reaction to the hurricane response operation and their ongoing reconstruction efforts in the New Orleans area. I'm equally interested in Senator Vitter's statements with regard to Gentilly landfill.

But most importantly of all, I'm proud to be here as a part of a committee that wants to do everything it can to help this great city, this State and this region recover from a great catastrophe. I yield back to the Chair.

Senator BOXER. Thank you, Senator, for you eloquent words. It's my pleasure to call on Senator Klobuchar of Minnesota and we're just thrilled she's on the committee.

[The prepared statement of Senator Isakson follows:]

STATEMENT OF HON. JOHNNY ISAKSON, U.S. SENATOR FROM THE STATE OF GEORGIA

Thank you Madam Chairman, and Senator Vitter. I appreciate the opportunity to participate in today's hearing, the latest in a series of oversight hearings conducted by this Committee since the devastation caused by hurricanes Katrina and Rita. New Orleans is a very special city to many Americans, and also to me personally. My wife Dianne and I honeymooned here 38 years ago, and my son John is a graduate of Tulane University. New Orleans holds a special place in my family's hearts. I'll be brief in my opening remarks so that we can get to our witnesses, except to say the following.

Given this Committee's jurisdiction over the Civil Works mission of the Army Corps of Engineers, and given my position as the Ranking Member on the Transportation and Infrastructure Subcommittee, I am especially interested in hearing from the Corps regarding their hurricane response operations and their ongoing reconstruction and restoration efforts in the New Orleans area. I pledge to do all I can to work with my colleagues on this Committee and in the Senate to provide the proper oversight of the Corps, and resources to the Corps, to ensure that they fulfill their obligations to the people of New Orleans, LS, and the Gulf Coast.

I am also interested in hearing from our witnesses regarding disaster debris management and removal. This issue is, in my mind, equally critical to facilitate the recovery here in New Orleans. As we saw today at the Gentilly Landfill, the types and amounts of debris generated by the storms is just staggering. We need to be sure that the manner in which we handle these wastes does not pose a threat to human health or the health of the environment here in New Orleans and Louisiana.

Thank you again Senator Boxer and Senator Vitter, and I yield back the balance of my time.

OPENING STATEMENT OF HON. AMY KLOBUCHAR, U.S. SENATOR FROM THE STATE OF MINNESOTA

Senator KLOBUCHAR. Thank you. Thank you, Madame Chair. And I want to extend a special thanks to you for holding this hearing here as well as Senator Landrieu and Senator Vitter for hosting us here. I can tell you from being on the Senate floor, both of them are constantly have these issue up front and center. I don't think there is a Senator that they haven't talked to about this and you should know that about them.

I wasn't in the Senate when this area was struck by Hurricane Katrina and Rita, but I can tell you what I felt as a citizen of the State of Minnesota and that's what the rest of this country felt, which was sadness and despair over the tragedy and the horror

and then a disappointment in our failings as a Government, failed policies that contributed to the disaster, and a failed response that exacerbated it. Then there was the pride and the pluck in the spirit of the people of New Orleans in how you responded to this. And actually there is a friend out there, Brad Cousins, who was my aide in the DA's office for many years and he had gone to college at Tulane and then he was going to law school and he could have gone to any law school across the country. And after Katrina hit he wanted to go to Tulane and he came back here as a member of the first class that got together after Katrina. And that's the kind of pride and pluck that I'm talking about and he was a Minnesota.

Finally, I think we all felt a deep obligation to help, to do our part to make sure that we restore this vital region. As the other Senators have noted, we spent last night and today looking at the devastation, seeing some of the good that has been done, but also seeing the work that needs to be done and I can tell you Minnesota has a connection to New Orleans. As you know, the mighty Mississippi starts in Minnesota. You can actually walk across it. Lake Itasca is something all kids in Minnesota—it's obligatory, you go up and say you walked across the Mississippi River. But more than that, we have a connection in that our commerce comes down this river and the entire country has really counted on the Mississippi and its Gulf Outlet as a vital channel of commerce.

I see us as stakeholders in a strong and thriving Port of New Orleans and coastal region. Just for one example, the farmers in our State ship hundreds of millions of bushels of crops on barges to Louisiana Gulf ports and ultimately to the world beyond. Without thriving coastal wetlands and a vibrant chain of barrier islands, Louisiana's systems of port, which handles more tonnage than any other port in the country, would be left unprotected and in the path of future storms.

Secondly, as stakeholders we have a collective responsibility to make sure that the money spent to restore the ecosystem and to rebuild and protect the communities is wisely spent. This means to me a number of things. It means a coherent, integrated plan for this entire region, not a piecemeal collection of assorted projects so that we can get our best return on our investment.

My background is as a prosecutor. I remember when we tried to do things regionally and statewide with our criminal justice system. We wanted to get one set complaint that we would use and I still remember a local police chief from a small jurisdiction saying: I can't do that. I just bought new file cabinets. They wouldn't fit. We have to go beyond that as we work together as a State and as a country to look at this integrated plan. It also means putting science before politics so that we are spending our money on projects that are ecologically and economically sound.

And finally, it means exercising real oversight in asking the tough questions so that we in Congress make sure that the taxpayers' hard-earned money is being spent well.

I look forward to hearing today about the progress so far and the challenges ahead and I look forward to a bipartisan effort to find creative and lasting solutions. Thank you.

Senator BOXER. Senator, thank you so much. And now we will hear from the Senator from Rhode Island, another Senator who waited for hours and hours in the snow yesterday in Washington. We are just so delighted he's here. Senator Whitehouse of Rhode Island.

OPENING STATEMENT OF HON. SHELDON WHITEHOUSE, U.S. SENATOR FROM THE STATE OF RHODE ISLAND

Senator WHITEHOUSE. Thank you, Madame Chairman. I had the chance to share in the Cardin tutorial, so it was not wasted time. As a lawyer who has practiced for many years, as a private lawyer and as a prosecutor, I want to let you know how pleased I am that the Supreme Court has let us use their room. It's a great thrill to sit here as a Justice would and I want to express our appreciation to Chief Justice Calogero and Justice Kimball, who are here, for their courtesy in having us use this great place.

As a Senator from Rhode Island I share a very active concern about the effect of natural disasters, particularly hurricanes on our State. Many of you know that we are repeatedly struck with hurricanes. The most famous was the legendary hurricane in 1938, which was enormously destructive. And with the buildup that has happened since then if an event like that were to occur, it is not difficult for me to transplant the images that I saw this morning, looking out the window of those Blackhawk helicopters, to my home State, so I think I can speak for all of us when I say you have our full attention. And it's been inspiring to see the signs of determination and resiliency as Louisiana and New Orleans have sprung back. Certainly that energetic spirit was on energetic display last night in the French Quarter as we passed through. But there clearly is also a lot of work to be done. And as I see the places that have not yet recovered and transplant those images to my home State, to Rhode Island, it becomes very, very clear to me why in our Democratic caucus, when we have the chance to sit together as Democrats and talk with each other, why Senator Landrieu is so relentless and so passionate and so persistent on this subject.

I mean, from the news coverage you know it's real, but when you come down here, you see it even more clearly. So I look forward to these hearings and I thank you, Madame Chair.

Senator BOXER. Thank you, so much. And now it's a great honor to call on the Senior Senator from Louisiana, Senator Landrieu, whose been a driving force along with Senator Vitter in focusing our attention on what has happened here. Senator, welcome. And we hope when you finish, you will take your little name plate and come on and join me right here.

OPENING STATEMENT OF HON. MARY LANDRIEU, U.S. SENATOR FROM THE STATE OF LOUISIANA

Senator LANDRIEU. Thank you, Madame Chair. Let me begin by reiterating how grateful we are that you chose Louisiana for your first field hearing. For the New Orleans region, for all of south Louisiana, and for our future, that choice is one that we will always be grateful for. The fact that six of your members showed up for this committee is also very significant and that three members

who have only been in the Senate less than two and a half months chose this as one of their first trips when you were asked to go hundreds of places. Senator Vitter and I cannot tell you how grateful we are that you said yes and that you waited for 6 hours snowbound and still made the trip is even more commendable.

I want to thank the Court for allowing us to continue to use this space, which is quite dignified, for the subjects that we discuss here, which is life and death and the future of this region and the contributions that this region has made over many, many decades and centuries to the growth and development of the greatest nation on earth. So we appreciate the dignity of this room and the fact that Justices Calogero and Kimball continue to give us their space. I hope it's not impeding on their workload, but they seem to be handling it very well and we appreciate that. Very briefly, Madame Chair, I hope that we can cover three very important pieces today and develop a stronger Congressional record on three major points: One, to more fully grasp the cost and scope of the disaster that occurred here and the challenges that still remain in coordinating the levee system and coastal restoration system and internal pumping system that has to work together, coordinated and integrated for this region and for south Louisiana to remain safe and secure. It is very difficult for people outside, even for us that have lived here our whole life, to understand the interworkings of the levee system, the wetland system and pumping system to keep this area dry and to keep it safe. But as we flew on the helicopter this morning and we looked out and shared some thoughts, I said: It's hard to find a beach anywhere around here because we aren't on a beach. We are not on the Gulf. We were founded and protected by miles and miles of wetland with a great levee system that we have simply failed to sustain and keep up, and as a result, billions of dollars of damage have occurred.

In your opening statement, Senator, I don't have to convince you of this because your opening statement reflected your significant grasp of this situation. That's why I'm so thrilled in your leadership for this committee and coming from Sacramento, a major capital city of a major State, you understand the challenges that also may occur to your own City of Sacramento.

Secondly, the importance of the passage of the WRDA bill it is crucial. Louisiana has 20 percent of all the projects in that bill. I would like to say because our delegation is strong and we are determined, but it's also because we have most of the water in the country. Since it's a water bill. We have a lot of water projects. It's been stuck for 7 years. We have to unstuck it—unstick it, move it forward and get the WRDA bill passed from the Morganza to the Gulf, which is a new authorization, that's been struggling for 20 years for its full authorization and a Golden Meadow levee system and others that need to move forward. We are very appreciative.

Thirdly, the Congressional record should reflect after this hearing the tremendous strides that the State of Louisiana has made. Sometimes it's overlooked that this State has already passed a Constitutional amendment to dedicate the new monies that we will receive from the great 37 1/2 percent share of offshore oil and gas revenues that will be dedicated, as Senator Klobuchar said, not to piecemeal, but to a long range project. The consolidation of our

levee boards has occurred. The framing of the LCA, Louisiana Coastal Authority, has been framed. New appointments have been made and our team is ready to go, to work with you to build a system that will never fail the people of this city and region or the people of this country again.

And, finally these landfill issues are extremely important, but to put this in perspective, we generate about 350,000 tons of waste a year. Katrina left us with 22 million tons to deal with. 350,000 on a regular year. 22 million tons of debris. Larger than anything the country has ever experienced. So obviously there are challenges. We want to work with the neighborhoods, work with the communities, and with this committee's leadership, I'm sure we'll find the solution.

Thank you, Madame Chair. And I will join you at the dais.

Senator BOXER. Thank you, Senator, so much and we would ask now that the Panel 1 come up here, which is John Paul Woodley, Assistant Secretary of the Army, Major General Don T. Riley, Director of Civil Works, U.S. Army Corps of Engineers, and Richard Greene, Regional Administrator, Region 6, U.S. Environmental Protection Agency.

Gentlemen, thank you so much and thank you for arranging this very important helicopter tour that we took this morning. Every minute that we've been together, whether it was on the ground last night, looking at the latest addition to safety, which is that incredible series of pumps and the gate. It's the 17th Street bridge, is that where we were? Canal, yes. You have been just very, very helpful.

So, General, are you all going to make opening statements? How are we going to work this?

Mr. WOODLEY. No, Senator. I will make one statement on behalf of the Army.

Senator BOXER. Thank you. Go ahead, sir.

STATEMENT OF JOHN PAUL WOODLEY, ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

Mr. WOODLEY. I'm John Paul Woodley and I'm the Assistant Secretary of the Army for Civil Works and I'm accompanied here by Major General Don Riley, Director of Civil Works of the Army Corps of Engineers. We have submitted a joint detailed written statement to the committee and so I will be very brief. I want to say, Senator, that the Corps of Engineers is very important for the City of New Orleans and has been for many generations. The reason for that is very simple. The reason is that New Orleans is very important to the Nation. I'm very proud of the work that the Corps of Engineers has undertaken to date both in response to the catastrophe and in rebuilding the protected works. But I'm also mindful of the many challenges that lie ahead.

This hearing is very important and I want to express our profound gratitude to you and to all the Senators who have attended to draw attention to this issue and to move forward in working together. There is no place for rancor. There is no place for demagoguery. There is only room here for understanding and analyzing our issues, the difficulties that we face, and arriving together at

strategies to meet them. So thank you very much for the opportunity to present testimony today.

Senator BOXER. Okay. I will start off with questions, and then I will turn to Senator Vitter, and we are going to try to keep the questions—I thought you were going to speak for everybody?

Mr. WOODLEY. Well, only for the Army. The EPA——

Senator BOXER. Mr. Greene.

Mr. GREENE. Mr. Woodley is represented by a very distinguished representative.

Senator BOXER. That's okay. I was confused. This is our EPA, how could I forget?

[The prepared statement of Mr. Woodley follows:]

STATEMENT OF JOHN PAUL WOODLEY, ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

INTRODUCTION

Madam Chair and other members of the committee, I am John Paul Woodley, Jr., Assistant Secretary of the Army (Civil Works). Attending this hearing with me is Major General Don Riley, Director, Civil Works, for the U.S. Army Corps of Engineers. Thank you for the opportunity to be here today to discuss the hurricane response operations and the ongoing reconstruction and restoration efforts by the U.S. Army Corps of Engineers in the New Orleans area. As you know, the New Orleans Hurricane Protection System was extensively damaged during Hurricane Katrina. The Corps has completed repairs on 225 miles of the system. However, due to the significant changes in the coastal environment, and geological, and other changes that have occurred over many decades, the system does not provide the level of risk reduction envisioned when it was first authorized. We are working actively to address this concern and are also pursuing ways to improve upon the existing Hurricane Protection System.

My testimony will focus on the Hurricane Protection System Restoration, Ecosystem Restoration, and the debris removal mission.

HURRICANE PROTECTION SYSTEM RESTORATION STATUS

The Hurricane Protection System for the greater New Orleans metropolitan area consists of a series of levees, floodwalls, gates, armoring and pump stations.

Design and construction activities are focusing on building the system to the level of risk reduction envisioned when it was first authorized, while implementing further improvements where appropriate. The designs themselves are being accomplished through a combination of contracts with private industry and the Corps of Engineers. All designs are then vetted through the independent technical review process. Furthermore, we will continue to assess and improve designs throughout the construction process.

Generally, the Corps is working to reduce the risk of flood damage in the greater New Orleans metropolitan area from a storm with a one percent chance of occurring in any one year, which is known colloquially as a 100-year storm. To determine the impact of such a storm, we assembled a group of national and international experts to advance modeling techniques to determine both surge and wave heights by storm frequency for the area within the existing Hurricane Protection System. This is a progressive advancement encouraged by the American Society of Civil Engineers (ASCE) and the National Research Council. We are using this information in designing levees and floodwalls to reduce the risk of flood damage from such a storm.

The FY 2008 Budget, released earlier this month, recommends, as part of an FY 2007 Supplemental appropriations package, enactment of a statutory provision to authorize the Secretary of the Army to reallocate up to $1.3 billion of the emergency supplemental appropriations that were provided in FY 2006, but that remain unobligated. The proposed reallocation will enable the Corps to apply this funding to those measures that will best improve the near-term, overall level of risk reduction in the greater New Orleans metropolitan area. It will enable the Corps to complete higher priority work sooner, in concert with similar work in other areas.

The estimate of the cost of the work necessary to accomplish our work is expected to increase as a result of various engineering forensic investigations and assessments, a review of new storm surge data from the Interagency Performance Evaluation Task Force Risk and Consequence study currently underway, increased mate-

rial costs, and other factors. Updated, actionable re-estimates will not be available until this summer.

While the Corps is moving forward with design and with refining cost-estimates for future work, we continue to make progress on ongoing work. The Corps has recently awarded contracts to furnish 11 additional pumps at the 17th Street Canal and eight additional pumps at London Avenue and to construct the pump platforms and install the pumps. The addition of these pumps will increase capacity at 17th Street to approximately 7,600 cubic feet per second (cfs) and increase capacity at London Avenue to approximately 5,000 cfs. These reflect increased capabilities based upon the Interagency Performance Evaluation Task force (IPET) modeling for the city's 10-year design storm. This increased pumping capacity will be in place by August, 2007. While the work at the outfall canals is not yet complete, by June 1, 2007, we will have increased pumping capacity at 17th Street from 4,060 cfs to 5,200 cfs. Pumping capacities at Orleans Avenue and London Avenue Canals will remain at 2,200 cfs and 2,800 cfs, respectively, on June 1, 2007.

Additionally, the Corps has completed upgrading the manually operated gates to mechanical operation. The mechanically operated gates provide storm surge protection at the outfall canals when a major storm is approaching. The temporary pumps in the outfall canals will provide interior drainage capability comparable to conditions that existed during major storms prior to Hurricane Katrina. We continue to prepare for the expected spring rains and the next hurricane season.

RESTORATION EFFORTS

We are engaged on several fronts with respect to ecosystem restoration in coastal Louisiana. These activities are now conducted under various authorities. A key challenge that we face is finding a way to integrate all of these activities. If our strategy for restoring the ecosystem is to be successful, we will also need to ensure that our efforts to improve the level of risk reduction from future hurricanes in Louisiana are compatible with the long-term needs of the ecosystem.

MISSISSIPPI RIVER GULF OUTLET

Since Hurricane Katrina, the Corps of Engineers has been involved in a number of simultaneous efforts located on or near the Mississippi River Gulf Outlet (MRGO). These efforts include emergency levee repairs, ecosystem restoration projects, and development of a proposed plan for de-authorizing deep draft navigation. Using some of the funds that the Congress appropriated in Public Law 109-234 (the fourth emergency supplemental appropriations act of 2006), we have been working on options to restore and protect critical coastal wetlands along MRGO, as well as ways to design structures for saltwater intrusion and storm surge prevention. Work is now underway to protect critical wetlands buffering some of the levee systems in the MRGO area. This work will help maintain important natural wave buffers and ecological habitats in the Lake Borgne estuary located east of New Orleans and in St. Bernard Parish. Residents of the area depend on these wetlands for storm damage reduction, recreation and commercial fishing activities. Our work also includes preparing a proposed plan for de-authorizing deep draft navigation on the MRGO. In December we submitted an Interim Report to Congress, which explored the future of navigation and addressed storm damage reduction and wetlands restoration in the channel area.

ECOSYSTEM RESTORATION

The fourth emergency supplemental appropriations act of 2006 provided $20.2 million to reduce the risk of storm damage to the greater New Orleans metropolitan area by restoring the surrounding wetlands through measures to begin to reverse wetland losses in areas affected by navigation, oil and gas, and other channels and through modification of the Caernarvon Freshwater Diversion structure or its operations.

The landbridge in Barataria Basin is subsiding and eroding at an alarming rate. This land loss threatens not only fish and wildlife habitat but also oil and gas infrastructure and numerous communities, including Barataria, Lafitte, and the west bank of Orleans and Jefferson Parishes. Without the landbridge, the basin would be subjected to greater intrusion from the Gulf of Mexico, including hurricane storm surge. To restore the fragile marsh, Federal and State agencies partnering under the Coastal Wetlands Planning Protection and Restoration Act of 1990 (CWPPRA) developed a series of complementary projects, each rebuilding or protecting a different piece of the landbridge. When completed, these projects will rebuild and protect more than 5,000 acres of wetlands. We are also looking at other options for ecosystem restoration in the vicinity of the landbridge.

The Corps is evaluating options for improving the performance of the Caernarvon Freshwater Diversion Project. The alternatives under consideration include modifications of its operation and/or combinations of channel restoration, increased sediment delivery, and marsh creation.

COASTAL WETLANDS PLANNING, PROTECTION AND RESTORATION ACT

The CWPPRA program was authorized in 1990. The CWPPRA program is available only for restoration work in the State of Louisiana. The Federal Government finances 85 percent of the program's costs through the Sport Fisheries and Boating Trust Fund, and the State covers the other 15 percent of the costs.

CWPPRA provides targeted funds for planning and implementing cost-effective projects that create, protect, restore and enhance wetlands in coastal Louisiana. There are 143 projects in the program which will create, protect, or restore over 120,000 acres of wetlands in coastal Louisiana. Project impacts range in size from nine acres to 36,121 acres. The types of projects include freshwater and sediment diversion, outfall management, dredged material/marsh creation, shoreline protection, sediment and nutrient trapping, hydrologic restoration, marsh management, barrier island restoration, and vegetation planting. Currently, 70 projects have been completed, another 18 are under construction, and 55 are in some stage of planning or design. Under this Act, the principal Federal wetlands agencies and the State use a competitive process for allocating funds to potential wetlands restoration projects. They try to select the best individual projects on the merits, but lack an overall strategy to identify integrated groups of projects that could yield greater environmental benefits by acting in concert on a watershed basis.

LOUISIANA COASTAL AREA ECOSYSTEM RESTORATION

Given the magnitude of Louisiana's coastal land loss and the extent of the associated ecosystem degradation, it is apparent that a more systematic approach would be the best way to restore natural processes. Larger-scale projects to benefit the ecosystem are needed. The barrier islands and coastal marshes of Louisiana also provide a natural buffer against some storm surges, and are a critical element of any overall strategy for reducing the risk of storm damage to the urban centers of the coast.

The Corps, in collaboration with the State of Louisiana, Federal and State agencies, and other stakeholders, has developed a Louisiana Coastal Area (LCA) Plan. This plan builds upon progress made under CWPPRA and is intended to guide the next phase of the restoration effort. The LCA plan is a near-term, 10-year plan of studies, projects, and program elements, with a total cost of $1.9 billion. We are currently undertaking investigations and plans to implement some of the proposed restoration features, and are working to address some of the key scientific uncertainties and engineering challenges associated with coastal restoration.

However, we believe that the Congress should not authorize the LCA plan through a conventional authorization. To reduce taxpayer costs and make better use of the available funds for restoring coastal Louisiana wetlands, the Administration has urged the Congress instead to enact a broad authorization covering all studies, construction, and science work that would support the wetlands restoration effort, including the measures now undertaken under CWPPRA, without regard to the specific projects and funding allocations envisioned in the LCA plan.

The kind of authorization that we have recommended will ensure that the coastal Louisiana restoration effort will be able to adapt and evolve as needed based on the best available science. Also, the Corps selected and formulated the projects proposed in its 10-year plan principally to address ecological benefits. While the program should retain its current ecological focus, it needs to establish priorities based on a full array of the potential benefits. This will require identifying opportunities where changes to the size, design objectives, or location of wetlands projects would advance ecosystem as well as storm damage reduction objectives.

COASTAL PROTECTION AND RESTORATION

The Corps began its Louisiana Coastal Protection and Restoration (LACPR) study in 2005. We are considering a full range of flood and storm damage reduction and coastal restoration measures, including those that could reduce the risk of damage from a "Category 5" storm. Potential measures are being developed based on extensive stakeholder involvement efforts with the State, resource agencies, Nongovernmental Organizations, academia, and the public. These measures will be integrated into alternatives, with the objective of developing an overall plan to improve the existing coastal restoration and protection system. We are using a risk-based approach to evaluate alternatives for risk reduction to people, property and coastal landscape

stabilization and performance for design levels ranging from the stage-frequencies that could be expected during a 100-year storm to those that might occur during a much more severe storm. Our analysis will focus more extensively on uncertainty and will include consideration of relative sea level rise, redevelopment rates, and storm intensity and frequency. A preliminary draft report was submitted to Congress in July 2006.

As you can see, we have a wide range of programs and studies underway to reduce the risk of flood and storm damage, protect and rebuild the coastal wetlands, or both. As we go forward, particularly with the LACPR study, we will need to keep in mind the importance of integrating these dual, complementary objectives in a way that will promote a long-term, sustainable vision for the coast.

DEBRIS REMOVAL

Hurricanes Katrina and Rita created catastrophic devastation throughout the Gulf region. In the State of Louisiana, some 60 million cubic yards of debris were strewn throughout 21 parishes covering almost 15,000 square miles. In order to maintain compliance at Federal, State, and local levels for debris management, the Corps coordinated extensively with Federal, State and local agencies, for debris removal planning and execution.

WASTE SEGREGATION AND DISPOSAL

From the outset of the response, the corps applied rigorous protocols for segregation, collection, processing, staging, recycling, and disposal of hurricane generated waste to sustain compliance with environmental laws and regulations. Specific waste streams, which require special handling, included municipal solid waste, vegetative debris, construction and demolition debris, small motorized equipment, asbestos containing materials, electronic waste, household hazardous waste, white goods and tires.

Robust quality control and quality assurance programs were followed throughout operations to assure the appropriate disposition of waste. The Corps employed quality assurance personnel to monitor segregation, collection and disposal of hurricane debris. Contracts for debris removal required execution of quality control plans to assure the application of waste disposal protocols. The Federal Emergency Management Agency (FEMA) and the State of Louisiana employed monitors to augment the Corps' quality assurance practices. The Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA) provided field oversight to address public health and worker protection needs respectively. Additionally, we brought our own team of auditors to assist in monitoring the work.

Special care was exercised to ensure the proper handling and disposal of Resource Conservation and Recovery Act (RCRA) Subtitle C hazardous waste and household hazardous waste that is often commingled with debris. The EPA established and managed the operation of a hazardous waste processing center in eastern New Orleans for handling and disposal of hazardous waste until November 2006, when the operation of the site was turned over to the Corps. Approximately 5 million units of household hazardous waste have been processed through the site since the commencement of operations.

LANDFILLS

To date, 48 landfills have been used for disposal of hurricane Katrina generated waste and 21 have been used for hurricane Rita generated waste. Presently, there are nine active landfills. The permitting of landfills for receipt of hurricane generated debris falls under the jurisdiction of the Louisiana Department of Environmental Quality. The Corps does not engage in a direct contractual relationship with permitted landfills, but reimburses our prime contractors for tipping fees charged for waste disposal. Contractors have the discretion to direct hurricane waste to any of the properly permitted landfills to optimize the efficiency of their debris removal operations. The New Orleans area was served by four landfill facilities; Chef Menteur, Gentilly, Riverbirch, and the Highway 90 construction and demolition (C&D) landfills. Chef Menteur was an Enhanced Type III landfill that was permitted to accept C&D and non-regulated, asbestos containing material (ACM). The Chef Menteur landfill was opened from April 13 to August 15, 2006. Riverbirch is a Type I & II landfill that is National Emissions Standards for Hazardous Air Pollutions (NESHAP) compliant and can accept regulated ACM (RACM), as well as other types of residential debris. Highway 90 is a Type III landfill that can accept C&D and non-regulated ACM. Gentilly is a Type III landfill that can accept residential C&D and non-regulated ACM. The Gentilly landfill is best situated to accept the

hurricane debris from the city of New Orleans, excluding RACM, due to its proximity to the waste stream.

GENTILLY LANDFILL

The Old Gentilly Landfill (Gentilly Landfill) is located in an industrial corridor in eastern New Orleans. The facility is owned by the City of New Orleans and operated by Amid Metro Partnership, LLC. Commencing in the 1960's, the Gentilly Landfill operated as a municipal landfill for solid waste generated in and around the City of New Orleans. The facility stopped accepting waste around 1986. The City applied for a permit in June of 2002, to reopen as a Type III Landfill to be constructed over the closed, municipal landfill. The Louisiana Department of Environmental Quality (LDEQ) issued a Standard Solid Waste Type III Permit on December 28, 2004. In response to Hurricane Katrina, LDEQ issued a Declaration of Emergency and Administrative Order dated August 30, 2005, and subsequent amendments, which authorized the disposal of uncontaminated construction and demolition debris at permitted Type III landfills. On September 29, 2005, LDEQ issued a Commencement Order to the City authorizing the disposal of hurricane debris at the Gentilly Landfill.

Corps contractors started using the facility on October 2, 2005, initially receiving an average daily quantity of 20,000 to 25,000 cubic yards (CY) of C&D material during the first month. The operation quickly ramped up to a daily average of 40,000 to 50,000 CY over the next two months. On October 31, 2005, the Louisiana Environmental Action Network (LEAN) filed a Petition for Judicial Review of the Commencement Order citing concerns related to environmental sustainability and structural stability of the landfill which is in close proximity of the MRGO hurricane protection levee. LDEQ and LEAN entered into a Consent Judgment on March 16, 2006, which resulted in establishment of a daily limit of 19,000 CY pending issuance by LDEQ of a decisional document addressing concerns raised by LEAN. FEMA subsequently directed the Corps to limit daily quantities to 10,000 CY at the end of February and further curtailed the daily quantities to 5,000 CY in March 2006. LDEQ issued their decisional document on August 28, 2006, which substantially addressed issues raised by LEAN. FEMA responded by relaxing the daily quantity limits. At present, the limit has been set at 15,000 CY per day.

This concludes my testimony. Madam Chair, again, thank you for allowing me to testify on the ongoing efforts of the Corps of Engineers in the New Orleans area. I will be happy to answer any questions you or the other Members may have.

RESPONSES BY JOHN PAUL WOODLEY TO ADDITIONAL QUESTIONS FROM SENATOR CARDIN

Question 1. Certainly we will need a stronger inner line of defenses around population centers, but I am concerned that the Corps is focused too narrowly on physical structures and not enough on nature's speed bumps: - wetlands and coastal barrier islands. What assurances can you give the Committee, and more importantly to the people of Louisiana, that you have the right balance in your plans for a sustainable future for the Gulf Coast?

Response. The Interagency Performance Evaluation Task Force (IPET) risk assessment for New Orleans included a new and technically robust process to estimate the future hurricane threat to New Orleans and the Gulf Coast. Scientists from the Corps, FEMA, NOAA, academia and industry, developed this process. It was determined early on that using historical data would not accurately project the future hurricane environment that the Gulf faces.

The new method, the Joint Probability Method—Optimal Sampling, uses a range of potential hurricanes that range from relatively common events to very rare events to represent the future hazard. The storms are of a variety of intensities and sizes and follow a variety of tracks. They incorporate the latest knowledge of climate dynamics, including cycles of more intense and more frequent storms. The process also incorporates the latest information on hurricane behavior and the relationships between hurricane characteristics and surge generation potential. The hurricanes drive the most advanced surge and wave models to generate knowledge of the surge and wave conditions that might occur for any location around the region. The hazard is, as such, not the storms, but the probability of experiencing levels of surge and waves by location. This is much more sophisticated and relevant information for assessing the potential performance of hurricane protection measures and to understand how to increase protection and reduce risk.

Sea level rises can be incorporated into this approach with regard to the total water levels that the protection structures face. Just as the normal tidal cycles are

factored into the water surface elevations, so can long-term sea level rises. The sea level rise projections are based on the best knowledge to date and can be adjusted as methods and information improve. Sea level rise and subsidence have both been factored into the 100-year structure designs to help ensure that they will be effective for the future, not just at the time of construction.

Question 2. I am from Maryland and am familiar with the difficulties of large-scale ecosystem protection in a heavily populated region. Restoring the Chesapeake Bay has been a difficult undertaking, as I know that Secretary Woodley understands from his time in Virginia. But two of the strengths of the Chesapeake Bay restoration effort have been its reliance on good science and its willingness to integrate multiple objectives in a coherent fashion. Secretary Woodley, is the Corps relying on the entire scientific community in developing its plans, and, if so, can you describe that collaboration?

Response. Yes, the Corps is relying on the collaboration of an extremely large and diverse group of scientists. For example, the report prepared by the Interagency Performance Evaluation Task Force (IPET) is the result of an intense performance evaluation of the New Orleans and Southeast Louisiana Hurricane Protection System during Hurricane Katrina. The IPET is a distinguished group of Government, academic, and private sector scientists and engineers who dedicated themselves to this task from shortly after Katrina struck through the publication of this report. The IPET was created by the Chief of Engineers, U.S. Army Corps of Engineers, and the group's work was peer reviewed on a weekly basis by a distinguished external review panel of the American Society of Civil Engineers and independently reviewed by the National Research Council Committee on New Orleans Regional Hurricane Protection Projects. The IPET applied some of the most sophisticated capabilities available in civil engineering to understand what happened during

Katrina and why. Their purpose was not just new knowledge, but application of that knowledge to the repair and reconstitution of protection in New Orleans as well as improvement to engineering practice and policies. The results of much of the IPET work are largely already in the ground, having been transferred and applied prior to the formal completion of this report.

RESPONSES BY JOHN PAUL WOODLEY TO ADDITIONAL QUESTIONS FROM SENATOR WHITEHOUSE

Question 1. You testified that you are in the process of rebuilding at least parts of New Orleans's levee system to a hundred-year storm level. To what degree have you included the possible rise in sea level attributable to global warming in your projections of a hundred-year storm event? How has global warming been factored into the hundred-year-event calculation?

Response. Sea level rises can be incorporated into the Joint Probability Method that the Corps is using to model potential future hazards, with regard to the total water levels that the protection structures face. Just as the normal tidal cycles are factored into the water surface elevations, so can long-term sea level rises. The sea level rise projections are based on the best knowledge to date and can be adjusted as methods and information improve. All Federal levees in the New Orleans area are being designed for 100-year protection and incorporate factors related to subsidence and sea rises. Project designs often include changes such as performing several lifts in order to maintain the authorized degree of protection. In fact, construction of the lifts occurs at intervals throughout the project life.

Question 2. Ordinarily, for major public works projects, a "critical path" document is prepared that lays out priorities and the scope of work. You indicated to me during the hearing that this material exists, but that all stakeholders in the rebuilding effort have not yet signed onto the plan. Please provide a copy (or, if publicly available, please identify the location) of the critical path document and specify your efforts in soliciting support from affected parties.

Response. The Hurricane Storm Damage Reduction System (HSDRS) is comprised of over 250 projects (or system components) ranging from storm-proofing pump houses to levee armoring to floodgate construction. Because of the number of components, diversity in engineering solutions, and vast scope of work required to complete the system protection, there is not one critical path document. However, each project does have a critical path method (CPM) schedule. We are currently reviewing these schedules to ensure they can be executed to produce the 100-year protection system authorized by the U.S. Congress. This involves reviewing interactions among schedules and ensuring sufficient construction resources are available at the scheduled time.

STATEMENT OF RICHARD GREENE, REGIONAL ADMINISTRATOR, REGION VI, U.S. ENVIRONMENTAL PROTECTION AGENCY

Mr. GREENE. Good morning, Madame Chair and members of the committee. I'm Richard Greene, Regional Administrator for the Environmental Protective Agency. I appreciate the opportunity to share a brief summary of my more thorough opening comments that we have filed with you that deals with EPA's response to Hurricanes Katrina and Rita.

While our mission under the National Response Plan is to deal with environmental impacts and remove threats to human health and safety in the storm-damaged communities, I cannot begin to tell you how much our hearts have gone out to the people who have suffered and continue to suffer as a result of these disasters. We are profoundly moved by the loss of life and the realization that thousands of countless lives of people have changed forever. At the same time we are reminded on a daily basis of the incomparable human spirit on display here and throughout the Gulf area.

When the people of EPA first arrived in New Orleans our priority became that of helping to rescue approximately 800 men, women and children from rooftops, out of attics and trees and wherever else they were stranded. After that, we got on with our mission and at the peak of our activities the number of EPA employees and contractors assisting with our response efforts exceeded 1,400 in Louisiana alone.

In reviewing what we have done it is difficult for even some of us to relate to the magnitude of our work. The resuscitation of the numbers and of things we have done and the network of local, State and Federal partners is detailed in my written statement so I won't repeat them here. Needless to say, they exceed anything this agency has ever done before. Our successes include the following: The collection and recycling of major appliances and electronic goods, the collection and disposal of 5 million containers of hazardous waste, the restoration of drinking water and wastewater systems, the collection and analysis of thousands of floodwater sediments and soil samples, the cleanup of schools and other public facilities, the cleanup of major oil spills, assistance to the State in developing safe solid waste management and disposal practices, including unprecedented monitoring of landfill operations, the assessment of all Superfund sites to insure that the remedies remain secure and protective, the distribution of millions of public information fliers, brochures and advisories throughout the area, the development of an extensive website so that people can understand the conditions in their own neighborhoods. And this is but a partialness of the things that we have done and are doing.

We continued today first to support the demolition and proper disposal of debris from what may turn out to be as many as 50,000 structures, most of them homes in this part of the State. And we are fully engaged as well with recovery projects in coastal Louisiana, in the restoration of drinking water and wastewater treatment systems, in facilitating the redevelopment of neighborhoods through our Brown Fields programs, in support of the Louisiana Recovery Authority, and in efforts to stop illegal dumping and much more.

In closing I would like to read a short excerpt from a memorandum I sent only 4 months after Katrina hit to a member of the Inspector General's team who was evaluating our work here. And I'm quoting: "It should be emphasized that EPA is responding to the largest national disaster in history. There is no precedent for what we are doing and our actions are charting the course for response to disasters of this type should they occur again. Any standard review of our actions is not possible, because there is no standard for what we are doing. The employees of EPA and our contractors have conducted themselves in an exemplary manner, working around the clock in heretofore unimaginable conditions that often have placed them at risk for their own safety for the sole purposes of bringing help and assistance to people in need."

Thank you again for the opportunity to participate today. I look forward to whatever questions you may have.

[The prepared statement of Mr. Greene follows:]

STATEMENT OF RICHARD GREENE, REGIONAL ADMINISTRATOR, REGION VI, U.S. ENVIRONMENTAL PROTECTION AGENCY

INTRODUCTION

Good morning, Madam Chairman and members of the Committee. My name is Richard Greene. I serve as the Regional Administrator at the U.S. Environmental Protection Agency (EPA), Region 6, in Dallas, Texas. I appreciate the opportunity to provide you with an update on EPA's response to Hurricanes Katrina and Rita.

T he magnitude of the damage from these hurricanes presented significant challenges for EPA and our partners at the Federal, State, and local levels. EPA has long-standing and positive relationships with the Federal Emergency Management Agency (FEMA), the U.S. Army Corps of Engineers (USACE), the U.S. Coast Guard and other Federal agencies, as well as our partners in State and local governments. As with other Federal agencies, our involvement is facilitated through the National Response Plan (NRP). We believe that these relationships provided the basis for an effective response to the most destructive natural disaster in the history of the United States.

EARLY RESPONSE FOR HURRICANE KATRINA

Beginning on August 25, 2005, EPA sent emergency response managers to the FEMA National Response Coordination Center and State Emergency Operations Centers to prepare for Hurricane Katrina to make landfall. When EPA arrived in New Orleans, it was clear that saving lives was the first priority. EPA responded to FEMA's request for assistance and helped rescue approximately 800 evacuees. EPA sent additional response personnel to the affected areas as soon as travel into the region was possible. At the peak of activities, the number of EPA employees and contractors assisting with recovery efforts exceeded 1,400 in Louisiana. We joined responders in addressing urgent rescue needs by putting over sixty environmental monitoring watercrafts to work as search and rescue vessels. Our field employees and contractors, mostly environmental experts equipped to address oil and hazardous substances releases, joined fire fighters, police, and other first responders and rescued nearly 800 people in Louisiana.

EPA ROLE IN FEDERAL RESPONSE

Under the NRP, EPA is the Coordinator and Primary Agency for the Emergency Support Function (ESF) #10, which addresses oil and hazardous materials. Specifically, our primary activities under this support function include: efforts to detect, identify, contain, clean up or dispose of oil or hazardous materials; removal of drums and other bulk containers; collection of hazardous materials from households; monitoring of debris disposal; air and water quality monitoring and sampling; and protection of natural resources.

USACE is the lead Federal agency for the ESF #3, which addresses public works and engineering, including solid waste debris removal. EPA helped support the USACE by assisting in the location of disposal sites, providing safety guidance for areas affected by hazardous

materials, assisting in the management of contaminated debris, and by coordinating or providing assessments, data, expertise, technical assistance, and monitoring. As prescribed by the NRP, EPA also provides support to other agencies for a number of other Emergency Support functions.

HAZARDOUS MATERIALS

EPA's primary responsibility was the collection and proper handling of hazardous materials. EPA provided technical advice and assistance, facilitated the recycling of more than 940,000 electronic goods. EPA carried out a highly effective program, in conjunction with the USACE, the States, and the local communities to collect and properly dispose of over five million containers of household hazardous materials in Regions 4 and 6. We also assisted in the proper handling and recycling of more than 380,000 large appliances. As part of this effort, EPA assisted the USACE by separating hazardous materials from non-hazardous debris for proper disposal.

DEMOLITION AND SOLID WASTE

FEMA is the primary agency for assistance under the Stafford Act Public Assistance Program which provides supplemental Federal disaster grant assistance for debris removal and disposal. The USACE offers state and local governments support in contracting for these services and for demolition services after local authorities have obtained any required waivers and clearances. To assist the FEMA and the USACE, EPA provided training for local parishes in Louisiana and contractors on Federal asbestos clean-up requirements. EPA also assisted by monitoring activities at over 2,300 demolition sites to help the State ensure compliance with the regulations.

Under Federal law, the permitting and regulation of solid waste is primarily a State responsibility. EPA has promulgated criteria to assist States in defining safe solid waste management and disposal practices. During the response, EPA worked closely with Louisiana to develop "best practices" and protocols for solid waste landfills to screen out hazardous materials, and route them to appropriately designed and permitted hazardous waste landfills for proper disposal. To assist the Louisiana Department of Environmental Quality (LDEQ), EPA provided observers to monitor solid waste landfills around New Orleans to ensure that disposal practices conformed to the established protocols. EPA also established temporary air monitoring locations to replace the State's damaged air monitoring network.

SAMPLING AND MONITORING ANALYSES AND ACTIVITIES

In addition to our efforts related to the disposal and/or recycling of hazardous and solid wastes, EPA used a remote sensing aircraft, known as ASPECT, to locate chemical spills that needed emergency response to protect water quality, and air quality. Additionally, EPA's mobile laboratory, known as the Trace Atmospheric Gas Analyzer (TAGA), conducted real-time air sampling in neighborhoods and near known spills. EPA also conducted more than 400,000 laboratory analyses of water, floodwater, sediment, and air samples. The analyses were made available on the Internet along with an interpretation of the results and recommendations.

To help ensure that drinking water and wastewater systems were properly functioning, EPA assessed over 4000 water systems; provided technical and engineering assistance in evaluating damaged infrastructure for both drinking and wastewater systems; distributed testing kits to private well owners and helped them evaluate the condition of their drinking water wells; and reviewed over 100 restoration projects proposed by parish governments. To further help

communities, EPA assisted in emergency efforts to bring clean drinking water back to the affected areas through monitoring of about 3,500 potable water trucks.

To address floodwaters and sediment, EPA assisted in collecting and evaluating more than 400 floodwater samples; 1,600 sediment samples; and almost 700 soil samples which were sent to the Agency for Toxic Substances and Disease Registry (ATSDR) for analysis. The plans for sampling flood water and sediments underwent an extensive peer review process, including a review by EPA's Science Advisory Board (SAB). The SAB agreed that the sampling could help determine the potential for acute effects from short-term exposure to flood water and sediment. Sampling data were provided to ATSDR and to State and local health officials who used them to make decisions and issue advisories to the public, response workers and other Federal and State agencies.

OIL SPILLS AND HAZARDOUS RELEASES

With respect to oil spills and hazardous releases, EPA responded to 70 emergency situations that presented an immediate threat to human health and the environment, including chemical spills, fires, and other situations. EPA, and the LDEQ, with assistance by the U.S. Coast Guard, conducted assessments at hundreds of chemical and petrochemical facilities and more than 900 public and private schools to determine damage by the hurricane. As a result of these assessments, EPA identified six major spills in the New Orleans area resulting in releases of over seven million gallons of oil. The largest inland spill occurred at Murphy Oil in St. Bernard Parish, where a 10.5 million-gallon storage tank had moved off its platform and spilled about one million gallons of oil that affected over a 3 to 5 square mile area. Murphy Oil is now conducting a clean up of the area with EPA and LDEQ providing oversight. Over 2,700 houses and businesses have been cleaned of oil on the exterior and more than 1,200 houses have had oil cleaned from the interior.

To further track potential hazardous releases, EPA, working together with state health and environmental agencies, conducted assessments of the seventeen Superfund sites located in Louisiana that were potentially affected by Hurricanes Katrina and Rita to ensure that the remedies remained protective.

ENVIRONMENTAL JUSTICE AND COMMUNITY OUTREACH

To address the unique needs of New Orleans, EPA reached out to assist diverse communities devastated by the impacts of the hurricanes. EPA met with the United Houma Nation and local community groups; facilitated meetings between State officials and members of the Vietnamese Community near the Chef Menteur landfill; created an Environmental Justice Interagency Taskforce (EJIT) to bring together local, State, and Federal agencies, universities, and community groups, to exchange information and to address community concerns; and identified full-time staff to address community concerns.

EPA also convened the National Environmental Justice Advisory Council (NEJAC) to provide recommendations on how EPA can better respond to environmental justice concerns related to natural disasters. EPA is implementing several recommendations of the EJIT and NEJAC, such as adding to the Liaison Officer position in the Incident Command structure the responsibility to identify, highlight, and address environmental justice issues and concerns.

Throughout the response, EPA shared information and sampling results with the community through press releases, radio public service announcements, handouts and flyers, and electronically on EPA's web site. EPA also attended community meetings, visited churches and employers, dropped off flyers at post offices, municipal buildings, and local retailers - and stood

at check points delivering information to returning residents. In total, EPA distributed over 3.8 million flyers to people living and working in Louisiana.

COOPERATIVE PROJECTS

EPA is assisting the State of Louisiana through the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) program, EPA has a long history of successful coastal restoration projects, including barrier island restoration in coastal Louisiana. Barrier islands are the first line of defense against hurricane storm surge. The $13 million Timbalier Island restoration project was completed in June 2005 and provided over 273 acres of vegetated dune and marsh, which withstood the Katrina and Rita storm surges. The $10 million New Cut Dune and Marsh Project to rebuild another barrier island is underway.

CONCLUSION

As the State of Louisiana moves forward in the aftermath of Hurricane Katrina, EPA will continue to assist the State by conducting air monitoring, collecting hazardous materials from households, observing landfill and demolition activities, overseeing the Murphy Oil cleanup; and assisting with drinking water and wastewater issues. EPA will continue to work with our Federal, State, and local government partners to address the nation's preparedness for future catastrophic events, such as Hurricane Katrina.

At this time, I welcome any questions you may have.

Senator BOXER. And now, I understand General Riley to not have a statement, but you are there to answer questions, so I will proceed with the questions. We will keep them to 5 minutes of questions and we won't be able to do a second round.

Mr. Woodley, you testified that the corps is currently studying the closure of the MRGO to deep draft navigation. understand that was the task given to you by the Congress. MRGO has seen a steady decline in tonnage and traffic. Both Senators have spoken with all of us at length about this. The overwhelming sentiment of the experts is that MRGO should be closed completely. So my question is: Do you support the closure and rehabilitation of MRGO and should language to permanently close MRGO and rehabilitate the area be included in WRDA?

Mr. WOODLEY. Yes, Senator, the detailed study that would support that decision-making process is underway. The preliminary indication that we have, however, is that the Mississippi River Gulf Outlet is no longer economical.

Senator BOXER. Okay.

Mr. WOODLEY. I would say that although ordinarily our recommendations would await the determination of the final report, I can advise you of our preliminary indications which are a matter of record.

Senator BOXER. Thank you for you succinct answer to this. Would it help you to have this language that the Congress would pass to permanently close MRGO and rehabilitate the area, and get some language in this year's WRDA bill; would it be helpful?

Mr. WOODLEY. I would say that my impression is that that would be justified language.

Senator BOXER. Well, we will work with you on the language.

Mr. WOODLEY. Precisely what the details of the recommendation of how exactly we should go about it, should await the final study.

Senator BOXER. When will the final study be ready?

Mr. WOODLEY. We will be prepared to present that in December.

Senator BOXER. We will talk to you about some interim language.

Mr. Woodley, the administration wants to reprogram $1.3 billion in appropriated funds from critical hurricane flood protection projects in Louisiana to other hurricane and flood protection projects in Louisiana. And what we are a little concerned about is, or at least I am, will the administration commit that if the reprogramming occurs that the full amounts to complete the project? From which the funds are taken will be restored when the cash flow is needed to those projects?

Mr. WOODLEY. Yes, Madam Chairman, that is entirely our intention. Our difficulty is that we are not able today to provide the committee with a detailed cost estimate of the additional work that will have to be done. I intend to be prepared to do so, however, this summer.

Senator BOXER. The important thing for me, and I know the Senators here and all the Senators, is if funds are taken from one project for a cash flow purpose, we want to make sure that you are committed and the administration is committed to getting those funds back for those programs when they are ready for the funds. We don't want half-built projects.

Mr. WOODLEY. I will say, Madam Chair, that the reprogramming is entirely within the work that we have undertaken to provide hundred-year protection for the—protection against what we will term a hundred-year storm for the metropolitan area of New Orleans, and so, while that has historically been regarded as a collec-

tion of different projects, my intent is to manage those projects as a single project. So I would not characterize it as reprogramming from a project in Louisiana to another project in Louisiana. This is in my view a reprogramming within the project we have undertaken to protect metropolitan New Orleans against the threat of catastrophic inundation.

Senator BOXER. I'm just making a point that there will be reprogramming away from certain projects. That's a fact of life. And I just want to make sure that when those programs—when those projects are ready for the funding, we don't have to go back and have these two Senators have to go beg for more funding. I'm assuming that you are agreeing with us that at the end of the day the funding will be there even though you are refunding?

Mr. WOODLEY. That is right.

Senator BOXER. Okay. That's fine. My last question, because my time is running out, is to Mr. Greene. What is EPA doing to address the big problem of illegal dumping? How have you responded to the State's request for help to fight this program—this problem?

Mr. GREENE. We are very concerned about illegal dumping. It is a threat to the community and we are working closely with State and local officials to assist them in monitoring and law enforcement efforts to bring that under control.

Senator BOXER. So you are working with the State, and you feel you are doing everything you can do here?

Mr. GREENE. We have our criminal investigation division working with local law enforcement authorities. We are providing monitoring cameras, visual inspections from the ground, and other forms of assistance.

Senator BOXER. Okay. Thank you. Senator Vitter.

Senator VITTER. Thank you, Madame Chair. Secretary Woodley, thank you for being here and thank you for all of the Corps' continuing work. I want to go back to a few of the issues the Chair has touched upon. One is closing MRGO. First of all, very recently you all issued a new work program with regard to the $75 million we have already provided for restoration, and that was largely out of discussions I had with folks in the Corps to use that money to much more aggressively and quickly move to closure. And I want to publicly thank you for that new plan, because I think it's a vast improvement and is moving toward closure a lot more aggressively.

Now, as you can guess, I want to keep pushing very aggressively in that direction. If the Congress changed the requested date of your study from December to June of this year, could and would the Corps redouble its efforts to finalize the recommendations which you gave us a preview of so we can get on with it?

Mr. WOODLEY. Senator, I can certainly say that we would do everything possible to do that. And that I would have to ask the persons involved in the study as to whether any part of it was—things simply take a certain period of time in order to accomplish.

An example of that would be sometimes we have to give 30 days' notice of a public hearing. You can't give 30 days' notice in 10 days. And so that type of thing may be a problem, but I think——

Senator VITTER. I would ask you to start those discussions in the Corps, because I'm going to be promoting that.

Mr. WOODLEY. Yes, sir.

Senator VITTER. I think your testimony sort of confirms that we all know where we are headed. So my attitude is we might as well get there before the next big event instead of after. I know you share that sense of urgency.

Mr. WOODLEY. Yes, sir.

Senator VITTER. I also want to touch on this $1.3 billion moving-funds-around issue. I have obviously made my views known on all that. I have a real hesitation with robbing Peter to pay Paul. The Chair said, and was very persistent in asking you, will we have funds at the end of the day for those other projects.

Madame Chair, my concern is how long that day is, and because it could be a reasonable period of time or it could stretch these projects out into the future unreasonably. What I have proposed is getting an additional $1.3 billion at least this budget in order to fund those vital west bank projects without robbing from the east bank projects. What is the—apart from the OMB sort of number crunchers who don't want any dollar figures to go up, what is the possible objection to that if at the same time you are giving additional language that gives you flexibility to move money around within the region to do whatever work is tee'd up to be done?

Mr. WOODLEY. My only objection would be that if that is an action that would take place in the course of the normal budget cycle, and under which an appropriation act would not be passed until later in the year, it will delay our issuance of contracts. Our request is for an immediate emergency action to prevent our having to delay issuance of contracts that are ready to proceed.

Senator VITTER. But this proposal that was made by the administration to move the money is in the context of the new proposed budget, so that's on the same timeline I'm talking about.

Mr. WOODLEY. I did not think so, Senator. It was presented at the same time but it was presented in a different context, which would allow the Appropriation Committees to act on it more swiftly, and that is our request to them.

Senator VITTER. Could not the appropriation committees do what I'm talking about along the same timeline?

Mr. WOODLEY. Absolutely. They certainly could, Senator.

Senator VITTER. Thank you. I want to also underscore the importance of pumping capacity at the outfall of canals. That's a continuing concern that we all have, I know you share it, that it's very important.

And now, quickly, just a few questions, Mr. Greene, because I'm very concerned about this landfill issue. As I understand the EPA's position, you have largely deferred on these landfill issues to the Louisiana DEQ; is that correct?

Mr. GREENE. Thank you, Senator. We are very much aware of the concern in the community and our responsibility to ensure safe and proper operation of the State-authorized landfills. You and Senator Landrieu have both discussed that with me personally, so I know of your long concern, your ongoing concern. And we are doing everything that we can within our jurisdiction to maintain very close supervision of these operations; in fact, supervision like this has never been done before anywhere.

Senator VITTER. Well, as I understand your main attitude, you have largely deferred the decisions to the State level because C&D-

type debris, which is what we are talking about, is generally regulated there. My concern is that the State, in fact, is using an expanded definition of C&D, not a normal definition under emergency orders, and that contains things like asbestos-containing material. So, in fact, aren't you perhaps deferring or passing the buck inappropriately, since we are not talking about traditional C&D, we are talking about other stuff including asbestos-containing materials?

Mr. GREENE. Senator, a very close supervision of the separation of hazardous materials at the site of the pickup and its origin is the best way to ensure that does not go to the wrong kind of landfill. And then the close supervision of what is deposited in the landfill is further a check and balance including the instruction to remove any improper items from that landfill.

Senator VITTER. But it is acknowledged by everyone, including the Louisiana DEQ, that asbestos-containing material, other similar material outside the normal scope of C&D is going to that landfill, correct?

Mr. GREENE. Well, to the extent that it is allowed to go to that landfill because it was not regulated asbestos material and it was already lying on the ground and considered to be C&D waste. But even unregulated asbestos material is being handled in an appropriate manner and taken to enhanced areas within the landfill, zones in the landfill that are designed to receive that kind of waste. Such maaterial, which has been hopefully wrapped and protected further, is then buried, which is what you would like to see happen to asbestos in a safe manner to keep it out of the atmosphere.

Senator VITTER. We will get into this more in Panel 2, but I have a real concern in doing that in an unlined landfill when we could be bringing it to lined landfills for the same or less cost in the region.

As you know, the old Gentilly site was an illegal dump that was closed down. The capping process hasn't been completed, berming process hasn't been completed, corners have been cut under emergency order of Louisiana DEQ. And I honestly think it is bad policy being promoted locally by politics and money and not considerations o the public good. So I would urge the U.S. EPA to renew and heighten its supervision.

Mr. GREENE. Thank you, Senator. We share your concerns. Our twice-a-week inspections and extensive reports that are written and review of the records in the operations will continue and we will work hard to insure that those operations are proper and protective of human health.

Senator BOXER. I want to just remind Senators, if they can possibly keep to the five minutes, if you can, and we will leave the record open, Senator, for a week so that you can get more detailed questions to all of our witnesses. I know I have some myself.

Senator Landrieu.

Senator LANDRIEU. Thank you. There are many important issues at this hearing and our time is short but I've got to get back to this $1.3 billion, General Riley, because not only is it a significant amount of money that we are depending on to continue to build projects on the east bank and west bank, and as I said, protect this entire region but I want to pursue this.

You have testified, Secretary Woodley, that it's your intention find an additional $1.3 billion. But is it in your mind, on the minds of the administration, to request an additional $1.3 billion either through the supplemental, which we are considering now, or are we just going to borrow $1.3 from one set of projects and then hope someday in the future the money will come.

And, General Riley, what have you been told about an additional $1.3 billion in supplemental, if anything?

Mr. RILEY. Ma'am, what I have been told by the Administration and meetings in the White House is the president is committed to fully funding the 100-year-level protection through the normal budgeting process. What we have right now is four and a half billion dollars——

Senator LANDRIEU. In the normal budgeting process or the supplemental?

Mr. RILEY. Through the budgeting process.

Senator LANDRIEU. So not through the supplemental?

Mr. RILEY. The reappropriation request is through the supplemental. We have four and a half billion dollars that is unobligated so there is funding there now to proceed.

Senator BOXER. This is for the record, the committee knows this well, but for the record. If this additional $1.3 is added to the supplemental then I will support it because it's emergency funding and it's not counted anything against in the budget. If it has to go through the regular budget process, we have to find $1.3 billion projects from somebody else, take it away from them and use it for ours. And in these days, those days are over with, so I want to go firmly on the record that we will fund this through the supplemental appropriations process, not through the regular process because otherwise we will never get the money. And I'm going to take the President at his word when he stood at Jackson Barracks and said he would fund it.

And I would like to go on record now, Madame Chair, that we will fund it through the supplemental.

No. 2, you mentioned in your testimony, General Riley, that you believe that we should move to a more independent way of funding over time this major project that we have underway, which could exceed $30 billion in scope. As the Chairman said, a combination of levees, wetlands, pumping systems, all integrated to support navigation, oil and gas protection, the running of the port that gets the goods from Minnesota and gets it out to the rest of the world. What exactly is the Corps proposing so that we can, for the first time in the history of this country, act this way and not give people false hope?

Mr. RILEY. Well, ma'am, of course, we haven't completed our proposal, but what we are looking for is not only to design it as a system but to build it as a system and operate it as a system. As you know with that large amount of funding over a long period of time, there is a lot of uncertainty out there. We have to have the flexibility with the State partners to adjust as we move along and if it's appropriated in pieces of projects then we don't have that flexibility. We would ask for not only to build it as a system but appropriate it as a system, and I defer to the Secretary for clarification of that.

Senator LANDRIEU. Very quickly, do you have anything to add?

Mr. WOODLEY. I will say this, Senator, that I believe you will find that when we are prepared to present this as an entire package that our request will actually exceed an additional $1.3 billion.

Senator LANDRIEU. I can promise you it's going to be a lot more than $1.3 billion. This project over time is going to be north of $30 billion, which is why we had to secure a new and substantial revenue stream as well as making within this committee's jurisdiction a more expedited and coordinated process. I hope for the record that you all are working closely with the parishes on their internal pumping capacity, because as we flew over those canals this morning, obviously if you close canals to keep storm surge out but you don't have the pumping capacity adjusted correctly, all you are doing is going to flood Jefferson and Orleans and Plaquemines and St. Bernard from rainwater. And then finally, if EPA could—real quickly, why was the decision made that X amount of debris could be taken to a landfill that FEMA approved and then the Environment and Public Works approved a different amount? And who has jurisdiction over deciding in a catastrophe? Does EPA control or FEMA control?

Mr. GREENE. Senator, the landfill operations that we are talking about are all under the State jurisdiction and they are managed and operated by the State. And our role is oversight and review and support for what they are doing. And I think your question has to do with the various changes that have occurred and the amount of waste that has been allowed to go particularly to the Gentilly landfill. And that number has changed based on events. And there was even a legal action that resulted in a resolution of how much the limit should be and then the Corps got some instructions from FEMA about limiting their use, so those numbers have changed over time.

Senator LANDRIEU. It's very important, Madame Chair, and I will take 30 seconds, for us in a catastrophe when we are dealing with this kind of waste to, first of all, clarify who's the final authority. Is it the local EPW, is it the Federal EPA or does FEMA get to regulate volumes based on what they choose to reimburse or not? And the record from what I have read is unclear and this committee could go a long way in helping us figure that out. Thank you.

Senator BOXER. Thank you. Before I call on Senator Isakson, I want to make a point here, General Riley. I know you mean nothing but well here, but the fact is a typical level for a construction account for the entire country is $2 billion in a year. So if you think it's going to be easy in the regular appropriations now to increase a $2 billion authorization by $1.3 billion, it's just not in the realm of possible. So what you need to do is consider what these Senators are saying about restoring this in the emergency supplemental or people around here are going to be very skeptical. And that's the last thing that we need is to have skeptical people saying: Well, just go to regular appropriations process when, in fact, it would mean essentially almost doubling the amount and it's just very tough to do that. And I wish we could do that, but it just doesn't happen in a year when everyone says we have to reduce deficit.

Senator ISAKSON. Thank you, Madame Chair. General Riley, first of all I want to commend you, after watching or seeing 17th Street

Canal project, the gates, lifts, pumps, all the construction, you have demonstrated great capacity in a relatively short period of time, I think in 13 months you told us last night. Secondly, there is someone who will testify later who begs the question and you are not going to be around to answer it so I thought I would ask it because it helps me to understand. Mr. Thomas Jackson in his printed testimony says the drainage canals throughout St. Bernard Parish are clogged with swamp grass that floated into homes and drainage canals by the hurricane. The grass is blocking the drainage canals and breaking rakes at pumping stations and continuous pleas from their executive director to you to clean that up have gone unanswered. Are you all getting those pleas and where does your responsibility begin and where does maintenance responsibility end?

Mr. RILEY. Yes. Certainly we listen to those pleas, and when we get them we work with FEMA. That type of work in a standard emergency would come under a mission from FEMA to us. As it affects the flooding capacity or flood fighting then we are directly under our authority, and we can act on that. We will work very closely with them to determine where the best authority lies and then to work with the problem.

Senator ISAKSON. But in non-emergency times, when FEMA is not around, the Corps has certain responsibilities in terms of the levees and the canals. But so, too, does local authority. Is maintenance of things like debris pretty much a local responsibility?

Mr. RILEY. Yes, sir, that's correct. As we turn over any system to the local authority. So interior drainage canals, that's by the Sewerage and Water Board.

Senator ISAKSON. It is a Federal-local partnership?

Mr. RILEY. Yes, sir.

Senator ISAKSON. Mrs. Woodley, in the staff prepared remarks according to what we learned last night at the IMAX theater and all the education we got, it took 5,000 years for the Mississippi Delta to develop primarily from the overflow of the Mississippi River. And then when we began to restrict that by building the levees. Since that period of time we have lost 1.2 million acres of land and we estimate might lose 500 square miles in the next 50 years. As we are reconstructing the levees and as we are putting in the pumping systems, what are we doing to accelerate the natural assets to reconstruct or renew those wetlands?

Mr. WOODLEY. Senator, that is an effort that was ongoing in partnership with the State of Louisiana and in partnership also with many, many interested persons from around the country to find out the ways in which we can use the resource of the Mississippi River, the fresh water that it represents, the sediment and silt that it carries and begin to use that to fight against this loss of wetlands along the Louisiana coast. And s it is another matter, as Madam Chair knows, that is awaiting your decision under the Water Resource Development Act.

Senator ISAKSON. How much time do I have left?

Senator BOXER. You have a minute 24.

Senator ISAKSON. Just real quickly, Mr. Greene. I understand at the Gentilly landfill there is not a leachate collector or lining system?

Mr. GREENE. Well, the Gentilly landfill operation currently is being conducted on top of the cap for the old landfill that was closed underneath it, so that cap provides the protective barrier for the new waste that's going in there.

Senator ISAKSON. Is it impermeable or does it have collector system?

Mr. GREENE. It meets the minimum requirements and beyond of the C&D landfill base.

Senator ISAKSON. I expect from flying over that area this morning, the water table is pretty high around that landfill; is that correct?

Mr. GREENE. Well, I don't know the height of the water table, Senator, but the monitoring wells and close supervision and the testing that has been done and continues to be done addresses all those kinds of questions.

Senator ISAKSON. Thank you, sir. Thank you, Madame Chairman.

Senator BOXER. Thank you, Senator.

Senator CARDIN. Thank you, Madame Chair.

I was listening on the exchange of the $1.3 billion and I serve on the budget committee in addition to the Environment and Public Works committee. I think it raises two concerns. I understand the Senator's concerns about the fact that $1.3 billion was appropriated through supplemental emergency appropriations for the tragedies in this region. But when you reprogram it, it seems to me that you are also allowing emergency funds to be used for other purposes, which is not really what the budget act was all about. So I think it's not only an issue that may very well be of concern to where that money comes back to these projects, but whether, in fact, this is the right way in which to show offsets if this money is going to be used for other Corps' programs.

Mr. WOODLEY. Senator, that should be very clear. The money is being used for other matters that were also funded in the supplemental but for which the funding in the supplemental was inadequate and which are now of a higher priority, that is to say because we can use the funds at this time.

Senator CARDIN. I understand that.

Mr. WOODLEY. It's not a question—we have no question of changing the funding from a matter that was funded in the emergency supplemental to something that was not funded in the emergency supplemental. That is, we have no concept of doing such a thing as that.

Senator CARDIN. Well, I would caution that when you have offsets, a different standard is used in evaluating whether it truly is an emergency request or not. There have been a lot of issues included in the supplemental that have not been as strict as they should because it's not subject to offsets.

I think the main point here is whether New Orleans is going to get the money it needs and I agree with my colleagues that it's going to be difficult, if not impossible, to get that through the normal appropriation process, and I think that's the major focus, but I would also say it could cause a problem as to proper budgeting. We will take a look at that.

Let me get back to the point that Senator Isakson mentioned about the erosion of our wetlands and the natural buffers to the problems of flooding in this area, the speed bumps, so to speak. We were impressed by that as we flew over today. I just want to know whether we have a game plan here? I understand you are waiting for us to act, but is there a game plan? Are we trying to stop the erosion? Are we trying to increas the amount of wetlands? What is our objective here? We have an objective as far as the levees are concerned. We want to ge to hundred-year flood protection. Do we have an objective as to what we are trying to achieve as far as the wetlands are concerned, General Riley?

Mr. RILEY. We do have objectives and we are not in all cases waiting on Congress. We have the Breaux Act in place and those are small scale demonstration projects which are proving very fruitful. We have the LCA study, Louisiana Coastal Authority, that is awaiting authorization. And we also—you have authorized and appropriated funds for the Coastal Louisiana Protection Study, which is more of an umbrella study to look at the integration of coastal wetland restoration as well as hurricane protection and flood damage. So that's our objective and the objective as far as it pertains to coastal wetland restoration is to immediately do what we can to stop the erosion and then to begin where we can, with the State and all the local partners, begin to restore some of those wetlands that have been lost. We have a pretty clear vision about where we want to head with that.

Mr. WOODLEY. Senator—before we leave the topic, let me say that I fully take your point and understand your point and the other Senators' with respect to the mechanism that we use for funding, and I will say that the decision to seek another, seek this additional funding through another supplemental is a decision that would be made with the higher levels, with the executive branch in consultation with the leaders of the Congress as appropriate. I can only speak to the the methodology, whether supplemental—I certainly agree with the point that a supplemental offers many advantages. Whether it's some other mechanism, that is not my decision. I know what I will be advocating for, but that's another thing. I can testify to the Administration's commitment to seek the funding at the appropriate time to move forward on this vital work. We do not intend—in fact, the movement of funding is intended to accelerate the work, not intended to retard any other work, so that is——

Senator CARDIN. Madame Chairman, I know my time is expired. I know we need to move on. I just hope on the funding issues, I hope you can get more specifics as to objectives on the wetlands restoration. I think that's critically important that we have that.

Senator BOXER. Thank you. I agree, Senator Cardin.

Senator Klobuchar.

Senator KLOBUCHAR. You know, when I think back of what so many lived through and we saw the images on TV of the people stranded on the roofs and so many poor and I always thought of these as sort of a mirror on the leadership of this country and now how we proceed from here is going to be a mirror on the leadership of people up here as well as all of you and so, in your testimony, Secretary, when you talked about how the key challenge that we

have here is to integrate all the activities into a coherent, comprehensive plan. And we talked about——

Senator Landrieu talked to General Riley about the way this is funded and some of this is how Congress has behaved over the years. Some of this is because some of the local issues and people not getting together. But I heard the other day that the way the Corps makes its decisions on priorities is based on whether or not they enhance the value of the land. Is that correct?

Mr. WOODLEY. In the past, in a flood control arena it's not so much to enhance the value of the land as the value of the property that would be damaged in the event of inundation balanced against the cost of the protection.

Senator KLOBUCHAR. So it's a cost benefit analysis? Does it consider the value of human life?

Mr. WOODLEY. It does not. And let me say that the work we are undertaking for New Orleans is not being analyzed on a cost benefit basis.

Senator KLOBUCHAR. Do you think that should be done differently?

Mr. WOODLEY. I believe that we are desperately in need of reform in the way that we justify flood damage reduction works across the country, yes, I do.

Senator KLOBUCHAR. The September 2006 GAO report found that the Corps is proceeding with over $7 billion of interim repairs and construction without a comprehensive strategy and implementation plan to insure that these various efforts are appropriately coordinated and integrated and talked about a piecemeal approach. And again, we talked about the fact that this is a number of factors, some in your control, some outside of your control. But could you tell me how you think we can fix this?

Mr. WOODLEY. I believe that we have come a long way toward fixing that already, Senator. I think we have a plan now to reach the hundred-year protection level. Going beyond that, we have an authorized study to determine the feasibility of providing higher levels of protection. And so what we don't have is all of the information in place that would allow us to present this plan as a fully coordinated and fully informed plan to the Congress. But we have a timeline and a schedule to achieve that and I believe that that is on track and is imminent.

Senator KLOBUCHAR. What do you see as the mistakes in the past about how Congress has funded those things, both and you General Riley, and how we should change things?

Mr. RILEY. Ma'am, if I could take the first part of that. I think what we saw is how we, in the emergency supplemental right after the storm, appropriated certain pieces and certain projects. We now see that we should have asked for a system not only designed in the plan that approached through authorization and appropriation, so the $1.3 billion appropriation request is a first attempt to let us take a look at the system and raise the system up to a level of protection together across the board rather than the piecemeal approach.

So where we are proceeding with the higher levels of protection past 100-year is a very comprehensive, systematic approach inte-

grating all the structural and non-structural solutions. And we will present then a comprehensive plan for that.

Senator KLOBUCHAR. Anything, Secretary Woodley?

Mr. WOODLEY. The history of the planning process within the Corps of Engineers has been that it has been very much project specific. It has been limited in geographical scope, and then in this area and in others the different pieces have proceeded at different rates in part because of the controversy surrounding certain parts of the system, but also because, in part because of the different abilities of local partners and local sponsors to provide their share of the funding. Very important process, very important principle of civil works in the Corps of Engineers is that, generally speaking, we will proceed in partnership with a local authority and on behalf—on a basis of cost share with the Federal paying 65 or perhaps 75 percent, the local contributing 35 to 25 percent. And that is a very important principle. That was established in the 1986 Water Resource Development Act, and it has reaped many benefits because of the way it integrates the local interest and the local needs into the national system. However, Senator, it has all the vices of its virtues.

Senator KLOBUCHAR. I see.

Mr. WOODLEY. And our effort now must be to find out ways to reform that system while maintaining its virtues and mitigating its vices.

Senator KLOBUCHAR. We look forward to the second panel to hear about the way—the need to coordinate better the local with the Federal, so thank you.

Senator BOXER. Senator Whitehouse.

Senator WHITEHOUSE. In a significant public works project, a dam or a bridge or power plant or something like that, there is ordinarily a critical path diagram that lays out the order of priorities and timing of the key elements of the project. Given all that's happened and how many different moving parts there are, is there such a thing for the hurricane recovery and where would I go to see it?

Mr. WOODLEY. Yes, sir, we could give that to you.

Senator WHITEHOUSE. What does it look like? Give me a preview of coming attractions.

Mr. RILEY. Sir, if I could take that one. Of course, there's the staff right behind me working here, the Task Force Hope in the district. We have the rudimentary pieces of that over time because of all the pieces that come on that. The critical path really is the permanent pump stations at the lake right now. Those would take the longest duration. Not the most critical, because there is a temporary fix in place that doesn't quite yet have the pumping capacity yet. But that's the essential critical fact. The next thing closest to that would be gates at the inner harbor. As you flew over that today, you saw repair of the levees and the flood walls, but there are other flood walls that are lower than authorized. So the best way is to close the navigable gates at either end of the inner harbor. So those are the two things that would take the longest time.

Senator WHITEHOUSE. But there is a critical path analysis that all of the major players and stakeholders are aware of and have bought into at this stage?

Mr. RILEY. No. I can't guarantee that, Senator.

Senator WHITEHOUSE. Which part?

Mr. RILEY. We have work to do to partner with all of the stakeholders to make sure they are part of it.

Senator WHITEHOUSE. The bought into part is the part that's not accurate about my hypothesis?

Mr. RILEY. That's correct.

Senator WHITEHOUSE. Thank you.

Senator BOXER. Thanks, Senator. Thank you. Here is the thing. I think you have heard from all of us in our different approaches that we still all believe there is an emergency here. Now, if $1.3 billion worth of projects was an emergency to do, it's still an emergency to do. So for you to sit here and say go to the regular appropriations process for $1.3 billion that you deem to be an emergency already says either it was an emergency, it was not when you declared it so, which we know it was, we all know that, or you are just shrinking back for some reason that may deal with taking on OMV or whatever it is. We would hope and urge and request that you let us know, honest to God, what you need because otherwise, we are not going to be successful.

So I think the message from all of us here is, please, tell us what you need to get this job done. Don't sugarcoat it. Shake off any bureaucracy because we are still in an emergency. When we fly over this city and we see the things that we saw and narrated by your two Senators here with emotion and feeling as only they could bring to it, we believe there is still an emergency here. So that's really our message to all of you and we will follow up with questions.

We thank you very much. We are going to move to Panel 2. We are going to then go to 3-minute rounds of questions because we are, in fact, running a little bit late. It's surprising that Senators have a hard time keeping it to just a few minutes, but that's a fact.

So we call on Panel 2. Mike McDaniel, Secretary of the Louisiana Department of Environmental Quality, Father Vien Nguyen of Mary Queen of Vietnam Church and Wilma Subra for the Subra Company. And we will hold our questions to 3 minutes and we welcome you and will hold your statements to 5 minutes.

Welcome. And unless you have come up with a another plan, I was planning to start with Mr. McDaniel, is that all right, and move our way down the panel.

Mr. McDaniel, please proceed and the clock is over there. We will inform you when your 5 minutes are up.

STATEMENT OF MIKE McDANIEL, SECRETARY, LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

Mr. MCDANIEL. Thank you, Madame Chair. I'm Mike McDaniel, secretary of the Louisiana Department of Environmental Quality. My testimony today is going to be necessarily condensed, however we have provided the committee with additional written testimony and supplementary exhibits, which will be helpful to those interested in learning more about LDEQ's activities in response to the hurricanes as well as lessons learned from our experience.

The LDEQ's responsibility under the Louisiana Emergency Operations Plan are limited primarily to what we call ESF10, which is

oil spill, hazardous materials and radiation. However, as detailed in my written testimony, the department responded to a broad range of needs immediately following the storms, including search and rescue, reconnaissance damage and environmental threats assessment, environmental sampling and assessment, hazardous and radioactive materials management and, of course, debris management.

Hurricanes Katrina and Rita left in their wake over 62 million cubic yards of debris. In addition to vegetative debris and demolished structures, there were around 150,000 flood-damaged homes, around 350,000 abandoned vehicles, and about 60,000 abandoned vessels to be dealt with.

In accordance with National Emergency Response Plans the U.S. Army Corps of Engineers has been assigned primary responsibility for the management of debris from the hurricanes. Although the LDEQ has no directly-assigned responsibilities for debris management under this plan, we do have statutory responsibilities for the regulation of solid waste and protection of the environment.

From the onset we have worked with the corps providing technical and regulatory assistance from their debris mission activities. Perhaps our most important roles have included working in conjunction with local Governments to identify and approve sites for debris management and to approve or provide oversight to see that the debris is handled and disposed of in an expeditious and environmentally sound manner.

It is important to note that LDEQ does not direct waste to any disposal facility. With the exception of the slow pace of demolition of flood-damaged structures, the cleanup and disposition of hurricane debris has gone reasonably well. The debris cleanup and disposal in the Rita-impacted portions of the State are essentially complete. Cleanup and disposal in the Katrina-impacted areas is about 80 percent complete with the remaining debris associated primarily with the demolition and disposal of flood-damaged structures. At least 30,000 homes in both St. Bernard and Orleans Parishes have been identified for demolition and disposal. This number could potentially increase.

The pace of the demolition is tied primarily to authorizations provided by locals Governments. Although not within its defined missions in the State plan, LDEQ volunteered to manage the contract for recovery, remediation and recycling of vehicles and boats. There have been some challenging issues, but we presently expect these efforts to be complete in August of this year.

Although the debris mission has gone reasonably well it has not been without some challenges for LDEQ. Perhaps generating the most attention were the department's approval of the Gentilly and Chef Menteur sites for landfill disposal of hurricane-generated construction and demolition debris. The LDEQ's decision to approve these facilities was based on a thorough evaluation of the need for, suitability of and proximity of these facilities to the hardest hit areas. Both of these sites have previously gone through technical evaluation and permitting process prior to the hurricanes. The rationale for use of these facilities is detailed in the decisional records included in the written testimony we have provided.

The concern about hazardous or prohibited materials being introduced into these sites have been addressed by an unprecedented program of oversight and inspection, which is also detailed in our written materials.

Finally, I would like to briefly share with you some lessons learned. I will provide examples of what went well, what needs to be improved and conclude with recommendations for you to consider in preparation for the next disaster.

Unified command center instant management team collaboration and coordination worked exceedingly well for those local, State and Federal agencies dealing with the environmental issues following the storms. I think it could be a good national model. It was an efficient and effective means to address issues overlapping multiple jurisdictions. Additionally, I don't think we could have asked for better working relationships than those we enjoyed with EPA Region 6 and the members of the Corps of Engineers debris management team.

On the other hand the relationship with FEMA was mixed. At times they were responsive and helpful, however, for the most part they were slow to act and inconsistent in their decisions. Most frustrating to us was their intrusion into the debris management arena, ignoring the findings of DEQ and EPA, independently commissioning outside contractors for studies and redirecting waste disposal by imposing funding restriction. This confusion responsibility needs to be addressed at the Federal level.

There were a number of issues concerning regulatory flexibility during emergency response and recovery.

Senator BOXER. Sorry, sir. I'm going to have to ask you to complete that thought. Complete that thought and then move on.

Mr. MCDANIEL. May I complete with a request?

Senator BOXER. Yes, please.

Mr. MCDANIEL. That is, after having gone through the experiences we have gone through here, the one thing I would ask that you consider is putting together some kind of Federal playbook that provides the guidance in waste management and regulatory flexibility and other matters so that the next poor souls that have to deal with this have a head start.

Senator BOXER. Thank you very much, Mr. McDaniel.

Reverend, welcome.

[The prepared statement of Mr. McDaniel follows:]

STATEMENT OF MIKE MCDANIEL, SECRETARY, LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

I. INTRODUCTION

The Louisiana Department of Environmental Quality (LDEQ) appears before the United States Senate Environment and Public Works Committee to provide testimony regarding response actions taken in the aftermath of Hurricanes Katrina and Rita to protect public health, safety, and welfare, and the environment, with emphasis on hurricane debris management.

The testimony below will briefly describe the devastation caused by these hurricanes; provide a summary of the response actions taken by the LDEQ working in coordination with its federal, state, and local government partners to protect the public health, safety, and welfare and the environment; provide an overview of LDEQ's responsibilities for tasks (with particular emphasis on the debris management mission); describe the collaborative process utilized by debris mission partners to authorize debris management sites; and provide a detailed explanation of the

basis for LDEQ authorizations for two specific sites, the Gentilly and Chef Menteur Landfills, to receive hurricane related construction and demolition (C&D) debris.

Based on lessons learned from the combined Katrina and Rita disasters, the LDEQ will also describe events and processes that worked well and those that did not and make recommendations for plans and actions that are needed to address future disasters in an environmentally sound and efficient manner. Finally, the LDEQ will explain its plans to address the hurricane related increased illegal dumping that continues to prevent proper solid waste disposal in the New Orleans metropolitan area as it struggles to recover from these two hurricanes, and request resources to address illegal dumping resulting from this disaster.

II. BACKGROUND

A. Hurricane Katrina

On August 29, 2005, Hurricane Katrina struck the Louisiana gulf coast, causing widespread damage within 25 Louisiana parishes. Hurricane Katrina has proven itself to be the largest and most costly disaster to date in American history.

B. Hurricane Rita

On September 23 and 24, 2005, Hurricane Rita struck Louisiana, causing widespread damage to an additional ten parishes in the southwest portion of the state, and in addition causing further damage within a number of the same parishes devastated by Hurricane Katrina, notably the City of New Orleans, and Jefferson, Plaquemines, St. Bernard, and St. Tammany Parishes.

C. Impacts

The devastation caused on the Louisiana-Mississippi Gulf Coast by Hurricanes Katrina and Rita in August and September of 2005 cannot be adequately described in words. Statistics are useful but do not convey the experience of living through the violence of the storms and then, for survivors, the revelations of the aftermath. Many people's feelings mirrored the devastation of the natural and manmade environment around them—an environment ravaged by wind and water. More than 1,400 Louisiana residents lost their lives due to Hurricane Katrina, its approach caused the first mandatory evacuation in New Orleans' history, and it caused $1.3 million persons to leave their homes in south Louisiana. More than 200,000 Louisiana residents are still displaced.

While the damage done by the floodwaters was extensive, the weight of the water also caused damage. The two hurricanes poured 480 billion pounds of water into the city, resulting in about 80 percent of New Orleans being submerged for almost a month. The city's infrastructure, including hundreds of miles of underground utilities—electric, gas, water, drainage, cable, and phone lines—was damaged by the water's weight as, simply stated, portions of the city collapsed. Entire areas were pushed even further below sea level.

Altogether, these storms combined to generate over 62 million cubic yards of debris, enough to fill the Louisiana Superdome more than 10 times.

To address the unprecedented level of disaster caused by Hurricanes Katrina and Rita, a coalition of federal, state and local agencies formed under the National Incident Management System's Incident Command structure to respond to the emergencies. The LDEQ participated in numerous operations in responding to the disasters. Although LDEQ has no directly assigned responsibilities for debris management under the state's Emergency Operating Plan, the LDEQ does have statutory responsibilities for the regulation of solid waste and protection of the environment. From the onset, the LDEQ has been engaged extensively with the United States Army Corps of Engineers (Corps) providing technical and regulatory assistance for their debris mission activities. Perhaps the LDEQ's most important roles have included the identification and approval of sites for handling and disposal of debris and to provide oversight to see that the debris is handled and disposed of in an environmentally safe manner.

Although recovery continues for the New Orleans metropolitan area, as of January 19, 2007, the United States Department of Homeland Security, Federal Emergency Management Agency (FEMA) reported that it had spent more than $30 billion in federal funds on response and recovery activities related to Hurricanes Katrina and Rita.

D. Expectations

For those members of Federal, State, and local Government called into action, the public's expectations of government was a primary consideration. With regard to the enormous amount of hurricane generated debris blocking roadways, downing power lines, and damaging buildings, preventing the return to normalcy, the public ex-

pected that the debris would be removed quickly and safely so that recovery could begin. Hurricane Katrina has led to the largest clean-up in U.S. history so far.

Faced with such a situation, all levels of Government expect to work together within the incident command and emergency response structure to hammer out a coordinated plan of response that provides for the efficient removal and management of the hurricane generated debris and that is protective of human health, safety, and the environment.

E. Government Response to the Hurricanes

Preceding landfall of Hurricanes Katrina and Rita, Louisiana Governor Kathleen Babineaux Blanco issued declarations of emergency on August 26 and September 20, 2005, respectively, due to the imminent threat of high winds, torrential rain, flooding, damage to private and public property, and risk to the safety and security of the citizens of Louisiana. In the aftermath of each hurricane, the Governor extended the state of emergency due to the extreme damage caused and the continuing disaster and emergency conditions in the affected areas.

The Federal Government responded similarly, with presidential and FEMA declarations of emergency. On August 29, 2005, in response to Hurricane Katrina, FEMA issued a Disaster Declaration covering south Louisiana. On September 21, 2005, the President of the United States declared that an emergency existed in the State of Louisiana and authorized FEMA to mobilize and provide equipment and resources necessary to alleviate its impacts in response to Hurricane Rita.

F. LDEQ Emergency Response Activities

Consistent with the National Response Plan and the National Incident Management System, Louisiana's Office of Homeland Security and Emergency Preparedness (now GOHSEP) has a detailed Emergency Operations Plan. In this plan, LDEQ's responsibilities are contained primarily in Environmental Support Function 10 (ESF-10)—Oil Spill, Hazardous Materials and Radiation. LDEQ plays a support role in oil spills, but provides personnel and resources in the oversight of spill mitigation. LDEQ plays a support role in hazardous materials management. The Louisiana State Police has primary responsibility in this function during the emergency phase; however, LDEQ is responsible for the collection, removal, waste classification, transportation, and disposal of the hazardous disaster debris and wastes. LDEQ has primary responsibility for managing radiation issues.

LDEQ began assembling an Incident Management Team (IMT) at the LDEQ Headquarters, Galvez Building immediately following Katrina's landfall. A Unified Command Center (UCC) was established to house and support the IMT. In addition to LDEQ, the UCC contained representatives from the United States Environmental Protection Agency (EPA), Texas Commission on Environmental Quality, Corps, US Coast Guard, National Oceanic and Atmospheric Agency, US Geological Survey, Louisiana Oil Spill Coordinators Office, Louisiana Department of Health and Hospitals, and local governments.

Although the LDEQ's responsibilities under Louisiana's Emergency Response Operations Plan are limited primarily to ESF-10—Oil Spill, Hazardous Materials and Radiation, the LDEQ responded to a broad range of needs immediately following the storms including:

- Search and rescue—Teaming with the Louisiana Sheriff's Association, LDEQ employees aided in the rescue of approximately 480 people from the area impacted by Hurricane Katrina.
- Reconnaissance, damage and environmental threats assessment including: industrial sites, oil spills, wastewater treatment plants, rail cars, barges, radioactive materials locations, drinking water sources and intakes, underground storage tanks, ruptured pipelines, superfund sites, access routes, and photo documentation. Aerial reconnaissance was used to provide an initial evaluation of the status of industrial sites, water and wastewater treatment plants, rail cars, ships, barges, radioactive material locations, National Priority List (Superfund), and known hazardous materials sites. In addition to high resolution aerial photography and satellite imagery, also utilized were the EPA ASPECT aircraft, the Department of Energy's airborne radiation detectors and a helicopter mounted HAWK camera. Hazards such as oil spills and gas releases were photo documented and potential access routes were evaluated to assist first responders and for follow-up ground assessments.
- As facilities and sites became accessible, ground assessments were made of all potential sources and known releases of hazardous materials. Drinking water sources were evaluated for contamination and the operational status of water and wastewater treatment plants were determined. In many cases multiple visits to sites were made in order to ascertain that potential hazards had been secured. For example, 383 visits were made to 258 radiation source licensees in order to verify

that all of the radiation sources had been secured. To date, more than 6,000 damage assessments have been made.

• Environmental Sampling and Assessment: with EPA and other partners, thousands of environmental samples were collected including floodwaters, Lake Pontchartrain and surrounding coastal areas, Mississippi River, sediment and soils, seafood, and air quality. Over a million individual analyses were performed and data and health risk assessments presented to the public on EPA and LDEQ websites.

• Hazardous Materials Management—With valuable assistance and resources provided by EPA, over 22.4 million of pounds of hazardous materials were collected and removed from waste streams for proper treatment and disposal. Over a million white goods such as refrigerators, 956,000 electronic goods, and 250,000 small engines were collected and sent to be recycled. Over 4 million orphan containers—many containing hazardous materials- were collected and processed for recycling or disposal. Over 110 school laboratories were cleared of hazardous materials.

• Debris Management—The LDEQ has no assigned role in ESF-3, Public Works and Engineering, which addresses storm debris management. However, it does have statutory responsibilities for the regulation of solid waste and protection of the environment and has been engaged extensively with the Corps, the Federal agency providing assistance to the state in storm debris cleanup and disposal. LDEQ's principal role in the Corps' debris mission has been to identify suitable sites for handling and disposal of storm debris and to provide technical assistance with debris management issues. Surveillance and enforcement activities related to storm debris management fall under LDEQ's statutory responsibilities. In addition, the LDEQ is playing a major role in the removal and disposition of 350,000 flooded and abandoned vehicles and more than 60,000 abandoned vessels.

The LDEQ also provided assistance in other assigned areas such as ESF-11, Agriculture, in the disposal of animal carcasses, and ESF13, Public Safety and Security, by providing security for its own first responders during search and rescue activities. The LDEQ also incorporated the management and disposal of unwanted ammunition, firearms, and explosives as part of the ESF-10 debris mission; these were not handled by law enforcement.

G. Environmental Sampling and Reporting of Results

It is important to recognize that the basic premise of both the National Response Plan and the National Incident Management System is that incidents are generally handled at the lowest jurisdictional level possible. However, when both local and state resources and capabilities are overwhelmed, states may request federal assistance. Given the circumstances following Hurricanes Katrina and Rita, LDEQ requested assistance from the EPA to help with several tasks related to management and disposition of hazardous materials and with environmental sampling and assessment.

1. Soil/sediment

Beginning in September 2005, LDEQ and the EPA along with other federal and state partners conducted a comprehensive investigation to characterize any potential environmental effects to the parishes that were flooded by up to 10 feet of water from Lake Pontchartrain and the Mississippi River Gulf Outlet (MRGO). Since early September 2005, the agencies have collected approximately 2000 sediment and soil samples in Jefferson, Orleans, Plaquemines, and St. Bernard Parishes in four discrete phases. Most of these samples were analyzed for over 200 metals and organic chemicals.

As each phase of sampling was completed, the results were compared to conservative health-based screening levels for residential exposure developed by EPA and LDEQ. Summaries and general assessments of the data were developed by EPA and LDEQ with input from the Centers for Disease Control.

(CDC), the Agency for Toxic Substances and Disease Registry (ATSDR), the Louisiana Department of Health and Hospitals (LDHH), and FEMA.

The sample results indicate that the sediments left behind by the flooding from the hurricanes are not expected to cause any adverse health impacts to individuals, including children. A few localized areas were re-assessed due to elevated levels of arsenic, lead, benzo(a)pyrene, and diesel oil range organic petroleum chemicals. The results of these re-assessments indicated that: 1) the highest concentrations of arsenic were likely associated with herbicides used at or near golf courses; 2) benzo(a)pyrene was found in a 1 acre section of the Agriculture Street Landfill Superfund site and will be addressed as the Housing Authority of New Orleans finalizes plans for badly damaged town homes in the area: 3) diesel and oil range organic chemicals are diminishing over time and are now below residential levels; and 4) the elevated levels of lead detected in samples collected by EPA are not the

result of the hurricane. The lead results by EPA are comparable to the historical concentrations of lead in New Orleans soil found in studies conducted by local university researchers before the hurricanes.

2. Surface water

LDEQ worked with EPA, the United States Geological Survey (USGS), the Louisiana Department of Agriculture and Forestry (LDAF), and the Lake Pontchartrain Basin Foundation to monitor the quality of flood and surface waters in the Hurricane Katrina impact area. From September 2005 through March 2006, a total of 62,989 quality control and sample results have been produced, recorded and evaluated to date for Hurricane Katrina. This represents 497 sampling events from 64 sites sampled. Results for organic compounds and metals were mostly non-detect.

Of the over 40,000 results for organic compounds analyzed, only two exceeded non-drinking water human health criteria. Of the approximately 1,984 analytical results for metals, only 3 exceeded chronic aquatic life standards. Most impacts observed were a result of the hurricane and not a result of the pump down of floodwaters into Lake Pontchartrain. The quantity of floodwaters pumped from the New Orleans area into Lake Pontchartrain was estimated to be less than 5.0 percent of the lake's volume. The analytical data clearly shows that Lake Pontchartrain water quality was largely unaffected by the pumping of floodwaters from New Orleans.

3. Biota

Along with initial concerns about the health of Lake Pontchartrain came fears regarding the quality of the seafood found there. The results of sampling of flood waters and ambient Lake Pontchartrain waters helped mitigate these fears, revealing no chemicals above levels of concern. However, with added prudence, the DEQ and the United States Food and Drug Administration (USFDA) embarked upon a 5-week effort to sample and analyze tissues from commercially and recreationally important finfish and shellfish species. The USFDA laboratories analyzed 416 tissue samples for a wide variety of chemicals. The results confirmed that the seafood in Lake Pontchartrain is healthy and edible.

The analytical data showed that no advisory against seafood consumption was warranted. As an added precaution, fish and shellfish tissue will be sampled over the next 2-5 years to confirm the absence of chemical contamination in Lake Pontchartrain seafood. In addition, the USEPA and NOAA Fisheries have conducted offshore and near shore fish and shellfish tissue sampling in the Gulf of Mexico and found no contaminants at levels of concern. This is an important issue in the recovery of Louisiana, demonstrating and supporting the safety of the seafood, and therefore the viability of the seafood industry, as the seafood industry infrastructure (fishing vessels, docks, ice houses, processors, restaurants) struggles to overcome the physical impacts of Hurricane Katrina.

4. Air

In order to evaluate air quality while pre-Katrina air monitoring stations were being re-established, LDEQ collected twenty-three grab air sample canisters in the Katrina affected area. All samples were analyzed for a total of 59 target volatile organic analytes (VOC). In addition, a Photochemical Assessment Monitoring Stations (PAMS) hydrocarbon analysis was performed to quantify total non-methane hydrocarbons and identify 56 common hydrocarbon species. The majority of the grab samples had reported VOC concentrations at or slightly above normal ambient background levels. All of the detected VOC concentrations were well below the Louisiana ambient air standards and the ATSDR Minimal Risk Levels (MRL).

EPA conducted air sampling in New Orleans and the surrounding areas following Katrina. The EPA Trace Atmospheric Gas Analyzer (TAGA) results indicated that there were elevated concentrations of benzene in the area affected by the release from Murphy Oil (Chalmette) shortly after the storm. The TAGA is a self-contained mobile laboratory capable of continuous, real-time sampling and analysis. It can detect chemicals in the low parts per billion levels of outdoor air or emissions from various environmental sources. Subsequent air sampling in this region indicates that benzene concentrations have decreased and are now below screening levels. Sampling in other areas indicated that the chemical concentrations present in the air were below ATSDR screening levels. EPA also collected several sets/rounds of total particulate samples in Orleans and St. Bernard Parishes. This data indicates that the particulate concentrations were well below the level of health concern for Particulate Matter (PM_{10}).

In November 2005, DEQ prepared a report on air toxics based upon data collected from the established Kenner air monitoring site. A total of 47 samples were collected and analyzed on the 24-hour sampler between September 11, 2005 and November 13, 2005. The most abundant compounds found in these samples were pro-

pane, ethane, acetone, isopentane, toluene and n-butane. All of these compounds were detected within the normal concentration range for an urban area. The general profile of compounds detected was very typical of an area dominated by mobile source emissions. The total hydrocarbon reading averaged 147 ppbC which is slightly below the normal range for an urban area. None of the average concentrations for any of the targeted VOCs were above the annual average Louisiana Ambient Air Standards, nor were any of the individual sample concentrations above the 8 hour ambient air standards.

H. LDEQ Emergency Orders

On Sunday, August 28, 2005, LDEQ Secretary Mike D. McDaniel, Ph.D., convened a special meeting of his staff to discuss preparations for the hurricane. One of the outcomes of that meeting was a Declaration of Emergency and Administrative Order (emergency order), which the Secretary signed on August 30, 2005 to address the emergency conditions and measures deemed necessary in the wake of Hurricane Katrina to prevent irreparable damage to the environment and serious threat to life or safety throughout the designated emergency areas. Considering post-landfall conditions, a nearly identical emergency order was issued on September 27, 2005 in response to Hurricane Rita.

These emergency orders have been revised and reissued every sixty days based on additional information and changing conditions; they are still in effect in the most severely affected areas. Each order contained certain measures specifically authorized by the LDEQ and determined necessary to respond to the emergency. Exhibits 1 and 2 contain the latest two versions of the Hurricane Katrina emergency order; the Hurricane Rita orders are very similar.[1]

The LDEQ has a duty under the Louisiana Constitution to strike an appropriate balance between protection of the environment and economic, social, and other factors, consistent with the health, safety, and welfare of the people. The emergency orders have been an important part of LDEQ's fulfillment of that duty in the aftermath of Hurricanes Katrina and Rita. LDEQ's goal and expectation has been that the emergency orders would provide the information and regulatory flexibility to allow debris management and other recovery-related activities to occur as quickly as possible and in an environmentally sound manner.

1. Purpose of emergency orders

The emergency orders serve the dual purposes of:

- providing regulatory flexibility essential to the hurricane recovery efforts, as allowed under the Louisiana Environmental Quality Act (see, e.g., La. R. S. 30:2033), and
- providing useful information to the public about Louisiana's environmental laws and regulations.

2. Regulatory flexibility

The regulatory flexibility provided by the emergency orders consisted primarily of the temporary relaxation of procedural requirements for activities in the defined Emergency Areas, in order to expedite the restoration of important services and the removal of the enormous volume of hurricane debris. The emergency orders did not allow any activity that would endanger human health or the environment, and the orders had very little effect on substantive requirements, such as the limitations on effluent discharges to waters of the state. The orders generally required such standards as would a permit but did not require the time associated with the administrative process of obtaining a permit.

It was immediately necessary to provide regulatory flexibility to allow water discharges for necessary services and activities, such as potable water treatment, sanitary discharges where systems had been damaged, temporary housing locations, and temporary gasoline dispensing locations. The affected public needed safe drinking water, functioning sanitary facilities, and adequate shelter. Fuel was needed for first responders in the first days and weeks; fuel was also needed by the public, e.g., to operate generators on a continuing basis during widespread power outages. Regulatory flexibility was provided by managing such discharges in a manner protective of human health and the environment, as follows:

- Allowing the discharge of wastewaters associated with potable water treatment systems in the emergency areas, without a permit, and without first submitting a notice of intent to LDEQ. All such discharges were required to comply with the substantive limitations on effluent pollutant parameters set forth in the permit that is

[1]All orders addressing Hurricanes Katrina and Rita are available on the LDEQ website at http://www.deq.louisiana.gov/portal/Default.aspx?tabid=2570.

normally required for such discharges and the operator was required to monitor and report analytical information in compliance with the regulations. The authority granted by this provision enabled the timely operation of portable drinking water treatment facilities in areas with no other source of safe drinking water.

• Allowing the discharge of gray water (domestic wastewater from all sources except toilets) within the emergency areas, without a permit. All such discharges were required to comply with the substantive limitations on effluent pollutant parameters set forth in the permit that is normally required for such discharges and the operator was required to monitor and report analytical information in compliance with the regulations. This provision facilitated the location of temporary housing for displaced hurricane victims.

• Allowing the discharge of storm water runoff by the Corps from construction activities related to response activities in the emergency areas. This allowed the Corps to take immediate action wherever needed, such as repairs to the levee system.

The LDEQ made these water discharges possible through issuance of emergency orders. The emergency orders provided standards and limitations, including effluent standards required by the Clean Water Act Amendments. The Secretary determined that there was greater potential for harm to the public health, safety, and welfare and to the environment from the delay of discharge of the wastewaters addressed in the orders until a permit could be issued. The orders represented the most prudent way of addressing immediate environmental problems created by the hurricanes while still providing protection for human health and the environment. Protective substantive limits and reporting requirements were imposed; only administrative processes associated with permits were curtailed by the orders.

It was also necessary to provide regulatory flexibility to manage the vast amounts of debris generated by the hurricanes in an efficient and environmentally sound manner. The emergency orders provided this flexibility in the following terms with regard to solid waste disposal facilities (landfills):

• Allowing landfills to handle a greater volume of waste per day than current permits allowed. Permit limits on volume are based on normal conditions; they do not anticipate, and are not appropriate for, addressing debris management needs of the worst natural disaster in the nation's history.

• Expanding the scope of the Louisiana definition of C&D debris to include items not provided for in the LDEQ's solid waste regulations.

See Exhibit 3, LAC 33:VII.115. Appendix D of the Emergency Declarations and Orders listed material to be considered as C&D debris:

1. Nonhazardous waste generally considered not water-soluble, including but not limited to metal, concrete, brick, asphalt, roofing materials, sheet rock, plaster, lumber from a construction or demolition project, and other building or structural materials;

2. Furniture, carpet, and painted or stained lumber contained in the demolished buildings;

3. The incidental commingling of construction and demolition debris with non-friable asbestos-contaminated waste. (i.e., incidental non-friable asbestos-contaminated debris that cannot be extracted from the demolition debris); and

4. Yard waste and other vegetative matter.

Under ordinary circumstances, LDEQ regulations (unlike federal requirements) prohibit the disposal of the previously listed items in landfills that are permitted only for C&D debris. The rationale for the LDEQ regulations' prohibition is that furniture, carpet, yard waste, etc., under ordinary circumstances, are frequently mixed with household garbage containing putrescible waste, for which C&D landfills are not designed. In the aftermath of the hurricanes, in contrast, the wastes listed above are usually mixed with non-putrescible C&D debris, and segregation of the waste types is simply not practical. A determination was made by LDEQ, in consultation with EPA, that these items could be disposed of in a C&D landfill with no threat to the environment or human health. As noted above, flexibility extended to the difference between state and federal regulations. No federal regulation or standard was violated by granting this flexibility.

In addition, the emergency orders provided for other debris management processes, by existing C&D facilities as well as new, temporary debris staging and disposal sites:

• Allowing site-specific authorization by LDEQ for disposal in an "enhanced" C&D debris landfill of construction and demolition debris generated from residential structures of four units or less that are subject to a government-ordered demolition, and that are assumed to contain potential asbestos-containing waste material. In order to accept such wastes, a C&D landfill must comply with special requirements

set forth in the emergency orders that ensure the protection of workers and the public from asbestos emissions, such as perimeter air monitoring, disposal of asbestos-containing material in dedicated areas separate from non-asbestos containing C&D waste, prohibition of visible emissions, daily cover and warning signs. Enhanced C&D landfill requirements meet or exceed federal requirements for disposal of asbestos waste.

• Allowing the discharging of wastewaters from C&D landfills without a permit, provided that the discharges meet certain limitations on effluent pollutant parameters, and provided that the operator monitors and reports analytical information in compliance with the regulations.

• Allowing management of uncontaminated debris at unpermitted temporary staging areas.

• Allowing site-specific authorizations for temporary storage, chipping, grinding, and burning of hurricane-generated vegetative debris at staging areas.

• Allowing local governments to burn hurricane generated vegetative debris such as trees, leaves, vines, twigs, branches, grass, without prior notice to LDEQ.

• Allowing the commencement of emergency demolition or emergency cleanup of asbestos-containing material resulting from the hurricanes, without prior notification to LDEQ.

Although the emergency orders expanded the scope of C&D debris for hurricane generated debris, the material otherwise included is not considered to be a threat to the environment and is consistent with minimum federal requirements. In addition, it is not feasible during emergency conditions to follow normal administrative permitting processes that usually take in excess of 6 months.

The emergency orders also allowed repairs to permitted solid waste management facilities, as necessary to restore essential services and the functionality of storm water management and leachate collection systems damaged by the hurricane, without prior notice to LDEQ. This provision was necessary to ensure that there was as little impact as possible to the environment from existing facilities that may have been damaged by the storms.

The orders also provided flexibility and information for other regulated facilities, such as those with underground storage tanks. Requirements for release detection, corrosion protection, and inventory control applicable to owners and operators of underground storage tanks were temporarily suspended, during the time that the tank system was not accessible due to conditions resulting from the hurricanes. However, the emergency orders also required an emergency evaluation of the tank system before returning it to service, according to the protocol set forth in the emergency orders.

2. Public information

The public information function of the emergency orders included, among other things:

• Guidance to assist operators of sanitary wastewater treatment systems in start up and operation.

• Guidelines for temporary housing sites, including requirements relating to sanitary wastewater treatment and discharge, storm water discharges associated with construction, household waste collection and recycling, and site closure.

• Guidance for compliance with the Louisiana Emission Standards for Hazardous Air Pollutants, as they relate to asbestos, during demolition and renovation activities.

Since the issuance of the first emergency order after Hurricane Katrina, LDEQ has continued to revise the emergency orders in response to new information and changing conditions For example, LDEQ has recently eliminated several parishes from the Emergency Areas to which each emergency order applies. These changes are in response to the recovery progress that has been made in many areas.

III. HURRICANE DEBRIS MISSION

A. Overview of Debris Mission

The hurricanes left more than 62 million cubic yards of debris, millions of orphan drums and containers of unknown origin and content; over 350,000 flooded and abandoned cars; over 60,000 flooded, damaged, and/or abandoned vessels; over one million units of white goods; over 956,000 units of electronic goods; and 140,000 to 160,000 flooded homes.

The removal and proper management of debris after these two hurricanes was and continues to be a critical element of the recovery efforts. Without debris removal, there can be little rebuilding and repopulating. All types of debris, household contents, houses, cars, vessels, trees, white goods, electronics and more must be re-

moved and properly disposed of in order for citizens to return to their homes and businesses. Although more than 12,000 storm damaged houses have been demolished, it is estimated that about 30,000 additional homes remain to be demolished and disposed.

As of January 19, 2007, the Corps had removed 26,428,074 cubic yards of debris under a FEMA-funded mission assignment. This includes debris from demolition activities.

As of February 14, 2007, more than 51 million cubic yards of debris has been removed. Of this amount, 22.4 million pounds of hazardous and industrial waste were recovered and properly disposed. In addition, more than one million units of white goods and more than 956,000 units of electronic goods have been recovered and recycled.

Other information provided in chart form below summarizes the debris mission progress to date and the work still to be accomplished. This chart includes all debris removed pursuant to any FEMA-funded mission, not just the debris removed by the Corps.

Hurricanes Katrina and Rita Recovery: Debris Removal Status
(Data from FEMA as of January 22, 2007)

Parish	Estimated (CY)	Removed (CY)	Remaining (CY)
Calcasieu	5,027,729	5,021,529	6,200
Cameron	1,492,757	1,425,075	67,682
Iberia	164,286	164,286	0
Jefferson	5,493,661	5,262,586	231,075
Lafourche	279,595	279,595	0
Orleans	18,583,493	12,692,514	5,890,979
Plaquemines	2,554,853	2,462,688	92,165
St. Bernard	8,447,103	4,376,981	4,070,122
St. Charles	275,465	275,465	0
St. Mary	57,888	57,888	0
St. Tammany	10,197,224	9,633,379	563,845
Tangipahoa	741,991	741,991	0
Terrebonne	168,193	168,193	0
Vermillion	738,843	481,938	256,905
Washington	2,647,647	2,647,647	0
Total	62,242,854	51,063,881	11,178,973
		82.04%	17.96%

Hurricanes Katrina and Rita Recovery: Demolition Status
(Data from FEMA as of February 2, 2007)

Parish	Demolitions Completed	To Be Demolished
Calcasieu	321	12
Cameron	484	10
Iberia	71	6
Jefferson	681	284
Lafourche	9	0
Orleans	2,664	12,336
Plaquemines	2,133	99
St. Bernard	4,232	11,418
St. Mary	54	0
St. Tammany	1,457	923
Terrebonne	10	0
Vermillion	204	0
Washington	64	0
Total	12,384	25,088

B. Debris Mission Task Force

Following landfall of Hurricane Katrina, the LDEQ joined forces with other federal, state, and local agencies for the purpose of orchestrating and implementing a plan for the management of the then estimated more than 55 million cubic yards of debris. Designated as "Debris Operations", these agencies met daily, sometimes meeting two or three times a day as sub-committees, to address planning needs, actual and potential legal issues, agency authority and resources, and to organize which agencies would be responsible for particular tasks in the overall mission. For example, one of the subcommittees was charged with the development of a checklist and/or flow diagram to be used as a tool by state and local government entities to assist them in making a decision on the condemnation and demolition of public and private buildings and residences.

It was clear that the debris mission's scope would require the expertise and resources of all agencies to handle the amount of hurricane debris in an efficient and environmentally sound manner. The following agencies worked in collaboration to identify the debris management mission; develop the process to authorize debris management sites; and provide guidance to local government, clean up contractors, and the public:

- City of New Orleans
- St. Bernard Parish
- GOHSEP
- LDEQ
- Louisiana Department of Transportation and Development
- LDAF
- Louisiana Department of Wildlife and Fisheries
- CDC
- EPA and its contractor START
- United States Federal Emergency Management Agency (Congressional, Debris, Office of General Counsel, Safety, Infrastructure)
- Corps and its contractors: Phillips and Jordan, ECC, and CERES Environmental
- United States Coast Guard
- United States Department of Agriculture
- National Disaster Medical Service/ Disaster Mortuary
- United States Natural Resources Conservation Service (USDA-NRCS)
- United States Department of Homeland Security, Office of Inspector General, Office of Audits

C. Debris Management Plan

The intent of the debris management plan, to be developed by the debris mission task force, was:

> [T]o formalize a process that will enable the State of Louisiana, [the Corps], and [FEMA] to comprehensively manage funding for large scale and complex debris clearances. The plan was also to address the responsibilities of the various Federal, State and local governmental agencies to control the removal and disposal project for the designated parishes.

The purpose of the plan was to furnish local governments with basic information on hurricane debris management within the scope of effective environmental management. Local governments were understandably unable to use normal non-emergency resources and processes to manage the unprecedented amount of hurricane debris. The plan was also designed to ensure that debris management projects met requirements of the Stafford Act, its regulations, and all applicable environmental laws; assist the state and parishes with contracting and contract monitoring as necessary; and to the extent possible, avoid eligibility, contractual, and environmental problems.

The group recognized that the plan should be considered a starting point, with recommendations for a regional disaster debris management plan requiring the approval of all Government agencies before the final plan could be implemented.

1. Process for approval of debris management sites

Based on its jurisdiction over solid waste regulation, the LDEQ was tasked with developing a process to identify and approve hurricane debris management sites. It did this in consultation with its debris mission partners, particularly the Corps and EPA. As early as September 28, 2005, the LDEQ had prepared a Debris Management Plan, which was subsequently revised. See Exhibit 5. The plan was provided to the task force members for review, and finalized by LDEQ in consultation with these same debris mission partners.

While the LDEQ's jurisdiction over solid waste extends to determining need (capacity) and suitability of facilities, it does not include the authority to direct waste to be disposed in any particular facility. In addition, it is LDEQ's policy that no staff member shall direct or refer business to any individual or entity.

Based on the plan, local government and LDEQ were responsible for identifying and approving appropriate staging, processing and disposal sites for hurricane generated debris. All sites used for staging or disposal of hurricane generated debris that did not already possess a valid LDEQ permit were initiated by receipt of a request from a parish or other local government authority; the request included identification of potential sites and the type of activity to be performed at each location. See Exhibit 6, the initial request form. The LDEQ evaluated several different types of potential sites: debris management sites for staging of different types of hurricane generated debris; chipping, burning, and grinding of wood waste; and disposal of C&D. Following this process, approximately 400 sites were approved for this purpose.

Site evaluation began with a visit to the site by an LDEQ representative, and a representative of one or more of its debris mission partners, the Corps, and/or FEMA. Each site was assessed based on the criteria sheet provided by FEMA. See Exhibit 7, Emergency Debris Management Site Certification Form. The criteria was discussed and adapted as needed to fit the variations presented by each site and local needs.

For C&D/wood waste disposal, the LDEQ supplemented these criteria by requiring individualized site suitability analyses by an LDEQ engineer or geologist using visual observations, test pits, soil borings, or any other available methods/information. Soils with low permeability and groundwater classification were the key criteria for site approval. In the event that soils did not meet geological requirements, the location was either denied or additional requirements, such as installation of a clay liner, were imposed. This site analysis process was designed to be as close to that of the actual analysis required for C&D disposal sites without the delay associated with strict compliance with the procedural and/or administrative regulations to obtain a permit.

All sites were and are required to be operated in accordance with a written operational plan approved by LDEQ. Furthermore, all sites are required to be closed in accordance with the technical requirements of the pertinent regulations.

With the exception of the slow pace of demolition of flood damaged structures, the clean up and disposition of hurricane debris has gone reasonably well. The debris cleanup and disposal in the Rita impacted portions of the state are essentially complete. Accordingly, the C&D disposal sites authorized by the Emergency Declarations and Orders in this area will shortly cease accepting waste and begin closure procedures. According to FEMA, as of February 9, 2007, cleanup and disposal in the Katrina impacted area is 75 percent complete, with the remaining debris associated primarily with the demolition and disposal of flood damaged structures. It is esti-

mated that about 30,000 structures in both St. Bernard and Orleans Parishes will have to be demolished and disposed of. The pace of the demolitions is tied primarily to authorizations provided by local governments. FEMA also estimates that the Hurricane Rita debris mission is 96.4 percent complete.

LDEQ Authorizations for the Gentilly and Chef Menteur Landfills

The emergency orders applied to all permitted solid waste disposal facilities (landfills), including the Gentilly solid waste disposal facility, which, at the time of Hurricane Katrina, had already received its LDEQ permit. In addition, the emergency orders were used to authorize operation of unpermitted C&D landfills; Chef Menteur was a prime candidate for such authorization due to a number of factors, which are set forth in more detail below.

1. Gentilly Landfill

The City of New Orleans submitted a permit application to LDEQ in June 2002 to construct and operate the Gentilly Landfill for the disposal of C&D debris and wood waste. On December 28, 2004, a permit to construct and operate the Gentilly Landfill was issued by LDEQ. Thus, at the time of Hurricane Katrina, the Gentilly Landfill was permitted and was in the process of completing required tasks necessary under the terms of the permit before it could receive its order to commence operations.

The 2004 permit for the Gentilly Landfill authorized the construction of a landfill over a previously closed municipal landfill. This "piggyback" concept has been used before in Louisiana and other parts of the country. The goal of this technique is to fully maximize the utilization of an area that has already been utilized for disposal of waste, thus preserving green space. Using the "piggyback" concept, the existing cover system over the closed landfill acts as a liner system for the new landfill on top.

The Louisiana Solid Waste Regulations require C&D landfills to be constructed over an area with low permeability of soils. The existing cover system of the closed municipal landfill at Gentilly Landfill meets this requirement.

In accordance with the LDEQ regulations, a public notice of the draft permit was published inviting public comment. The LDEQ did not receive any public comment during the public comment period that placement of waste on top of the closed landfill would cause any adverse environmental impact. The LDEQ issued the final permit on December 28, 2004.

Before the facility had completed minor permit requirements (e.g., the installation of a fence around the facility) necessary to receive an order authorizing commencement of operation pursuant to LAC 33:VII.509.C.(4), Hurricane Katrina struck Louisiana. On September 29, 2005, after Hurricane Rita had swept through the state, adding its devastation to that of Katrina, the LDEQ issued an order authorizing commencement of operations at the Gentilly Landfill Exhibit 10. In the aftermath of the destruction of these two storms, the LDEQ had determined that the facility was sufficiently complete to commence operation and was a necessary component of the recovery efforts for the New Orleans metropolitan area.

A later decisional document, Exhibit 15, issued by LDEQ on January 20, 2006, sets out the factors weighed in the decision to utilize the Gentilly Landfill site to receive hurricane generated C&D debris.

a. Need and suitability determination of Gentilly Landfill to receive hurricane C&D debris

The decision to use Gentilly Landfill to receive hurricane generated C&D debris was based on the need for the facility and its suitability to receive such debris. The LDEQ determined that massive amounts of debris had been generated by the two storms. The LDEQ also anticipated that the damage caused by flooding would result in generation of additional demolition debris. The Corps' initial estimates were that 55 million cubic yards of debris had been generated by the storms in southeast Louisiana. At that time, an estimated 140,000-160,000 homes in southeast Louisiana received flood damage.

Following receipt of a request from local government to use Gentilly Landfill to receive hurricane C&D debris, the LDEQ issued an order authorizing commencement of operation for the Gentilly Landfill on September 29, 2005. Following issuance of this order, public concerns over the use of the facility were raised. In response to these public concerns, LDEQ required groundwater and soil samples to be collected. These samples, as well as data from the city's groundwater monitoring plan, showed no adverse environmental impact from the old landfill.

After evaluating these concerns, the LDEQ issued its decisional document, Exhibit 15, that responded to these concerns and therein authorized the continued operation of the facility and revoked the Order Authorizing Commencement of Operation

issued September 29, 2005. The decisional document provided the reasoning and rationale for the decision to continue to authorize the Gentilly Landfill. Specifically, in its decisional document, the LDEQ noted that previously, during the initial review of the LDEQ permit application, several borings were drilled through the waste in the underlying landfill to determine the suitability of constructing a C&D landfill above the old municipal landfill. The data, once analyzed, indicated that waste had undergone biodegradation, likely attributable to the partial closure and aerobic conditions in the old municipal landfill. The decisional document also reflects that as part of the collaborative site assessment process, on November 11, 2005, EPA conducted a separate assessment and found no concerns regarding groundwater or any other contamination concerns.

Two other locations were considered as alternatives prior to authorizing the use of Gentilly Landfill: Recovery 1 and Amid. The decisional document sets forth that Recovery 1 was rejected due to concerns related to its existing height, landfill stability, and imposition of additional loads. The available area was smaller than 20 acres and consequently would not provide sufficient air space for the large capacity of debris to be disposed. It was further determined that Amid, an existing C&D landfill, had only three months of air space remaining, and was therefore also inadequate for the debris generated in the area.

The LDEQ noted that the Gentilly site met all of the technical requirements for a Type III C&D Landfill, as demonstrated by the issuance of the permit in December 2004. In addition, the Gentilly site is in close proximity to the hurricane devastated areas and therefore to the bulk of the hurricane generated debris. Further, the Gentilly Landfill site is located in a remote location, and except for some industrial development, is relatively undeveloped. See Figure 1 below. Due to the remoteness of the location, waste haulers can readily access roads to the landfill. For all these reasons, the Gentilly site was the preferred alternative.

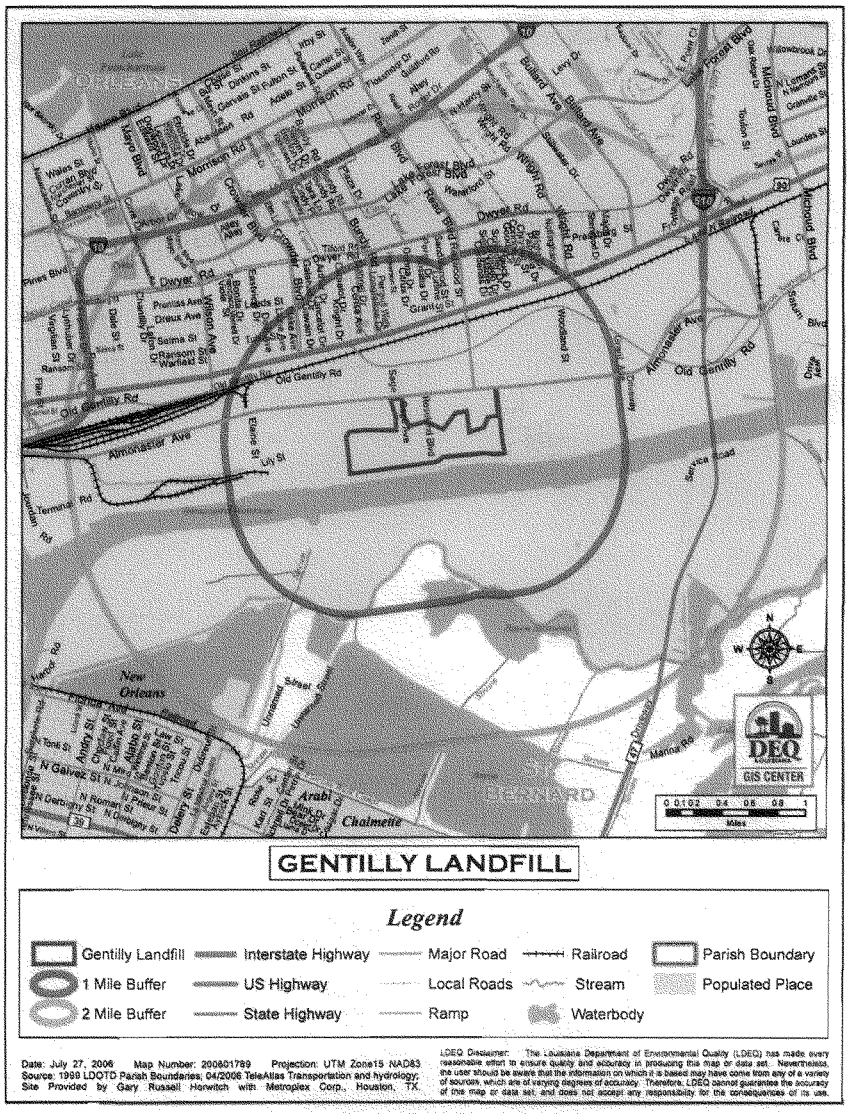

GENTILLY LANDFILL
Legend
Gentilly Landfill
1 Mile Buffer
2 Mile Buffer
Interstate Highway
US Highway
State Highway
Major Road
Local Roads
Ramp
Railroad
Stream
Waterbody
Parish Boundary
Populated Place
New Orleans
Arabi
Chalmette
St. Bernard
DEQ
GIS CENTER
Miles
Date: July 27, 2006 Map Number: 200601789 Projection: UTM Zone15 NAD83
Source: 1999 LDOTD Parish Boundaries; 04/2006 TeleAtlas Transportation and hydrology;
Site Provided by Gary Russell Horwitch with Metroplex Corp., Houston, TX.
LDEQ Disclaimer: The Louisiana Department of Environmental Quality (LDEQ) has made every reasonable effort to ensure quality and accuracy in producing this map or data set. Nevertheless, the user should be aware that the information on which it is based may have come from any of a variety of sources, which are of varying degrees of accuracy. Therefore, LDEQ cannot guarantee the accuracy of this map or data set, and does not accept any responsibility for the consequences of its use.

Fig. 1

The decisional document details further alternatives considered by LDEQ based on concerns raised by opponents to the use of the Gentilly Landfill. Existing landfills in Jefferson Parish, specifically Riverbirch and Highway 90 Landfills were also considered by LDEQ.

Riverbirch is a Type I & II landfill used for disposal of industrial solid waste and residential or commercial solid waste. It is generally more expensive to dispose of waste at a Type I/II facility, due to the additional regulatory requirements for these landfills, including liners and leachate collection systems. These additional requirements are unnecessary for landfills receiving C&D debris, so placing C&D debris in a Type III landfill is a more efficient use of landfill capacity and resources for this relatively benign type of waste, thus reserving the Type I and II landfills' disposal capacity for industrial and municipal solid waste, respectively.

The Highway 90 Type III facility located in Jefferson Parish was then (and is currently still) accepting hurricane generated C&D debris, and was subject to the same design requirements and standards as the Gentilly Landfill. However, the LDEQ determined that Highway 90 alone could not efficiently process the unprecedented amount of hurricane C&D debris to be disposed. The LDEQ decision to authorize Gentilly Landfill's immediate use in addition to that of Highway 90 recognized that use of Highway 90 included a number of transportation and other safety considerations: increased distance, traffic congestion, longer transport time, and the ability of the facility to safely process such a large daily volume of debris. See Figure 2 below. Waste transporters reported that they could haul four or five trips per day to Gentilly as opposed to two trips per day to Jefferson Parish disposal facilities.

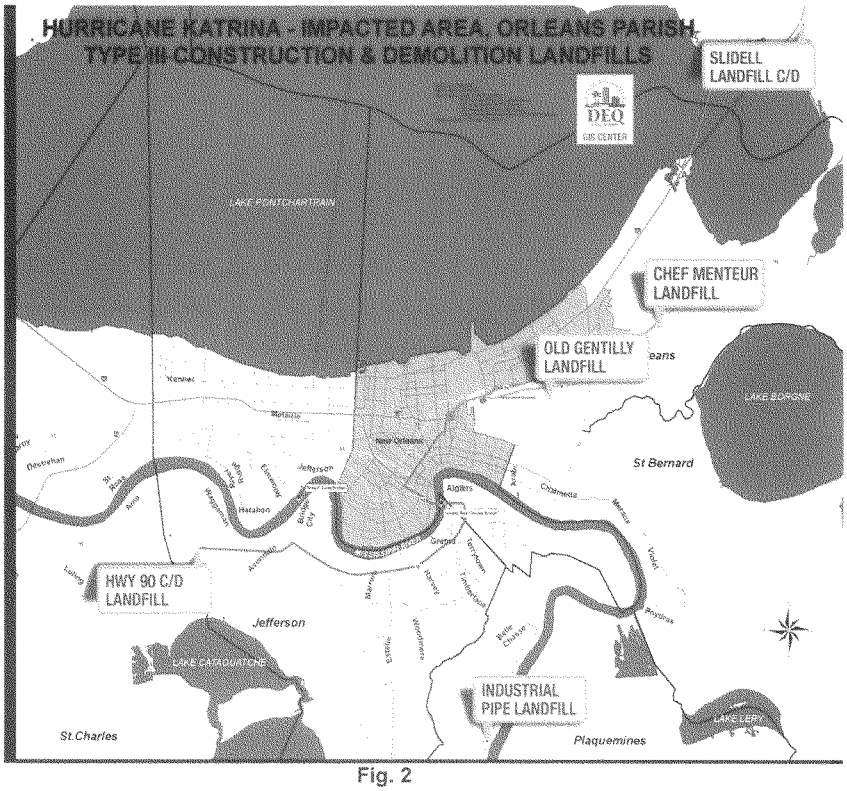

HURRICANE KATRINA - IMPACTED AREA, ORLEANS PARISH
TYPE III CONSTRUCTION & DEMOLITION LANDFILLS
SLIDELL LANDFILL C/D
DEQ
GIS CENTER
LAKE PONTCHARTRAIN
CHEF MENTEUR LANDFILL
OLD GENTILLY LANDFILL
LAKE BORGNE
St Bernard
HWY 90 C/D LANDFILL
Jefferson
LAKE CATAOUATCHE
INDUSTRIAL PIPE LANDFILL
St Charles
Plaquemines

Fig. 2

The legend and graphics in Figure 3 below show the distance in miles to Gentilly and to the facilities in the vicinity.

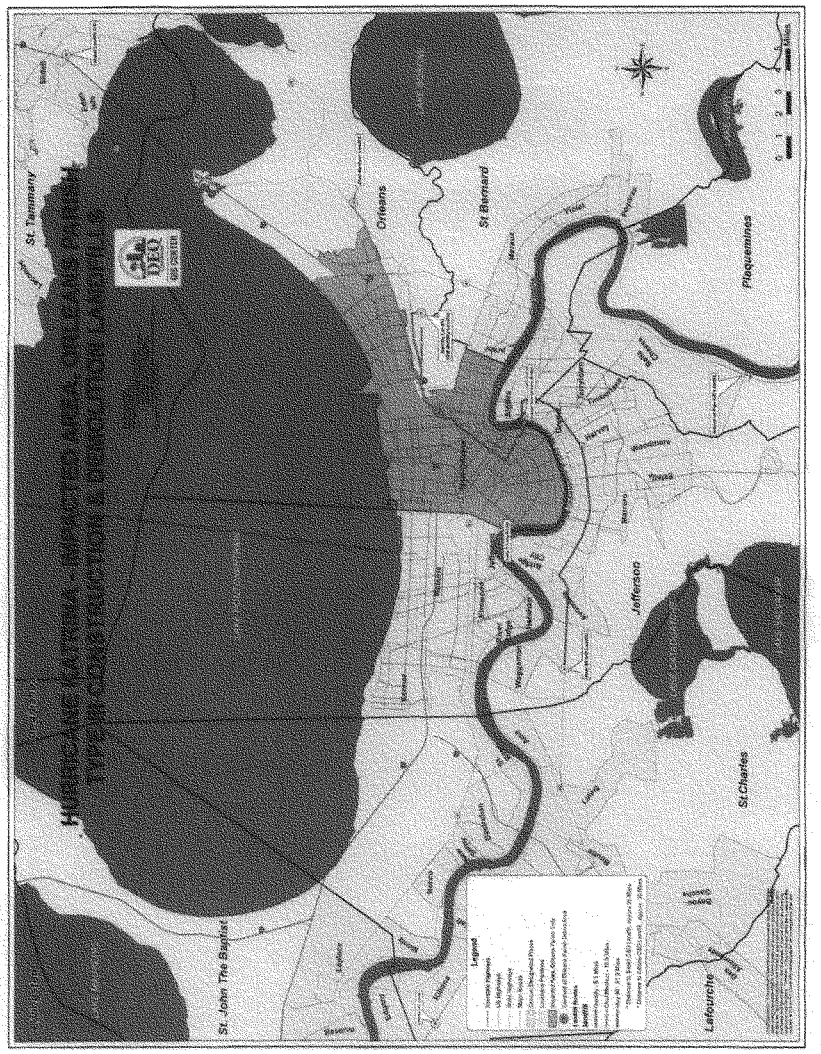


Fig. 3

In addition, as a result of the increased distance and travel time for hauling 75,000 cubic yards of C&D debris to Highway 90, as compared with the Gentilly

In addition, as a result of the increased distance and travel time for hauling 75,000 cubic yards of C&D debris to Highway 90, as compared with the Gentilly Landfill, waste haulers' truck emissions of volatile organic compounds, nitrogen oxides, carbon monoxide, particulate matter, sulfate, and ammonia would increase by nearly 300 percent, using EPA's MOBILE6 emissions model.

b. Decisional process with public input

Although the decisional document issued by the LDEQ on January 20, 2006 addressed concerns and opposition to the use of Gentilly Landfill that had been expressed at that time, the LDEQ revised and reissued the decisional document on August 28, 2006 to provide additional information and precautionary measures to address continuing public concern. Notice of the August 28th decisional document for public review and comment was provided to the public; see Exhibits 27 and 29. An LDEQ Administrative Order was issued that same date (Exhibit 28), limiting the weekly gate rate to 280,000 cubic yards and daily rate to 50,000 cubic yards, and requiring inclinometer and visual readings to confirm landfill stability, application of waste in lifts less than 25 feet, and implementation of the ground and surface water monitoring plans previously submitted.

Previously, on October 31, 2005, the Louisiana Environmental Action Network (LEAN) filed suit challenging the LDEQ order to commence which authorized the operation of Gentilly Landfill for disposal of hurricane generated C&D debris. The parties entered into a consent judgment. Issuance and public notice of the revised decisional document, along with issuance of the administrative order on August 28, 2006, met the terms of the consent judgment.

The revised decisional document noted that Gentilly Landfill had submitted a groundwater monitoring plan on July 7, 2006 (as required by the LDEQ's prior Administrative Order dated April 3, 2006, Exhibit 19). The plan, reviewed and approved by the LDEQ, provided for the placement of monitoring wells around the perimeter of the landfill to provide early warnings of potential relevant chemical changes in groundwater quality at the facility. The LDEQ further documented its analysis of the pathways of groundwater discharge to any surface water bodies, also based on public concerns.

Finally, also in response to public concern, the LDEQ contracted with a third party investigator to evaluate the slope stability of the final landfill elevation to determine what effect, if any, the landfill would have on the MRGO levee. The investigation included soil borings and analysis of the subsurface soils. The investigation concluded that the operation of the Gentilly Landfill would have no adverse affect on the MRGO levee. Notwithstanding the findings and conclusions of this investigation, the LDEQ required the installation of inclinometers to monitor any movement in subsurface soils, to provide sufficient advanced warning to avoid any remote potential that this landfill could impact the MRGO levee.

The public comment period for the revised decisional document closed on January 18, 2007, and the LDEQ is currently evaluating all public comments received to determine if additional revisions to the decisional document are necessary or advisable.

2. Chef Menteur Landfill

Prior to Hurricane Katrina, the Chef Menteur facility had undergone full LDEQ permit review for a Type III C&D disposal facility. The permit was not granted because the conditional use permit required by LDEQ regulation was denied by the New Orleans City Council on March 20, 1997.

On February 14, 2006, the Mayor of New Orleans submitted a request for the use of the Chef Menteur facility as a disposal site for hurricane generated C&D debris; see Exhibit 16. After a careful examination of scientific and/or engineering considerations, sound reasoning, and a proper evaluation of practical alternatives, including the information gathered in site assessment using the collaborative process, the LDEQ issued site authorization on April 13, 2006, Exhibit 20, and a decisional document on April 26, 2006, Exhibit 21, supporting that authorization. Notice of the decisional document's availability for review and that LDEQ would receive comments was provided to the public comment; further, the document was translated into Vietnamese because of the significant Vietnamese-speaking community in the vicinity.[2]

Chef Menteur is located at 16600 Chef Menteur Highway, New Orleans, in Orleans Parish, Louisiana, approximately 2 miles east of Interstate Highway 510 on U.S. Highway 90 (Latitude 30 02' 52″, Longitude 89 52' 55″). The site is owned by Expedition Enterprises, L.L.C., but leased to and operated by Waste Management

[2]See http://www.deq.louisiana.gov/apps/pubNotice/pdf/Chefmonteurdecisionvietnamese5-1206.pdf.

of Louisiana, L.L.C. (Waste Management), a wholly-owned subsidiary of Waste Management Holdings, L.L.C. Pursuant to the exercise of LDEQ's statutory emergency authority, the Chef Menteur site was authorized to operate as an "Enhanced" C&D Landfill[3] to receive hurricane generated C&D debris.

As set forth in the decisional document, the LDEQ determined that protection of human health and the environment, as well as public safety issues, warranted authorization of the Chef Menteur facility to receive hurricane generated C&D debris. Prior to granting emergency authorization to Chef Menteur, the LDEQ had authorized the utilization of the Gentilly Landfill for disposal of some portion of the massive amounts of hurricane generated C&D debris. However, due to public concern, the Gentilly Landfill was, at the time the Chef Menteur site request was being considered, required to operate under an LDEQ administrative order that limited Gentilly's intake of debris to 19,000 cubic yards per day. In addition FEMA unilaterally reduced the amount of debris it would provide reimbursement for to 5,000 cubic yards per day. These limitations resulted in a decrease in the volume of hurricane generated C&D debris transported and disposed in Orleans Parish. It also triggered the need for alternative C&D disposal sites.

Based upon Corps reports at the time, approximately 5,154,909 cubic yards of vegetative debris and 12,460,570 cubic yards of demolition debris in Orleans Parish remained to be processed. Additional debris not yet included in the Corps situation reports was expected due to a FEMA national flood insurance policy that required the elevation of certain structures in the New Orleans metropolitan area by as much as three feet. Many houses that could not be elevated properly were slated for demolition. In light of these Corps reports and based upon a Corps Structural Demolition Decision Analysis for the demolition of structures in Orleans Parish, the following results were predicted, unless additional receptor sites in close proximity to the anticipated demolitions were approved: 1) the estimated rate of demolition would require reassessment; 2) the execution, in approximately eight months, of the first phase of demolition (structures near collapse) would become questionable; and 3) the execution of the broader mission, which could include demolition of 20,000 or more structures, would require over 6 years.

Therefore, to expedite the removal and disposal of the remaining C&D hurricane generated and demolition debris associated with demolition activities in the area in and around Orleans Parish and particularly in the Ninth Ward Area, the LDEQ authorized the construction and operation of Chef Menteur disposal site.

As shown in Figures 2 and 3 above, Chef Menteur is in close proximity to the major sources of hurricane generated C&D debris. As Figure 4 below shows, the Chef Menteur site is approximately two (2) miles from the nearest residential neighborhood.

[3]An "Enhanced" C&D Landfill is a C&D landfill allowed to accept asbestos-containing waste material under requirements (equivalent to Louisiana Emission Standards for Hazardous Air Pollutants (LESHAP) requirements) set forth by the LDEQ Declaration of Emergency and Administrative Order; and as found consistent by EPA with NESHAP for asbestos (National Emission Standards for Hazardous Air Pollutants) in a March 1, 2006, letter to the LDEQ, Office of Environmental Compliance, Assistant Secretary, Harold Leggett, Ph.D.

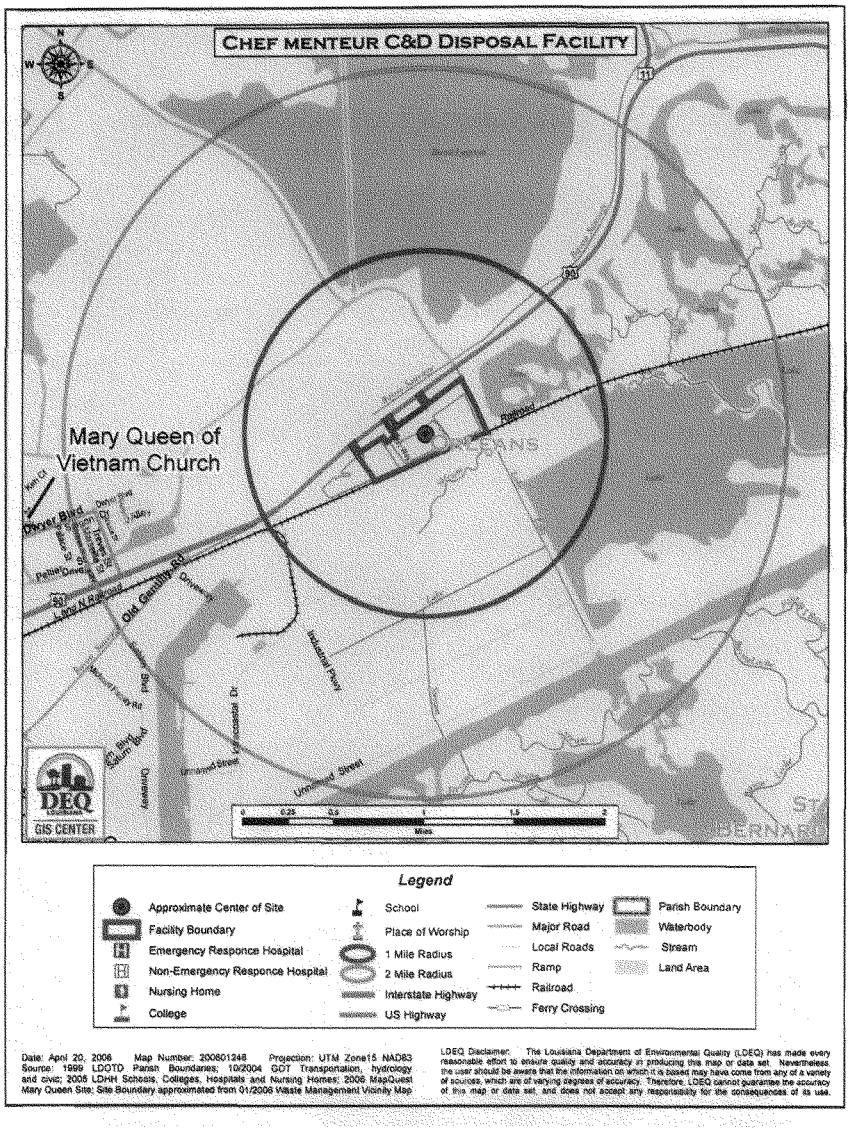
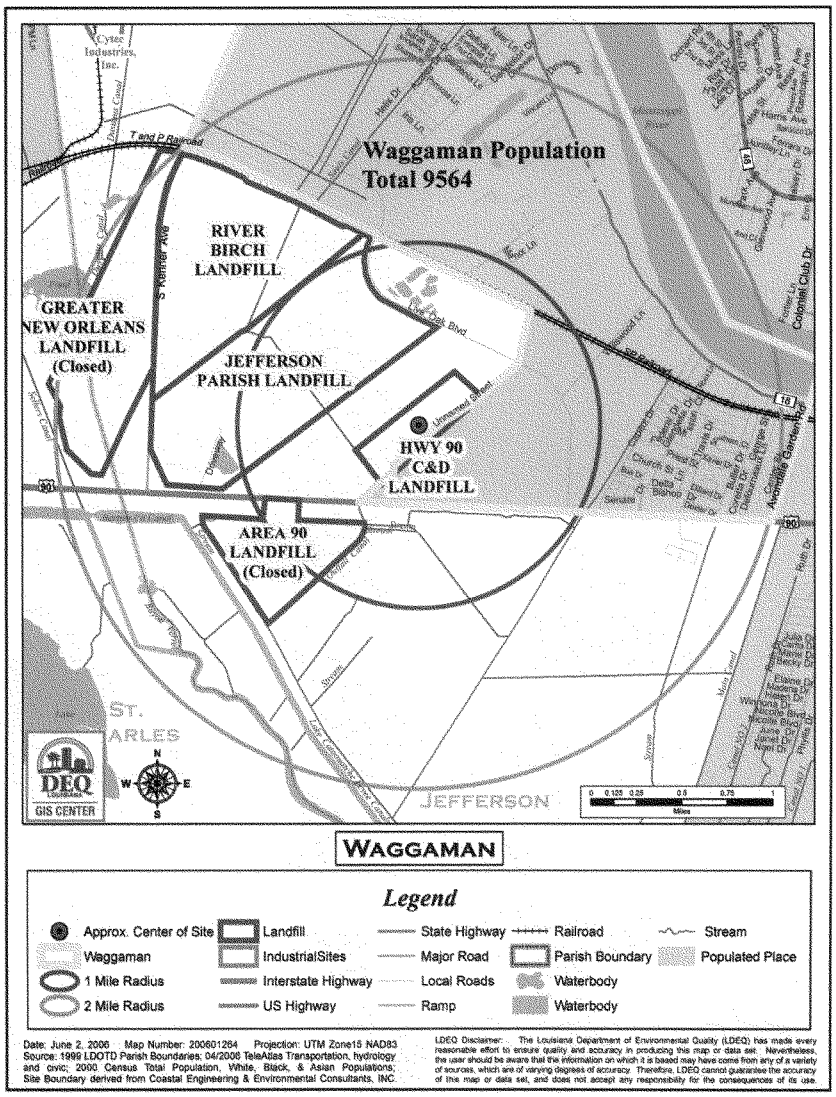

CHEF MENTEUR C&D DISPOSAL FACILITY
Mary Queen of Vietnam Church
Dwyer Blvd
Old Gentilly Rd
Paris Rd
Industrial Pkwy
Lake Forest Blvd
Chef Menteur Hwy
Lake Forest Dr
Unnamed Street
Bayou Sauvage
NEW ORLEANS
ST. BERNARD
DEQ
GIS CENTER
Miles
Legend
Approximate Center of Site
Facility Boundary
Emergency Responce Hospital
Non-Emergency Responce Hospital
Nursing Home
College
School
Place of Worship
1 Mile Radius
2 Mile Radius
Interstate Highway
US Highway
State Highway
Major Road
Local Roads
Ramp
Railroad
Ferry Crossing
Parish Boundary
Waterbody
Stream
Land Area
Date: April 20, 2006 Map Number: 200601248 Projection: UTM Zone15 NAD83
Source: 1999 LDOTD Parish Boundaries; 10/2004 GOT Transportation, hydrology and civic; 2005 LDHH Schools, Colleges, Hospitals and Nursing Homes; 2006 MapQuest Mary Queen Site; Site Boundary approximated from 01/2006 Waste Management Vicinity Map
LDEQ Disclaimer: The Louisiana Department of Environmental Quality (LDEQ) has made every reasonable effort to ensure quality and accuracy in producing this map or data set. Nevertheless, the user should be aware that the information on which it is based may have come from any of a variety of sources, which are of varying degrees of accuracy. Therefore, LDEQ cannot guarantee the accuracy of this map or data set, and does not accept any responsibility for the consequences of its use.

Fig. 4

Figure 5 shows, by way of comparison, the closer proximity of the landfills, including Highway 90 Landfill, to the community of Waggaman than that of Chef Menteur to the nearest community.



WAGGAMAN

Legend

Approx. Center of Site	Landfill	State Highway	Railroad	Stream
Waggaman	IndustrialSites	Major Road	Parish Boundary	Populated Place
1 Mile Radius	Interstate Highway	Local Roads	Waterbody	
2 Mile Radius	US Highway	Ramp	Waterbody	

Date: June 2, 2006 Map Number: 200601264 Projection: UTM Zone15 NAD83
Source: 1999 LDOTD Parish Boundaries; 04/2006 TeleAtlas Transportation, hydrology and civic; 2000 Census Total Population, White, Black, & Asian Populations; Site Boundary derived from Coastal Engineering & Environmental Consultants, INC.

LDEQ Disclaimer: The Louisiana Department of Environmental Quality (LDEQ) has made every reasonable effort to ensure quality and accuracy in producing this map or data set. Nevertheless, the user should be aware that the information on which it is based may have come from any of a variety of sources, which are of varying degrees of accuracy. Therefore, LDEQ cannot guarantee the accuracy of this map or data set, and does not accept any responsibility for the consequences of its use.

The gravity of the emergency situation created by Hurricane Katrina required regulatory flexibility and a consideration of the timeframe for debris removal. With the authorization of Chef Menteur Landfill, the LDEQ estimated the timeframe for completion of debris disposal (when combined with existing the Gentilly and Highway 90 Landfills) to be as follows:

—Remaining Vegetative Debris: 5,154,909 cubic yards
- Using Highway 90 only—10.2 months2 or 5.3 years1
- Using Gentilly and Highway 90—5 months2 or 8.8 months1
- Using all three landfills—3.4 months2 or 4.7 months1

—Remaining Demolition Debris: 12,460,570 cubic yards
- Using Highway 90 only—1.7 years2 or 11 years1
- Using Gentilly and Highway 90—10.4 months2 or 1.5 years1
- Using all three landfills—7.2 months2 or 9.6 months1

Note: 1—Assuming landfill receives actual permitted weekly volume only
2—Assuming landfill receives 133,000 cubic yards/week

Along with the City of New Orleans' request to use the Chef Menteur facility, Waste Management also submitted operational information, including for example, waste acceptance guidelines, asbestos-containing waste material management, Louisiana Emission Standards for Hazardous Air Pollutant (LESHAP) Protocol, and the requirements to operate as an "Enhanced" C&D Landfill.

The LDEQ concluded that the Chef Menteur was environmentally suitable for such a C&D site. Historically, the Chef Menteur site had undergone an extensive permitting review process by the LDEQ pursuant to a permit application submitted in 1994 by Construction Debris, Inc.[4] The LDEQ found that additional factors rendered Chef Menteur suitable for emergency C&D disposal. These factors included:

1) Zoned industrial;

2) Proximity to areas where hurricane-generated debris is found and where demolition of storm damaged structures will be occurring, thereby resulting in reduced hauling time and cost, and reduced vehicle pollution effects, as shown on Figure 2;

3) Adequate distance from neighbors as shown on Figure 3;

4) Previously reviewed by the LDEQ for placement of a C&D landfill pursuant to standard permitting procedures;

5) Evidence of suitable geology and engineering for the purposes of a C&D landfill[5] and is located within fastlands;[6]

6) Operated by a national company with experienced and properly trained employees;

7) Contains no known archeological or historical sites within 1,000 feet of the site boundaries;

8) Contains no rare, threatened or endangered species or habitats within 1,000 feet of the site boundaries;

9) Contains no state or federal parks or scenic streams within 1,000 feet of the site boundaries;

10) Easily accessible route;

11) Sufficient available acreage; and

12) Already contains existing excavations or borrow pits that will be utilized, after modification, for disposal cells (Cell 1 and Cell 2).

After carefully considering the request, and ascertaining the concurrence of local government, the LDEQ authorized the Chef Menteur site as a temporary C&D disposal facility authorized pursuant to the emergency orders. The facility was authorized to accept for disposal the following materials:

- Nonhazardous waste generally considered not water-soluble, including but not limited to metal, concrete, brick, asphalt, roofing materials (shingles, sheet rock, plaster), or lumber from a construction and demolition project;
- Furniture, carpet, or painted or stained lumber contained in the demolished buildings;
- The incidental commingling of construction and demolition debris with non-friable asbestos-contaminated waste (i.e., incidental non-friable asbestos-contaminated

---

[4]Although environmental suitable, the LDEQ never issued a permit to Construction Debris, Inc., based on its 1994 application because the Council of the City of New Orleans denied the conditional use permit for Construction Debris, Inc., which the facility was required to obtain under LAC 33:VII.519.N.

[5]See Waste Management of Louisiana, Chef Menteur Disposal,, Emergency Disaster Cleanup Site Request: Supplemental Operational Information, Vol. 1, March 1, 2006, and March 15, 2006, Section 7.

[6]A "fastland" is property located inside the hurricane protection levee system, which is outside the jurisdiction of the local coastal management program.

debris that cannot be extracted from the demolition debris, all in accordance with the requirements applicable to "Enhanced" C & D Landfills); and

- Yard Trash.

The wastes to be accepted were generated from direct and indirect effects of hurricane damage; the primary sources being Orleans, St. Bernard, and St. Tammany parishes. Available capacity of the landfill was set at approximately 7.2 million cubic yards, with the accepted waste being immediately landfilled in prepared cells. After each cell reached its design limitations, they were to be capped according to approved LDEQ procedures. White goods[7] and putrescible,[8] hazardous, liquid, infectious, industrial, commercial, and residential wastes were not allowed to be disposed at the Chef Menteur site.

Public participation in this decision was achieved through the issuance of a decisional document setting forth the LDEQ's reasons for authorizing the Chef Menteur site; see Exhibit 21. This document was public noticed in major newspapers in both New Orleans and Baton Rouge, as shown in Exhibit 22. The public notices provided a 30-day public comment period. Because of the nearby Vietnamese-American community, a Vietnamese language version of the decisional document was made available to facilitate public review and comment. Public participation in the Chef Menteur authorization differed from the normal public participation process in that it came after the decision, not before.

The LDEQ's decision to authorize the Chef Menteur site met with opposition from the Vietnamese community and others. Lawsuits were filed in state and federal courts both in Baton Rouge and New Orleans. Many of these legal challenges are pending. However, the facility is no longer operating due to a cease and desist order issued by the City. Also, as a result of this cease and desist order issued by the City, the LDEQ has advised the facility that it intends to revoke its emergency authorization to operate because of the lack of local government concurrence for the continued use of the facility. Since then the facility has advised LDEQ that it will be closing and it plans to submit a revised closure plan to accomplish same in the near future.

3. Both Gentilly and Chef Menteur landfills met all technical and substantive requirements for permitted C&D landfills

Every permit application is evaluated for technical merit and compliance with the applicable regulations. In addition, the permit process imposes public participation requirements prior to issuance of the permit. The LDEQ went through its normal process in permitting the Gentilly Landfill, including the normal public participation prior to issuance of the permit in December 2004. LDEQ simply exercised its emergency authority to allow the facility to commence operation prior to completing some incidental tasks required by the permit.

Although Chef Menteur was not a permitted facility, the LDEQ had previously completed the full review for compliance with all technical and substantive requirements, even though no permit was issued. The authorization of Chef Menteur to receive hurricane generated C&D debris followed the standard process developed by LDEQ in collaboration with its debris mission partners as part of the debris mission plan. The Chef Menteur site was required to meet all technical and substantive requirements for a permitted facility.

The only deviation from the normal permitting process for this site was that public notice and the opportunity to comment were provided after the fact rather than before the decision. Moreover, the LDEQ carefully considered the comments made and concerns raised and maintained its full authority to adjust or rescind the authorization as appropriate.

4. Hurricanes Katrina and Rita: "Cradle to grave" debris management

In addition to the thorough evaluation of proposed disposal sites, the LDEQ, in collaboration with its debris mission partners, has conducted (and continues to conduct) rigorous examination and robust oversight of the entire debris management process to minimize, to the maximum extent possible, any negative impact to human health or the environment from disposal of hurricane generated C&D debris. The primary focus of this oversight is to prevent any prohibited items from being disposed of at approved hurricane generated C&D debris disposal sites.

To address the removal and management of debris, the LDEQ prepared the Hurricane Katrina Debris Management Plan which was released on September 28, 2005, and revised on October 14, 2005, Exhibit 5. These earlier plans and lessons

[7]"White goods" are defined as "discarded domestic and commercial appliances such as refrigerators, ranges, washers, and water heaters." LAC 33:VII.115.

[8]"Putrescible waste" is defined as waste "susceptible to rapid decomposition by bacteria, fungi, or oxidation, creating noxious odors." LAC 33:VII.115.

learned have been incorporated into the LDEQ Comprehensive Plan for Disaster Cleanup and Debris Management released July 2006 and revised August 2006, Exhibit 26. An integral part of these plans is the segregation of debris so that the various types of debris can be properly managed and disposed. Segregation of debris occurs at multiple points in the debris handling process and Federal and State oversight has also been implemented at various points in the process to further insure proper disposal.

First, residents and contractors are instructed to remove household hazardous waste, white goods, and electronic goods and place them curbside prior to gutting or demolishing houses. See Exhibit 35.These items are then picked up by designated contractors and taken to specific staging areas for further processing for either disposal or recycling.

To further insure proper debris segregation and disposal, spotters are employed to observe the loading of all debris so that only the debris designated for transport is loaded. Spotters are also located at staging areas to insure that only the debris types designated for that site are staged there. At disposal sites trucks must stop at towers where observers check each load and then additional spotters check the debris as it is unloaded. If inappropriate waste is received, the entire load may be rejected or the inappropriate waste is segregated and the site is responsible for, and must document, the proper disposal of the inappropriate waste.

Finally, LDEQ and EPA constantly assess the entire debris management process to ascertain the proper handling and disposal of all storm related debris. Inspectors assess the debris stream, and the effectiveness of the spotters, as the debris is loaded and un-loaded at the source, staging areas, and disposal sites. Oversight of landfills and debris sites is conducted based on the type and volume of waste received. The major C&D landfills in the New Orleans area have had either LDEQ or EPA-START inspectors on site during all hours that the landfills are open.

The frequency of other sites' debris stream assessments varies from daily to once per two weeks, as noted above, based on type and volume of waste received. Inspections of scheduled demolition sites are coordinated with LDEQ and various entities. The chart below provides a summary of the oversight assessments of operations to date at landfills and demolition sites.

Operational Oversight/Assessments Post-Hurricane
(As of February 17, 2007)

Agency	Landfills\Debris Sites	Demolitions
LDEQ	2,071	1,379
EPA-START	919	2,031
Total	2,990	3,410

Figure 6 below provides a flow chart of the "cradle to grave" assessment and oversight of the hurricane related debris waste streams. This process is designed to prevent any prohibited items from being disposed of at any approved hurricane generated C&D debris disposal sites.

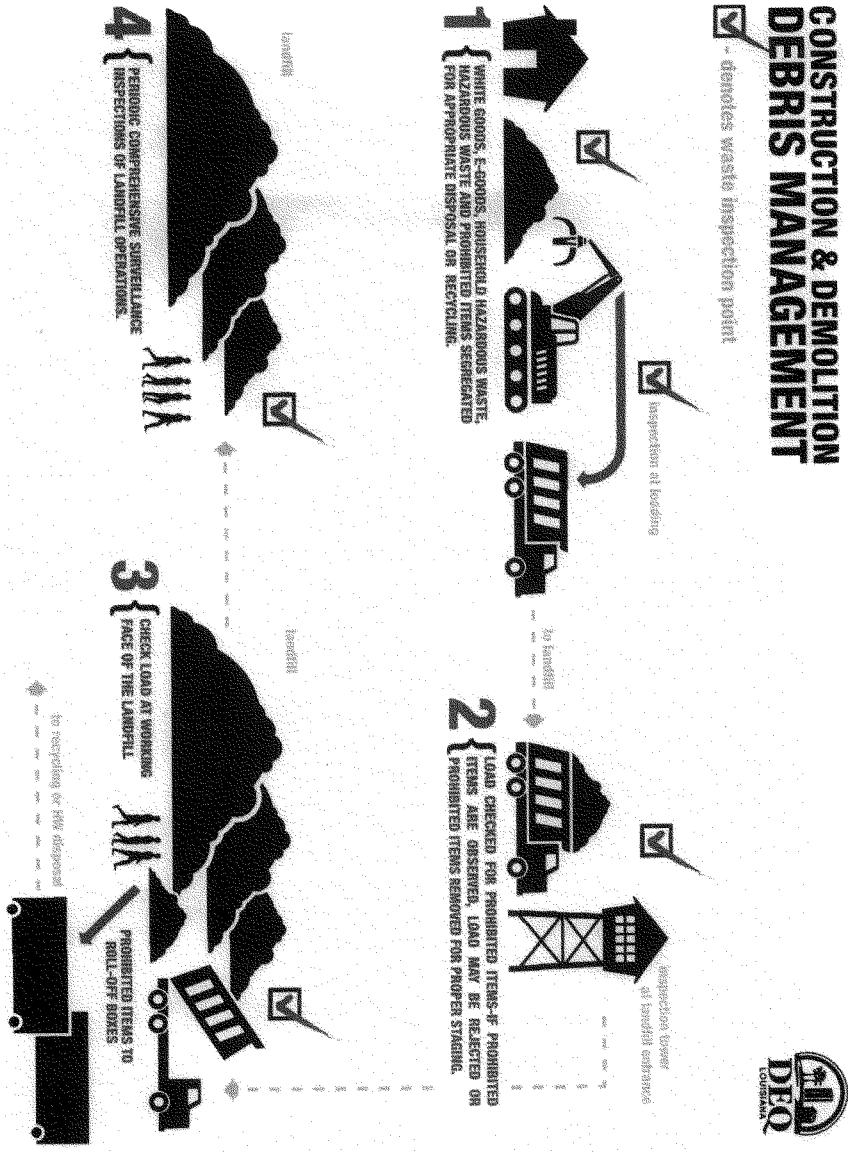

CONSTRUCTION & DEMOLITION
DEBRIS MANAGEMENT
- denotes waste inspection point
inspection at landfill entrance
inspection at loading
1
WHITE GOODS, E-GOODS, HOUSEHOLD HAZARDOUS WASTE, HAZARDOUS WASTE AND PROHIBITED ITEMS SEGREGATED FOR APPROPRIATE DISPOSAL OR RECYCLING.
to landfill
2
LOAD CHECKED FOR PROHIBITED ITEMS-IF PROHIBITED ITEMS ARE OBSERVED, LOAD MAY BE REJECTED OR PROHIBITED ITEMS REMOVED FOR PROPER STAGING.
3
CHECK LOAD AT WORKING FACE OF THE LANDFILL
PROHIBITED ITEMS TO ROLL-OFF BOXES
landfill
landfill
4
PERIODIC COMPREHENSIVE SURVEILLANCE INSPECTIONS OF LANDFILL OPERATIONS.
to recycling or HW disposal
DEQ
LOUISIANA

Fig. 6

The best measure of the effectiveness of the "cradle to grave" management of the storm debris can be found in the amounts of hazardous and industrial waste, white goods, and electronic waste which were properly disposed of or recycled. As of February 14, 2007, more than 4.9 million containers of hazardous waste have been recovered and 22.4 million pounds of hazardous and industrial waste has been properly disposed. In addition, more than one million units of white goods and more than 956,000 units of electronic goods have been recovered and recycled.

5. Treated wood in C&D landfills

Environmental concerns have been raised concerning disposal of treated wood containing chromated copper arsenate (CCA) in C&D debris landfills. Federal and state environmental regulations define CCA treated wood materials as a non-hazardous waste. This classification is based upon the disposal of CCA treated timbers in the form of the material's intended use, wood products, and not in the crushed and ground form that is tested in determining whether a product should be classified as a hazardous waste (AWPI, 1997). Assertions that CCA treated lumber poses a threat to groundwater when disposed of in a C & D landfill are usually based upon studies that show that some CCA treated lumber exceeds the Toxicity Characteristic Leaching Procedure (TCLP) regulatory limit of 5 mg/L for arsenic. Leachate from CCA treated wood has been shown to range from 3.0 mg/L up to 7.5 mg/L (Dubey and Solo-Gabrielle 2004). TCLP regulatory levels are based upon a model that assumes wastes in an open dump will be surrounded and layered with decaying municipal trash, which will produce a harshly acidic environment, thus encouraging constituent chemicals to dissolve from the waste and migrate to groundwater. The TCLP regulatory level is the predicted leachate concentration that would be protective for a hypothetical drinking water well located 500 feet from the disposal site.

Conditions at the New Orleans C&D landfills are drastically different from the assumptions that were used in the TCLP model. There are no drinking water wells within miles of the landfill or potable aquifers anywhere in Orleans parish, for that matter. The nearest Point of Exposure (POE) at the landfill is not a nearby drinking water well, but surface water bodies located at least four times further away than the hypothetical drinking water well used in the TCLP model. Additionally, drinking water standards are not applicable or appropriate for the protection of a surface water body that is not used as a source of drinking water. A more appropriate measure of environmental protection is the Louisiana Surface Water Quality Criteria. The Surface Water Quality Criterion for arsenic is 5 times higher than the drinking water standard. This criterion for arsenic is protective of primary and secondary contact recreation, as well as fish and wildlife propagation.

Based upon these factors, leachate concentrations reported for both new and weathered CCA treated wood materials are not expected to result in any unacceptable impact to groundwater or surface water at or near south Louisiana C&D landfills. This conclusion is supported by the model used to develop the TCLP regulatory standards and confirmed by site specific evaluations using the models and protocols in Louisiana's Risk Evaluation/Corrective Action program (RECAP).

IV. WHAT WORKED WELL

A. Interagency Collaboration

Overall, the interagency collaboration following the hurricanes worked well, and allowed efficient and effective use of resources by federal, state, and local government agencies.

1. Management of waste stream

Proper management of recyclables, household hazardous waste, electronic waste, and white goods are examples of tasks where all levels of government collaborated and coordinated their activities and oversight to accomplish important goals of the debris management plan.[9] Maintaining close lines of communication between members of each subcommittee or task force contributed to the successful efforts.

2. Environmental Sampling and Reporting of Results

It is important to recognize that the basic premise of both the National Response Plan and the National Incident Management System is that incidents are generally handled at the lowest jurisdictional level possible. However, when both local and state resources and capabilities are overwhelmed, states may request federal assistance. Given the circumstances following Hurricanes Katrina and Rita, LDEQ requested assistance from the EPA to help with several tasks related to management

[9]See the first paragraph on page 37, supra, for the statistics as of February 14, 2007.

and disposition of hazardous materials and with environmental sampling and assessment.

EPA and LDEQ, along with other federal and state agencies, coordinated to gather environmental samples, analyzed these samples, interpreted the results, and communicated the results to the public. Much of the sampling done was specifically tailored to address the concerns of local governments and the public in the areas affected by the hurricanes, as follows:

• A comprehensive investigation addressed the soils and sediments of the parishes that flooded; samples were analyzed for over 200 metals and organic chemicals. The study concluded there was no cause to anticipate any adverse health impacts to individuals, including children.

• Non-scientific catch phrases such as "toxic soup" and "toxic gumbo" used to describe flood waters in the impacted area raised public concern. The LDEQ and EPA conducted extensive sampling and determined that while the waters were unsanitary, they were not toxic and presented no long term health hazard. The agencies then issued a joint press release communicating to the public the analytical results and their conclusions.

• Fears about the safety of flood waters and Lake Pontchartrain led to fears about the safety of consuming seafood. Finfish and shellfish were sampled in Lake Pontchartrain, and in offshore and near shore gulf waters to confirm that seafood was safe to eat and no advisory against seafood consumption was warranted.

• Air sampling began immediately after Katrina and continued through November 13, 2005. Elevated concentrations of benzene were detected in the area affected by the release from Murphy Oil (Chalmette) shortly after Katrina; however, subsequent sampling showed results below screening levels. Particulate sampling (Orleans and St. Bernard Parishes) and air toxics (Kenner) found concentrations well below any level that would raise health concerns.

B. Planning for Permit Actions and Displaced Residents

The emergency orders also provided special procedures for public notice and public participation regarding proposed permit actions in the emergency areas. These special procedures were designed to facilitate notice to the large number of residents displaced by the hurricanes, and included such measures as increasing the number of required newspaper advertisements, and the extension of public comment periods.

Immediately following the hurricanes, the LDEQ deferred noticing of any environmental permits in affected parishes until a reasonable plan could be devised. A comprehensive plan was developed by November 2005 to provide for extra noticing of permits in parishes affected by hurricanes. That plan distinguished between 3 categories of impact and notice requirements. Amount of notice depended on how severe the damage was estimated to be and the percent of the population displaced. To widely disseminate the plan, the LDEQ issued notices in the State Register, The Advocate, and on LDEQ's public notice web page. The LDEQ sent the plan to the members of the Environmental Justice Interagency Taskforce (EJIT) group that was spearheaded by EPA Region 6.

Public notice and comment procedures were designed to vary according to the categorization of the parish in which the facility with the permit activity was located. The LDEQ evaluated all affected parishes according to all relevant factors, including but not limited to the following, to arrive at 3 different categories:

1. newspaper circulation rates (both paid subscriptions and free distribution), comparing pre-hurricane with then-current rates
2. basic services - power, potable water, and sewage treatment
3. local government approval for residents to return for long-term habitation
4. number of open schools
5. availability of locations to serve as document repositories and in which to conduct public hearings should they be requested
6. condition of roads

Parishes were identified as Category 1 when newspaper circulation rates and basic services had been restored to at least 90 percent of pre-hurricane levels, the parish was open for long-term habitation, and public schools had resumed operation. Initially, this category included the following 27 parishes: Acadia, Allen, Ascension, Assumption, Beauregard, East Baton Rouge, East Feliciana, Evangeline, Iberia, Iberville, Jefferson Davis, Lafayette, Lafourche, Livingston, Pointe Coupee, St. Charles, St. Helena, St. James, St. John, St. Landry, St. Martin, St. Mary, Tangipahoa, Vermilion, Washington, West Baton Rouge, and West Feliciana.

In Category 1 parishes, the LDEQ continued to implement the public notice procedures in place before the hurricanes. That included publication in the required newspapers, sending notice to individuals on the LDEQ's permits mailing list, plac-

ing notice on the LDEQ web page, and sending electronic notice to individuals who have registered to receive notices in this manner. The LDEQ Public Participation Group (PPG) used its knowledge of newspaper distribution rates and patterns to determine if the notice should be placed in more than one local newspaper. Some permit procedures required notice to also be placed in the official state journal, The Advocate.

Parishes identified as Category 2 when newspaper circulation rates and basic services had been restored to at least 50 percent of pre-hurricane levels, the parish was open for long-term habitation, and public schools had resumed operation. Initially, parishes in this category were St. Tammany, Jefferson, Terrebonne, Calcasieu, and Plaquemines. In Category 2 parishes, the LDEQ followed the same procedures provided for Category 1, with the addition of the following: Notices were placed in The Advocate to identify the permits placed on public notice for the previous week, sorted by parish. These notices clearly identified the electronic web link to view the public notices and gave the phone number to call to request additional information or to find out where documents might be reviewed locally.

Category 3 parishes were the most severely affected parishes. Any parish not meeting all of the criteria for Category 2 were considered Category 3. As of this date, the parishes in this category are Cameron, Orleans, and St. Bernard. In Category 3 parishes, the LDEQ follows the same procedures as for Category 2, with the addition of the following:

1. Comment periods will be extended a total of 15 extra days.
2. Notices will be published twice in the selected newspaper(s).
3. An additional newspaper will be selected in which to publish the notices. This will be the newspaper with the largest circulation in a parish that physically adjoins the parish in which the facility is located.
4. If not already required to do so, the LDEQ will publish notices in The Advocate, the official state journal.

When arranging public hearings to solicit comments regarding permitting activities, the LDEQ will work with stakeholders to find suitable hearing site locations.

The plan was revised in October 2006, based on reevaluation of newspaper circulation, population reestablished, availability of public services, etc. The LDEQ continues to provide additional public notice procedures today. The dislocation of residents and the damage to infrastructure in the emergency areas has affected the ability of the LDEQ to solicit and receive comments on proposed permit actions. The procedures detailed above are intended to address these issues in a manner that offers the opportunity for meaningful public participation and that meets the requirements and intent of the state and federal permitting statutes and regulations.

V. WHAT DID NOT WORK WELL

Although, as noted above, federal, state, and local government agencies worked well together in the aftermath of the hurricanes to address the majority of response and recovery activities, no clear guidelines or references existed on how to provide regulatory flexibility for actions predictably necessary for an effective and efficient response to this level of disaster. Many of these actions, including the need for multi-level government collaboration, could have been anticipated. Forethought and coordination before the event could have significantly reduced the amount of resources necessary and the time frame for efficient government action.

The LDEQ had certain expectations when faced with the unprecedented events caused by the two hurricanes. It shared the expectations of its government partners that cooperation and coordination would be hallmarks of any successful response and recovery plan and its implementation. The lessons learned from Hurricanes Katrina and Rita and Louisiana's subsequent preparation for the 2006 hurricane season lead LDEQ to suggest that further steps be taken to prepare all regions of the country for the possibility of a natural or man-made disaster.

A. The time it took (6 MONTHS) to work out regulatory flexibility for various issues, such as the asbestos NESHAP

Shortly after Hurricane Katrina made landfall and the extent of the devastation became apparent, LDEQ recognized that it needed to coordinate with the EPA on potential National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements regarding asbestos. On September 7, 2005, while New Orleans and parts of St. Bernard parish were still under water, LDEQ staff made inquiries of EPA Region 6 regarding burning construction and demolition debris not susceptible or that otherwise would be inspected as required by the asbestos NESHAP regulations.

Subsequently, acting upon the advice of personnel from EPA Region 6, on September 22, 2005, LDEQ requested a No Action Assurance (NAA) from the asbestos

NESHAP for Hurricane Katrina recovery efforts. The request concerned inspection and demolition of residential structures and the potential burning of hurricane related and demolition debris that could possibly contain incidental asbestos.

In an effort to quantify the potential scope of the asbestos issue in recovery efforts, LDEQ staff, using in part US Census data for the impacted area, derived estimates of the possible number of residential structures that could reasonably be expected to contain asbestos, based in a large part to the age of the home. The results of this estimate raised the concern that there would not be enough trained asbestos inspectors available to staff near-term demolition activities.

In preparing the September 2005 NAA request, LDEQ also reviewed state and federal regulations and available EPA guidance. Available EPA guidance did not address either the extent of the devastation or the unique circumstances surrounding Hurricane Katrina's aftermath. The NAA request indicated that the inspection, segregation, and disposal steps set forth in EPA's guidance documents would take years to complete; meanwhile, the uninhabitable buildings would continue to pose significant health and safety concerns. LDEQ was also concerned that landfill capacity in the immediate area would be insufficient to handle the estimated volume of debris generated by the storms and the resultant recovery efforts.

Further complicating the debris issue, the New Orleans area has a large and destructive Formosan termite infestation. To prevent further spread of this termite, the Commissioner of the LDAF issued a quarantine on the movement of any wood or cellulose products from certain parishes unless it has been fumigated or otherwise treated for Formosan termites and the movement is approved by the Commissioner or the Commissioner gives written authorization for untreated material to be moved from the named parishes. Therefore, disposal of the construction and demolition debris in landfills outside of the affected parishes would require treatment with pesticides under the State Quarantine Order designed to prevent the spread of the Formosan termite to less-infested areas.

In its NAA request, LDEQ outlined a set of demolition and disposal practices for the New Orleans area designed to remove uninhabitable structures in an expeditious manner while minimizing public health and safety risks. By adopting the practices outlined in its request, LDEQ estimated that the New Orleans area could be free of debris within six months.

Then Hurricane Rita struck southwest Louisiana, adding its destruction to a state already reeling from a devastating blow.

On October 21, 2005, an NAA was issued by EPA headquarters. This NAA acknowledges:

The flooding of the City of New Orleans and nearby communities following Hurricanes Katrina and Rita poses particularly difficult challenges for recovery and reconstruction efforts. Louisiana estimates that the hurricanes and floods left as many as 260,000 homes structurally unsound or otherwise uninhabitable. The State believes as many as 170,000 of these structures, a significant fraction of which are residences, may contain asbestos, lead paint, or other hazardous materials. The volume of debris from the demolition of these structures plus other debris from the hurricanes and floods is overwhelming.

In its October 2005 NAA, EPA offered the following response:

EPA at this time is exercising its enforcement discretion to grant LDEQ a no action assurance for the federal asbestos NESHAP for limited demolition and disposal of asbestos-containing waste material in the parishes noted above, in support of parametric evaluation burns, as further described below. To qualify for the no action assurance, those activities must be carried out in accordance with the LDEQ guidelines, Appendix B to this letter (concerning parametric evaluation burns), and the conditions set forth in the attached document entitled "EPA's Conditions For Granting A No Action Assurance And Associated Recommendations For LDEQ Asbestos Demolition And Disposal Procedures For Jefferson Parish, Orleans Parish, Plaquemines Parish And St. Bernard Parish In The Aftermath Of Hurricane Katrina And Hurricane Rita." The conditions are also accompanied by recommendations. As a further condition of this no action assurance, LDEQ must take all necessary steps to prevent or minimize any increased risk to human health and safety. At this time, the no action assurance does not extend to any other federal requirements that may apply to the limited demolition and disposal of asbestos-containing material in support of the parametric evaluation burns or to any other demolition and disposal of structures in the New Orleans area under the State's proposed plan.

The NAA was of limited duration and scope:

This no action assurance will extend for a period of 6 months from the date of this letter and will only apply at present to demolition and burning carried out for purposes of Appendix B. After completion of Appendix B and evaluating the data,

EPA may provide, as appropriate, a written notice to LDEQ that the no action assurance is being extended to further demolition and burning, subject to the conditions outlined in the attachment. As part of that evaluation, EPA will also consider whether the no action assurance should extend to other federal requirements that may apply to the demolition and disposal of structures in the New Orleans area under the State's proposed plan. Prior to the expiration date, the situation will be reviewed to determine if this no action assurance and accompanying conditions need to be modified or revoked. This no action assurance applies only for the specified activities in the parishes noted above.

As the ACD burn test project was being developed after the October 2005 NAA, LDEQ began development in November 2005 of a protocol for compliance with its asbestos LESHAP regulations.[10] In January 2006, LDEQ forwarded a draft "LDEQ Protocol to Comply with the NESHAP and LESHAP Regulations" to EPA.

As a result of EPA and LDEQ work on this protocol and extensive discussion of the issues, which included a joint LDEQ/EPA Region 6/EPA Headquarters meeting in Baton Rouge, EPA issued an NAA on February 3, 2006. This NAA provided regulatory flexibility as follows:

residences that are subject to a government issued demolition order based on the residence being 1) structurally unsound but not necessarily in danger of imminent collapse, or 2) moved off of its foundation, to be treated as though the demolition order is based on a determination that the house is structurally unsound and in danger of imminent collapse. Under section 61.145(a)(3) of the asbestos NESHAP regulation, buildings subject to a government issued demolition order based on a determination that the building is structurally unsound and in danger of imminent collapse are not subject to otherwise applicable requirements for inspection and removal of asbestos prior to demolition." The effect of the February 3 No Action Assurance allowed residences subject to government issued demolition orders based on the structures being unsound or moved off their foundations to be demolished and disposed of in accordance with the streamlined requirements of section 61. 145(a)(3).

The NAA further allowed this determination to be made for groups of structures (i.e. blocks or subdivisions). This NAA was effective for twelve months from the date of issuance.

On February 24, 2006, EPA extended the February 3, 2006 NAA as follows:

the February 3, 2006 No Action Assurance to residences that are subject to government issued demolition orders because they are uninhabitable for other environmental reasons (e.g., from excessive flood damage rendering the home uninhabitable). Under this No Action Assurance, as under the February 3 action, such residences may be treated as though they are subject to government issued demolition orders based on a determination that they are structurally unsound and in danger of imminent collapse and thus subject to section 61.145(a)(3) of the asbestos NESHAP regulation. In other words, LDEQ, the [Corps], local governments, or persons acting under direction of any of these governmental entities, may apply to such residences the NESHAP requirements governing buildings that are ″structurally unsound and in danger of imminent collapse.″ As noted above, for such buildings the asbestos NESHAP dispenses with prior inspection and removal of asbestos but requires notification and proper handling, transport and disposal. EPA is taking this action because it recognizes the necessity of addressing a number of residences not covered by the earlier No Action Assurance, but in need of expeditious demolition and removal.

The February 24, 2006 NAA also extended the NAA coverage to local governing bodies and indicated that "since the enhanced C&D landfills, as well as Louisiana's permitted Type I and Type II landfills are required by Louisiana to either meet or exceed federal disposal standards under the NESHAP, EPA will defer to the State to set disposal location priorities." EPA also indicated that "our staffs are revisiting the use of Air Curtain Destructors and grinders as means of debris volume reduction to further assist in addressing the lack of adequate landfill space."

In a letter dated March 1, 2006, EPA indicated that the "LDEQ Protocol to comply with the LESHAP Regulations" was consistent with NESHAP regulations and/or the NAA letters of February 3 and February 24, 2006. At this time, LDEQ, local governments, and federal partners finally had a consolidated roadmap for demolition and recovery efforts as they pertained to the asbestos NESHAP. Recovery work was able to move forward.

The length of time necessary to obtain the NAA from EPA resulted in unnecessary delays in the recovery. The need for EPA guidance and/or assurance as to the

[10]As a delegated program, LDEQ had adopted asbestos regulations which in most cases mirror the Federal language, but which are in some areas more stringent.

asbestos NESHAP's application was foreseeable, given the inevitability of a disaster to a heavily populated area, whether from hurricane, earthquake, tornado, flood, or other causes.

B. Lack of Clear Guidelines for Use of Tools/Methods To Meet Disaster Needs

No federal guidelines existed regarding use of tools and methods to manage hurricane or other disaster related debris. For example, due to the amount of debris, the LDEQ considered burning as a possible method for managing some hurricane generated C&D debris. However, upon consultation with EPA, several issued were raised, including but not limited to the asbestos NESHAP.

The LDEQ attempted to work with EPA and FEMA to conduct a test burn of C&D material to gather appropriate data and information to support fact based decision making. The scope of the test burn was expanded exponentially over time, and in the final discussions, no funding source was available to conduct the burn as designed.

The scale of the combined disasters caused by Hurricanes Katrina and Rita only highlights the need for a variety of debris management tools and methods that both state and federal partners can agree are protective of public health, safety, and welfare and the environment in advance of the next disaster.

C. Lack of Coordination in Granting Regulatory Flexibility

Since the issuance of the emergency orders, an issue has been raised that the following authorizations of unpermitted water discharges may violate the Clean Water Act:

1. discharges from potable drinking water plants,
2. discharges from temporary housing, and
3. discharges from debris management sites.

As noted above, people in a disaster area must have drinking water, sanitary facilities, shelter, and fuel.

EPA advised the LDEQ to use its enforcement discretion, i.e., give no action assurances, rather than authorize the discharges. Although the no action assurance manifests the agency's determination not to prosecute violations, it does not provide relief or protection from potential citizen suits and other third party suits.

Furthermore, EPA has an interest where federal programs are implicated, such as Clean Air Act, Clean Water Act, and RCRA programs, when the state has been delegated program authority. The LDEQ was able to provide necessary regulatory flexibility to respond to the emergency through its emergency orders, but could offer no relief or assurance from similar federal requirements or the threat of overfiling by EPA. Regardless of the type of environmental regulatory authority in place, in the aftermath of a disaster, the public has a right to expect that those with authority will work together in a coordinated way to make decisions protective of human health and the environment and that the public can rely upon the regulatory flexibilities provided through a rational process of decision making that takes into account the practical needs of those in the disaster area.

D. Lack of Coordination, Blurring of Lines of Responsibility

FEMA, EPA, LDEQ, and the Corps were all members of the debris mission task force, as noted previously in the Debris Mission Task Force section. The LDEQ expected that agencies would implement their portion(s) of the debris management plan or other response and recovery activities, and that deference in environmental matters would be given to environmental agencies. As a result, the LDEQ did not expect that FEMA would independently attempt to reevaluate receipt of hurricane debris at Gentilly Landfill, after the EPA and the LDEQ had approved that site for receipt of such debris. EPA and LDEQ were the debris mission partners with responsibility for environmental considerations and compliance at hurricane debris disposal sites, and the LDEQ had approved the site operation plan, with EPA's concurrence.

This unexpected insertion by FEMA into a smoothly running collaborative process caused direct, foreseeable impacts, not least of which was the need for both LDEQ and EPA to commit resources to addressing the various levels of concern expressed by the public, media, regulated community, and government, including this very committee, that understandably arose.

One example of the detrimental consequences of violating this principle occurred with regard to the approved use of Gentilly Landfill to receive hurricane related C&D debris. The LDEQ issued a standard permit to Gentilly on December 28, 2004. LDEQ then issued an emergency authorization to the facility to start receiving hurricane related C&D debris on September 29, 2005. Shortly thereafter, the Corps began sending a substantial amount of C&D debris to this facility.

At FEMA's request, EPA performed an investigation and analysis concerning the potential federal CERCLA liability for use of the Gentilly Landfill and issued a memorandum November 11, 2005, Exhibit 11. In EPA's opinion, the use of this facility to receive hurricane related C&D waste would impose no CERCLA liability on FEMA. The memo offered "recommendations for current usage of the landfill to avoid a release of hazardous substances that would necessitate a superfund response." EPA's findings and conclusions were consistent with the prior study performed by the licensed engineering firm of EE&G, the Corps' subcontractor.

Without discussion or consultation with or notice to its debris mission partners LDEQ and EPA, FEMA commissioned a study by National Infrastructure Support Technical Assistance Consultants (NISTAC) to examine the potential impact by the Gentilly Landfill on the environment due to its use as a C&D landfill to receive hurricane related C&D debris. NISTAC's draft report concluded that FEMA could be exposed to high risk of future environmental liability based on current conditions and environmental history of the Gentilly site.

Time and effort was required by both LDEQ and EPA, first to review, then to consult together, and finally to refute the findings of the draft NISTAC report prematurely released. See Exhibit 18, February 16, 2006 LDEQ press release entitled "DEQ refutes claims in FEMA report concerning Gentilly Landfill." These expenditures reduced the resources available to focus on priority debris mission and other tasks.

Based on the never finalized NISTAC report, FEMA instructed the Corps to limit the amount of debris sent to Gentilly Landfill on a daily basis to 5,000 cubic yards per day, which resulted in a substantial reduction from daily intake at the facility. Reduction of the amount of debris sent to Gentilly Landfill potentially had the following impacts: increased time, distance, and expense for disposal.

E. Illegal Dumping Has Gotten Worse

The volume of hurricane related debris from the two storms, combined with congestion at the facilities approved to receive such debris, and volume limits imposed unilaterally by FEMA have likely contributed to an increase in illegal dumping, including illegal dumping at night. The LDEQ, although receiving an increased number of complaints about such dumping, had and has insufficient resources to provide adequately secure surveillance activities. The impact of the 2005 hurricane season exacerbated what was already a shortfall of resources to deal with illegal solid waste disposal statewide.

Solid waste issues for illegal dumping are mainly the province of local governments. Traditionally, LDEQ field inspection services in the area of solid waste focus on permitted landfills. However, complaints, including those concerning illegal dumping, are investigated as logged into the LDEQ's Single-Point-of-Contact system.

In construction and demolition activities, as with most business operations, time means money. The increased waiting time at local landfills and landfill operating hours contributed to increased illegal dumping; piles of C&D debris were discovered within a short distance of the landfills' entrances.

Added to the commercial or business factors fostering increased illegal dumping were factors that may contribute to illegal dumping by individuals. With the discontinuation of curbside waste pick-up, residents returning to the area faced several challenges, including the following: (1) local governments set time frames to gut or demolish homes; (2) the uncertainty of programs to assist with rebuilding costs or needs; (3) the uncertainty of the return of utilities or development to certain areas; and (4) the high cost of contractor work, including demolition and debris removal.

Because of the loss of basic city services necessary for public health and safety, available local government resources were focused first on restoring those services. The loss of a police presence in various areas resulted in increased illegal activities, creating a security concern for surveillance personnel, especially for night surveillance in largely uninhabited areas where illegal dumping occurs. As illegal solid waste dumping has increased, it has become a serious threat to human health and the environment—LDEQ investigators have discovered illegal disposal of asbestos waste, medical and veterinary products, white goods, and remnants of car crushing operations, etc., in the hurricane affected areas.

VI. RECOMMENDATIONS AND REQUESTS

A. National Plan or Guidelines for Regulatory Flexibility for Emergency Response

EPA, in consultation with state agencies and appropriate federal agencies, should develop a national plan or guidelines that provides for environmental regulatory flexibility and debris management necessary to respond to emergencies. At a min-

imum, this plan should provide for a process to obtain and provide authorization of activities necessary to respond to the emergency that would normally require a permit from the state environmental agency or the EPA. Even more useful would be a plan that includes agreed processes, tools, methods, guidelines, etc. This would require all affected agencies reaching consensus together before the disaster occurs.

Regulatory flexibility would include guidance or instructions for achieving compliance under disaster conditions or relief from compliance and how to obtain it. Reporting requirements, for example, are typically extended or waived when the communication infrastructure has been affected or there has been an evacuation or substantial damage.

The LDEQ suggests, based on its recent experiences, that the following areas be included, at a minimum, in the national plan/guidelines to achieve consistency in federal and state disaster responses and to clarify public expectations in environmental matters:

- authorization of necessary water discharges, e.g., from potable water treatment plants and temporary housing locations;
- requirements imposed on hurricane debris management sites;
- selection criteria for debris management sites;
- environmental evaluation methods and tools (including, e.g., sampling protocols); and
- demolition and disposal operations' compliance with the asbestos NESHAP, etc.

The plan or guidelines should also address the tools and methods appropriate for debris management, such as land disposal, chipping, grinding, recycling, and burning. There should be studies of these various debris management tools, including funding to cover the cost of testing to establish the most efficient methods of disposal of disaster related debris, e.g., trial burn of construction and demolition debris, to properly evaluate burning as a tool for disposal. Accordingly, the LDEQ recommends that funding be made available to properly evaluate the various debris management tools, including assessment of burning as an option for management of disaster related C&D debris. All necessary agencies should participate to develop the consensus on each tool's appropriateness for use. As new technologies and tools become available, they should also be evaluated and incorporated into the plan or guidelines as appropriate.

Determination of anticipated emergency response and recovery needs for regulatory flexibility while protecting human health and the environment would allow better utilization of resources, avoid delay, and speed recovery.

B. Lines of Authority and Tasked Responsibility Should Be Respected

Federal emergency management processes and authority should respect to the maximum extent possible (i.e., unless national security is at issue) decisions and determinations made jointly by federal and state agencies with jurisdiction over human health and the environment. Specifically, on environmental issues, non-environmental agencies should defer to environmental agencies who have the primary responsibilities for environmental protection and are staffed and equipped to provide that protection even in an emergency. Environmental agencies, as a matter of routine, must be prepared for and respond to environmental emergencies.

The LDEQ recommends that the principle of respect for lines of authority and task assignments be incorporated in a meaningful way in the national emergency management process. Concerns by one or more agencies outside the area of authority or task force should be raised and left with the authorized and/or assigned agency/agencies. Allowing an agency outside the process to interfere with the mission or task promotes confusion and inefficiency and could have serious adverse consequences.

C. Physical Security for Environmental Priorities

The federal mission should encompass funding for physical security, including armed escort, for necessary and/or priority investigation of threats to human health and the environment by federal and state agencies with jurisdiction thereof, in a disaster area throughout the response and recovery phases. As discussed above, assistance can quickly become critical to combat environmental priorities, such as curbing illegal dumping. The loss of effective law enforcement presence in a disaster area leads to increased problems, including increases in illegal solid waste dumping that can pose a serious threat to human health and the environment.

By maintaining a visible law enforcement presence in the locations impacted or most likely to be impacted, illegal dumping can be effectively suppressed in disaster and recovery areas. Tools such as arrest and seizure and forfeiture of equipment used in the illegal dumping will serve as deterrents as word is quickly spread to the community that illegal dumping is not tolerated.

Because the amount of money that an illegal dumper stands to gain or save can be significant, civilian authorities (LDEQ inspectors) are placing themselves literally into the line of fire with the illegal dumper, especially if the inspector finds himself or herself alone at night confronting several dumpers at one time.

Although the LDEQ has a small criminal investigations unit of five commissioned officers, it would be impossible to field operations for extended periods due to officer fatigue and safety concerns. Additional resources are therefore necessary to provide security needs for LDEQ surveillance to combat the increased illegal dumping.

[Note: Exibits 1—38 to the written testimony of Mike McDaniel can be found in Committee files.]

STATEMENT OF REVEREND VIEN THE NGUYEN, PASTOR OF THE MARY QUEEN OF VIETNAM CHURCH

Mr. NGYUEN. Madame Chair and members of the committee, thank you for the opportunity to be here. My name is Reverend Vien Nguyen. I'm pastor of Mary Queen of Vietnam Church in New Orleans East. I also speak on behalf of the citizens for a strong New Orleans East, a coalition that includes 32 homeowners' associations in New Orleans East that came together in response to the debris handling post Katrina. So in my reference to community, whenever I make that reference, I mean both that church and the Citizens for a Strong New Orleans East.

One of the Senators here expressed an interest in knowing what is the recovery rate, how have we returned. At least in the Vietnamese-American community in New Orleans East, our recovery rate at this point is between 84 to 89 percent returned. Our businesses have returned at 85 percent more than 6 months ago, and we are expecting within 2 to 3 months we can say: It's done, it's over. So that started early on, within 3 or 4 weeks. Our church attendance was already at 1,600 per weekend.

Now, in the midst of the bustling recovery and return and unbeknownst to our community the Chef Menteur landfill was created. And so that you will understand how the landfill is situated. It is separated from Bayou Sauvage National Wildlife Refuge, the largest urban wildlife refuge in the continental U.S., by an 80-foot canal by the name of the Maxent Canal. That Maxent Canal is connected to the Maxent Lagoon directly that runs through the heart of our community and from those, both the canal and the lagoon. Our people have been fishing. Our people have been using water to water their gardens for the last 30 years, 31 years. And not only for their own consumption but also for the wider community where they sell the surplus at the farmer's market for the last 31 years. And when the water came in and breached the intracoastal levee, it flooded the landfill area for 2 months and remained there for 2 months. And then unable to overtop Chef Menteur landfill, it went through the canal, through the lagoon and flooded us.

Now, we were told that we should feel safe because DEQ had already determined that it's C&D that they are going to put in there. Well, we found out later it was enhanced C&D that included treated wood, drywalls that when in touch with water would create hydrogen sulfide, all of these things. And we ourselves, as we gutted our homes, and saw how things were being picked up, debris were being picked up, we can't trust that assurance from DEQ. But our concerns were dismissed. We asked for a lined landfill with leachate monitor. We were dismissed, all of that, all together.

But what we have learned in this process is that we were not the only community that experienced that. Oakville, this historic African-American community, has the same type of landfill but for the last 18 years 50 feet from their yards and at times the landfill collapsed and fell into people's yards.

And so with all of these concerns in mind, if I may present some recommendations that the citizens of Louisiana request the establishment of and participation in a multi-stakeholder committee which will include environmental experts and community leaders. The committee will also act as a Federal advisory committee to address problems brought forth in today's hearing in disaster debris issues. It will also identify solutions towards creating a comprehensive waste management plan that includes regional waste planning for flood-prone communities and a plan that promotes recycling, reusing and reducing technology.

We ask that the Senate ask the EPA and the Army Corps of Engineers' Inspector Generals for Federal investigation into an evaluation of Federal and Federally-related responses to debris removal in emergency siting issues.

There are several other recommendations that I presented in writing, but may I add also that we request the full closure and cleanup of waste deposited at the Chef Menteur landfill, any of its environmental releases and its contaminated soil and waters. Thank you.

Senator BOXER. Thank you, Reverend, you're very eloquent.

Ms. Subra.

[The prepared statement of Reverand Nguyen follows:]

STATEMENT OF REVEREND VIEN THE NGUYEN, PASTOR OF THE MARY QUEEN OF VIET NAM CHURCH

Ms. Chairman and members of the committee, thank you for the opportunity to submit this written testimony on Hurricane Katrina debris removal and related matters. My name is Reverend Vien The Nguyen, pastor of the Mary Queen of Viet Nam Church in New Orleans East. I am also speaking on behalf of the Citizens for a Strong New Orleans East (CSNOE), a coalition that includes 32 local homeowner associations originally established to respond to the dumping of Katrina debris in New Orleans East. Henceforth, the Vietnamese-American community in New Orleans East, the Mary Queen of Viet Nam Church, and the Citizens for a Strong New Orleans East will be referred to collectively as the community.

I. BACKGROUND

Taking root after the fall of South Viet Nam in 1975, the Vietnamese community in New Orleans East centers on the Mary Queen of Viet Nam Church in an area known as Village de L'Est. Given that more than 60 percent of Vietnamese Americans in New Orleans pre-Katrina were Catholic, the Catholic churches serving them have long been the center of these communities and their activities. This is evident in Village de L'Est where, before Katrina, over 90 percent of more than four thousand Vietnamese Americans residing within a one-mile radius were Catholic.

After Hurricane Katrina, the Mary Queen of Viet Nam Church became the center of return and recovery from which supplies and food were distributed to all families. Red Cross provided daily hot lunches on the church grounds, and medical mobile units provided healthcare to returnees. FEMA, Catholic Charities and other entities also used the church grounds to provide their services.[1] The church became the main source for information, job postings, and temporary shelter for returnees while they rebuilt their homes. In addition, the church provided shelter for and coordinated more than 1000 volunteers from across the country to help with the post-Katrina cleanup of New Orleans East and parts of St. Bernard Parish. The church

[1]Cotton, Deborah. 26 Jan 2006 From the Ground Up: "We are already back": Vietnamese Church forges Ahead to Rebuild New Orleans East. Katrina Help Center.

was also the center of the region-wide coalition Citizens for a Strong New Orleans East.

The church engaged in political intervention and advocacy. As a result, the community was able to successfully oppose the Bring New Orleans Back Commission's proposal to convert most of New Orleans East into green space. Furthermore, the church and FEMA reached an agreement to house 199 trailers on church grounds for free, and the church asked residents to sign a petition to request that Energy reinstate electricity in Village de L'Est. By the first weekend of November 2005, electricity, water and sewer services had returned. By that time, the number of returnees attending Sunday Mass had reached 1,600. At present, 84 percent-89 percent of Vietnamese American residents have returned, and 85 percent of Vietnamese-owned businesses have reopened.[2] The Vietnamese-American community was the first community in New Orleans to unveil its comprehensive Development Plan on February 3, 2006. This plan has since been fully incorporated into the New Orleans East Development Plan. It has also been integrated into the Unified New Orleans Plan.

II. ENVIRONMENTAL THREATS

In the midst of a bustling recovery and unbeknownst to the community, the Chef Menteur Landfill was created. This landfill is located in wetlands approximately 1.2 miles from the edge of the community (Exhibit A). It is separated from the Bayou Sauvage National Wildlife Refuge, the largest urban wildlife refuge in the continental United States, by the 80-foot wide Maxent Canal (Exhibit B, picture E). This canal is directly connected to the Maxent Lagoon that runs through the heart of Village de L'Est. When Katrina waters breached the levee along the Intra-coastal waterway, it completely flooded the area. The area remained inundated for 2 months.

After flooding the landfill area and Bayou Sauvage National Wildlife Refuge, the water was unable to overtop the Chef Menteur Highway ridge. Instead, it traveled up the Maxent Canal into the Maxent Lagoon, flooding Village de L'Est. Vietnamese-American residents have been fishing from the Maxent Canal and use the water from it to water their gardens. The vegetables from these gardens have been a source of food for families as well as the entire community: residents sell their surplus produce at the weekly farmer's market established in the neighborhood over thirty years ago.

Despite the fact that the community was already bustling with returnees and recovery work, residents learned about the establishment of the Chef Menteur landfill through the local newspaper, the Times Picayune. At the time, the community was told that the debris consisted of construction and demolition materials (C & D). It was later on that the Louisiana Environmental Action Network (LEAN) and the Sierra Club informed residents that the LDEQ had changed the definition of C & D to include household furniture, treated wood, asbestos-containing materials, and drywall wallboards.[3] Research indicates that when gypsum from drywall boards comes in contact with water, it creates hydrogen sulfide in the process of deteriorating. Moreover, treated wood can produce arsenic when mixed with water.[4] Research conducted by Dr. Paul Kemp has shown that the soil surrounding the Chef Menteur landfill is permeable—groundwater can seep up, mix with the waste, and potentially migrate off-site.[5]

The community worked through their city council representative, Cynthia Willard-Lewis, to arrange a meeting with LDEQ and the representatives of Waste Management Incorporation (WMI). In these meetings, the community implored whether it was necessary to deposit debris at 16600 Chef Menteur Highway. They then requested the following protective measures:

A. The facility be equipped with a synthetic liner and a system be established to monitor leachate;

B. A process to be established to segregate debris in order to identify recyclable and reusable materials;

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[2]LaRose, Greg. 02 Oct 2006 Asian businesses drive eastern N.O. recovery. New Orleans CityBusiness.

[3]Louisiana Department of Environmental Quality. April 2006. Justification for Utilization of Chef Menteur C&D Disposal Facility for the Disposal of Hurricane-Generated debris Facility. p. 7-8

[4]Pardue, John. "Anticipating environmental problems facing hurricane debris landfills in New Orleans East". Louisiana Water Resources Research Institute, Louisiana State University.Obtained July 2006 from the World Wide Web: http://lwrri.lsu.edu/downloads/white—paper2006/white%20paper.final.draft2.pdf

[5]Kemp, G. Paul. "Geological Analysis of Chef Menteur Landfill Site, Orleans Parish, Louisiana. School of Coast & the Environment."

C. Serious efforts to be made for reducing the waste stream so that what is deposited at the landfill would be minor and benign C & D debris;

D. The footprint and profile of the waste pile be reduced to minimize the environmental, social, and health impacts on the community.

The community's requests were dismissed. Both LDEQ and WMI continued to insist that it was necessary to deposit debris at the site, and that it was unnecessary to recycle or fear adverse effects due to the C & D designation. Because residents had already witnessed the removal of debris from their neighborhoods without efforts to segregate materials, residents refused to accept LDEQ and WMI's assurances. Temporarily suspending its recovery efforts, the Vietnamese American community came together with the Citizens for a Strong New Orleans East and LEAN to request an injunctive relief against the United States Army Corps of Engineers' authorization for WMI to work on the designated landfill at the United States Federal Court.[6] The court ruled against the community, stating that it had not proved irreparable damage.

After filing a lawsuit in the U.S. Federal Court, we brought our case to the New Orleans City Council. The City Council unanimously decided to call on Mayor Ray Nagin of New Orleans to withdraw his Executive Order, which had suspended zoning ordinances and permitted the Chef Menteur dumpsite.[7] With this resolution, we approached Mayor Nagin and the Director of Environmental Justice of the Environmental Protection Agency—Region 6, the Environmental Justice officer of the Department of Justice, and the Southern Christian Leadership Conference. The Mayor agreed to suspend dumping at the site for 72 hours to allow experts from the city's Sanitation Department, WMI, and the community to test the waste pile. He promised to withdraw the Executive Order should toxic materials be found there.

After engaging in negotiations with Waste Management to access the site, community experts[8] and representatives were allowed to walk on the surface of the waste pile and take photographs. However, they were not allowed to touch any of the materials, as supervised by the Director of New Orleans Department of Sanitation, LDEQ and WMI employees. Although WMI employees reported they had combed the surface of the waste pile and placed a layer of dirt over the waste, community experts and representatives found medical waste, carpets, bedding materials, electronic equipment, treated wood, a full bottle of copy machine toner, a full bottle of automotive oil, paint cans that were either full or partially filled, and other unidentifiable liquid containers. In early May 2006, New Orleans was experiencing one of its worst droughts in a century but a constant flow of dark and filmy water was found at the bottom of the waste pile (Exhibit B, picture C). This water flowed into a trench leading to a pump that constantly discharged water to two earthen holding tanks, which later discharged into the Maxent Canal.

Returning to the negotiating table, WMI and LDEQ required community experts to provide a written protocol within 72 hours. The experts complied. Their protocol demanded a true characterization of the waste pile, which involved digging a 50'x18'x3' trench, cataloguing the materials found, and dividing the materials equally between different teams of experts for independent testing. As an alternative to testing, WMI suggested taking an enclosed bus ride to observe two designated curbside debris removal sites and following the debris truck to observe its dumping at the landfill. Community members were not allowed to ride on the bus and filming was not permitted. LDEQ signed on to WMI's testing protocol. Community experts refused to participate. The issue became deadlocked.

The community then brought its case to the Louisiana State Senate during a hearing by the Senate Environmental Committee in which a resolution calling for a true characterization and testing of the waste pile was approved. The resolution was forwarded to the Louisiana State House of Representatives Environmental Committee for a vote on whether the matter would be brought to the full floor. The Environmental Committee of the Louisiana House of Representatives voted to defer the matter to another time. It was the final pending item in the legislative session.

New Orleans Senators and Representatives then introduced a resolution calling for a true testing of the Chef Menteur Highway landfill. With more than 500 phone

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[6]Louisiana Environmental Action Network vs. U.S. Army Corps of Engineers. U.S. District Court. Apr 2006. No. 06-2020.

[7]Nagin, Ray. 14 Feb 2006. Executive Order CRN-06-03

[8]The community experts present at this preliminary investigation included Dr. John Pardue, the Director of the Louisiana Water Resources Research Institute and Professor at the Department of Civil and Environmental Engineering, Louisiana State University; Dr. Paul Templet, former Director of LDEQ and Professor at the Department of the Coast and Environmental Studies, Schools of Coast and Environment, Louisiana State University; and Wilma A. Subra, a microbiologist and chemist, and President of the Subra Company, Inc.

calls placed by community members, the resolution passed unanimously in both the Louisiana State Senate and House of Representatives.[9]

The community and WMI agreed to mediation performed by the Environmental Justice of EPA Region 6 and the representative of the Whitehouse Initiative for Asian American and Pacific Islander Affairs. At the mediation, WMI refused to conduct meaningful testing and true characterization of the waste pile, even after the EPA offered to provide funding and have the testing conducted by independent experts. As of today, neither a meaningful testing nor a true characterization of the waste pile has been completed.

After mediation failed, the community asked Mayor Nagin not to renew his Executive Order set to expire midnight on Monday, August 14, 2006. Mayor Nagin indicated that he would not renew the order. In response to the Mayor's decision, and with much hesitation, LDEQ withdrew the authorization granted to WMI to operate the site. WMI later filed a lawsuit against LDEQ in Louisiana State Court. The hearing took place on Friday, August 11, 2006.[10] At the hearing, LDEQ submitted a letter from the New Orleans City Attorney written on behalf of the Mayor indicating that the Mayor would not object if LDEQ were to continue its authorization. Using this letter as local clearance, LDEQ reversed its initial decision and declared that it would not terminate the authorization granted to WMI. On Saturday, August 12, 2006, Mayor Nagin publicly announced that he would not extend the Executive Order beyond the six month period and would instead issue a cease-and-desist order at midnight on Monday, August 14, 2006. WMI insisted that it would continue operating the site while seeking an injunctive relief against the Mayor's decision. In order to prevent WMI from continuing to dump, community members engaged in direct action by blocking the entrance to the landfill on the morning of August 15, 2006. On that same morning, a federal judge in the U.S. District Court ruled against WMI's injunctive relief plea. The 16600 Chef Menteur Highway landfill had been closed since that day.

III. CONCLUSION

During our struggle against the Chef Menteur Highway landfill, the community has learned populations throughout the region are dealing with the same issues with Hurricane Katrina debris. These materials legally forbidden from being dumped directly into the ground were allowed to be so according to LDEQ's expanded definition of C & D debris. Furthermore, landfills have usually been created near minority communities which neither have the organization, the voice, nor the resources to fight for their rights to an equal, healthy environment. The Industrial Pipe Landfill in Oakville, Louisiana is a blatant example of this environmental injustice. The waste pile at this landfill is only fifty feet away from the edge of an historic African American community (Exhibit B, picture I). Flocks of seagulls constantly hover over the waste pile and fire has broken out more than once even though it supposedly only contains inert matters[11] (Exhibit B, picture K). The 40' waste pile has occasionally collapsed and fallen into Oakville residents' backyards. The community has been fighting against this landfill for seventeen years to no avail. After Katrina, the Industrial Pipe Landfill took in storm debris which included rotten freezers and refrigerators (Exhibit B, picture J). Now, a horrible stench fills the air. Industrial Pipe's latest violation documents a fish kill of 5,000 by an illegal discharge of water. LDEQ has given no opportunity for a public hearing on the settlement of this issue (Exhibit F).

LDEQ's database reports that there are over 200 illegal dumpsites throughout the state. In addition to three major landfills in New Orleans East, there are also twenty-three illegal dumpsites and thirteen illegal automobile junkyards—all in the middle of the wetlands and many within sight of the official Old Gentilly Landfill (Exhibit B, picture A). The majority of these wastes documented range from commercial, household, and C&D waste. One illegal dumpsite, an old composting facility, has been burning for more than a year (Exhibit C). Throughout this 7,000 acre area of New Orleans East, landowners are rarely found onsite. The state agency thus at its best issues compliance orders and civil actions, but often has to reinvestigate and turn in another compliance order if the landowner has been evicted or has passed away.

Although the Army Corps of Engineers has confirmed wetland violations and have taken recent actions to cease-and-desist operations, dumping still continues (Exhibit

[9]Duplessis, Ann. Senate Concurrent Resolution 138

[10]Waste Management of Louisiana, LLC vs. LDEQ. 19th Judicial Court District Court. Parish of East Baton Rouge

[11]The latest fire burned for days after Katrina. 11 Apr 2006. Growing Landfill Fuels Feud in Plaquemines Community; Residents Cry Foul; "Dump Defends Moves," Times-Picayune

D). Just this past August, a hauling truck of CERES, a major contractor for debris removal under the Corps of Engineers, was found at an illegal dumpsite (Exhibit E). Before and after Katrina, the lack of enforcement by state agencies, local entities and the lack of a comprehensive solid waste management policy which strongly focuses on recycling, reusing, and reducing before dumping into landfills; and the absence of meaningful venues for community participation have all contributed to the grave environmental problems Louisiana has been facing and that hurricanes Katrina and Rita brought to the surface today.

Hurricanes Katrina and Rita were natural catastrophes which wreaked a lot of unavoidable havocs. They become tragedies when people create additional avoidable harms to their communities and the environment. We believe that the U.S. Congress, beginning with the United States Senate Committee on Environmental & Public Works, can assist in reversing some of the avoidable harm caused.

IV. RECOMMENDATIONS

With the above issues in mind, the community requests the following recommendations to move forward in disaster planning and to protect the quality of life for all residents in Louisiana:

Recommendation 1: Citizens of Louisiana request the establishment of and participation in a multi-stakeholder committee which will include environmental experts and community leaders. The committee will also act as a Federal Advisory Committee to address problems brought forth in today's hearing on disaster debris issues. It will also identify solutions towards creating a comprehensive waste management plan that includes regional based planning for flood-prone communities and a plan that promotes recycling, reusing and reducing technologies.

Recommendation 2: Citizens of Louisiana request that the Senate ask the EPA and the Army Corps of Engineers' Inspector Generals for a federal investigation into and evaluation of federal and federally-related responses to debris removal and emergency siting issues of enhanced construction & demolition debris landfills. The Inspector General should also evaluate full compliance of the related laws regarding debris removal and disposal activities such as the Resource Conservation Recovery Act (RCRA), Clean Water Act (CWA) and protection of the wetlands. A multi-stakeholder committee should be established to review and evaluate this environmental compliance.

Recommendation 3: Citizens of Louisiana request that the Senate ask the EPA and the Army Corps of Engineers' Inspector Generals for a federal investigation into and evaluation of federal and federally-related responses to debris removal activities in illegal dumpsite operations that may violate the RCRA Act, CWA, protection of wetlands or other federal laws. It is our belief that contractors hired by the Army Corps of Engineers may have hauled debris to illegal dumpsites. A multi-stakeholder committee should be established to review and evaluate this environmental compliance.

Recommendation 4: We request support from the EPA or USACE to work with the state to investigate the contents of illegal dumpsites, to help state agencies enforce and identify methods for remediation, and to prosecute, to the fullest extent under the law, parties responsible for illegal dumpsite operations, particularly those in New Orleans East.

Recommendation 5: Citizens of Louisiana request Congress to do whatever is necessary to reimburse debris removal activities that focus first on reducing, recycling and reusing technologies. For example, Congress shall look into the reimbursement of deconstruction as a viable activity, and the reuse of clean wood.

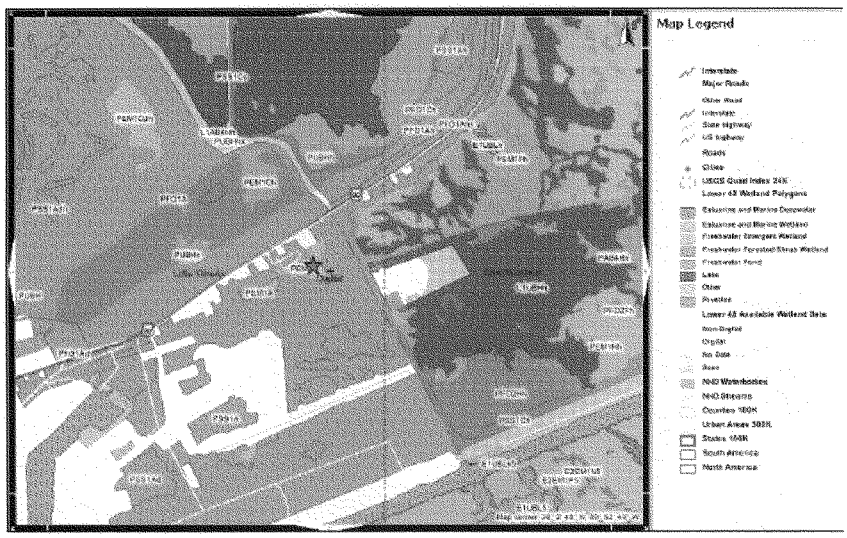
Recommendation 6: Citizens of Louisiana request the full closure and cleanup of waste deposited in the Chef Menteur landfill, any of its environmental releases, and its contaminated soil and waters.

These recommendations are supported by the following organizations: All Congregations Together (ACT) of New Orleans, Louisiana Interfaith Together, Oakville Community Action Group, PICO National Network, National Alliance of Vietnamese American Service Agencies, MQVN CDC, the Louisiana Environmental Action Network (LEAN), the Sierra Club and National CAPACD.

Thank you Senator Boxer, Senator Vitter, Senator Landrieu and distinguished members of the Committee. The community looks forward to working with all of you to create a safe and healthy Louisiana.

Exhibit A

Wetlands in the Vicinity of the Landfill (marked by red star)[95]



Source: Environmental Impact Analysis, Safe and Effective Waste Disposal in New Orleans, Jun 2006, pg. 23

Exhibit B

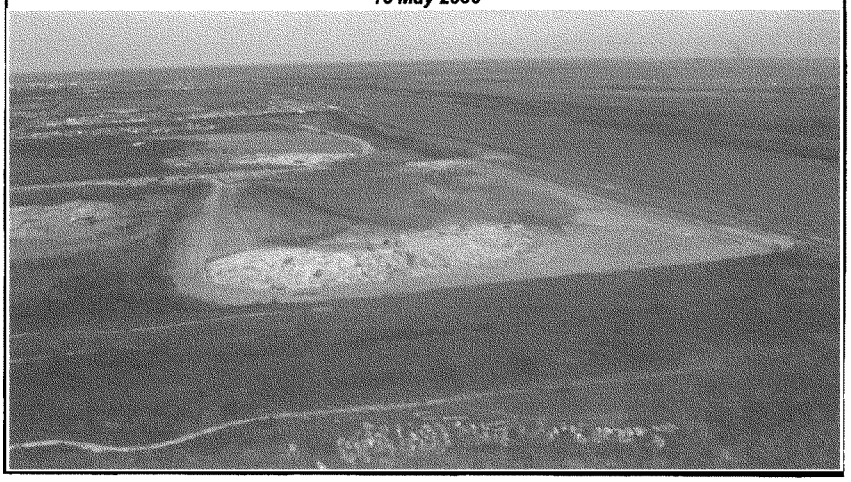
Photos of Katrina Debris Landfills & Illegal Landfill Problems

Father Vien testimony
For Senate Environment and Public Works field hearing
26 February 2007
Edited by Darryl Malek-Wiley
Regional Representative, Environmental Justice Organizer
Sierra Club, New Orleans

Picture A

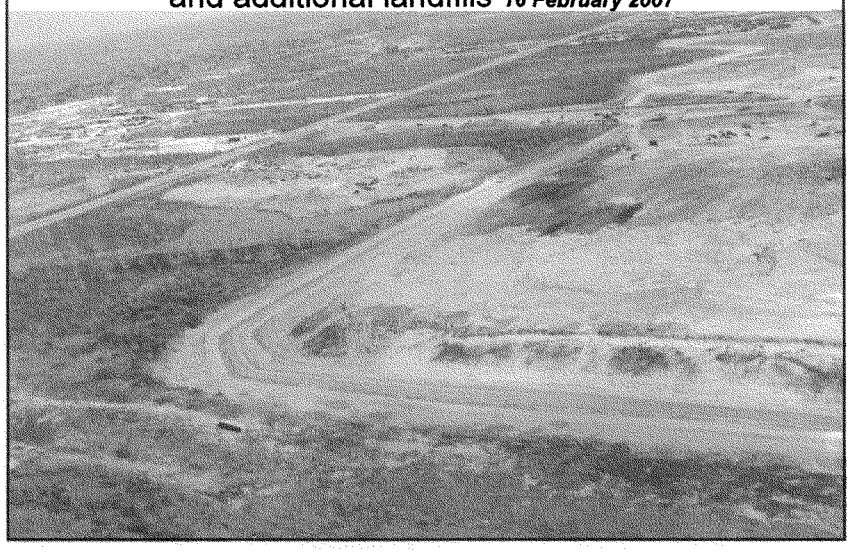
Old Gentilly Landfill looking towards the East

15 May 2006



Picture B

Old Gentilly landfill showing impact on cypress swamp and additional landfills ***16 February 2007***



Picture C

Black water mixing with enhanced Construction & Demolition debris ***taken 16 May 2006***

Picture D

16600 Chef Menteur Hwy Waste Management Dump (looking toward southeast Bayou Sauvage National Wildlife Refuge) ***taken 15 May 2006***

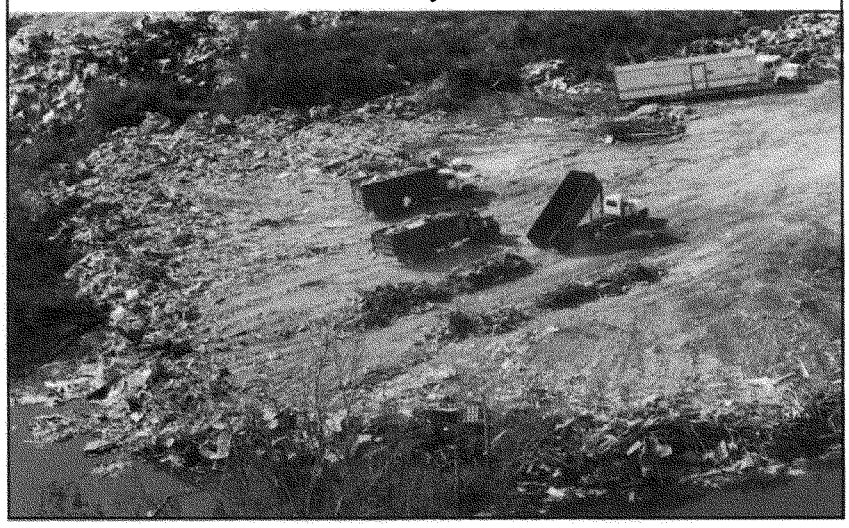
Picture E

Chef Landfill with the Vietnamese community in background past water tower ***taken 16 Feb 2007***

Picture F

Illegal dumping in wetlands west of Old Gentilly Landfill

15 May 2006



Picture G

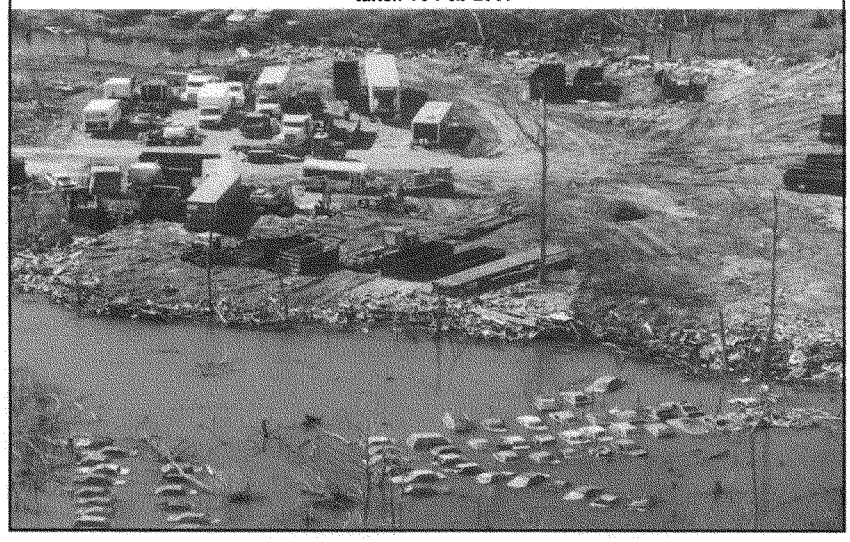
Illegal dump location in New Orleans East

taken 16 February 2007

Picture H

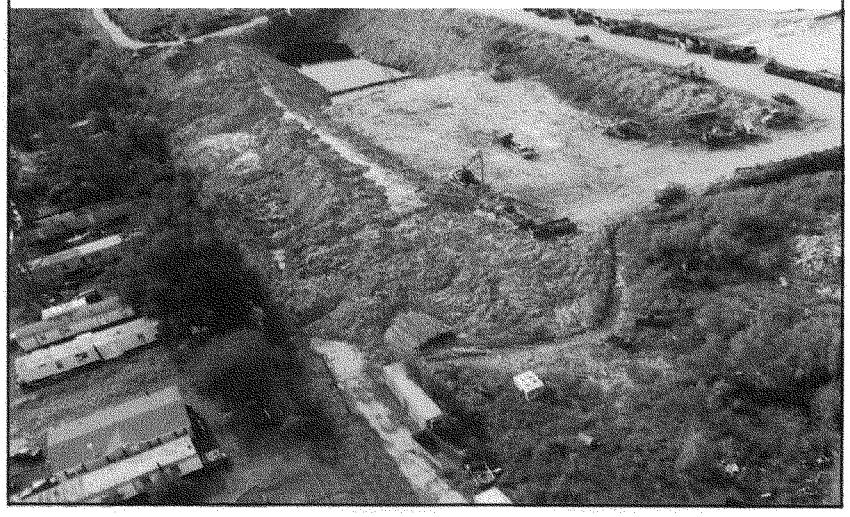
Illegal dump location in New Orleans East

taken 16 Feb 2007



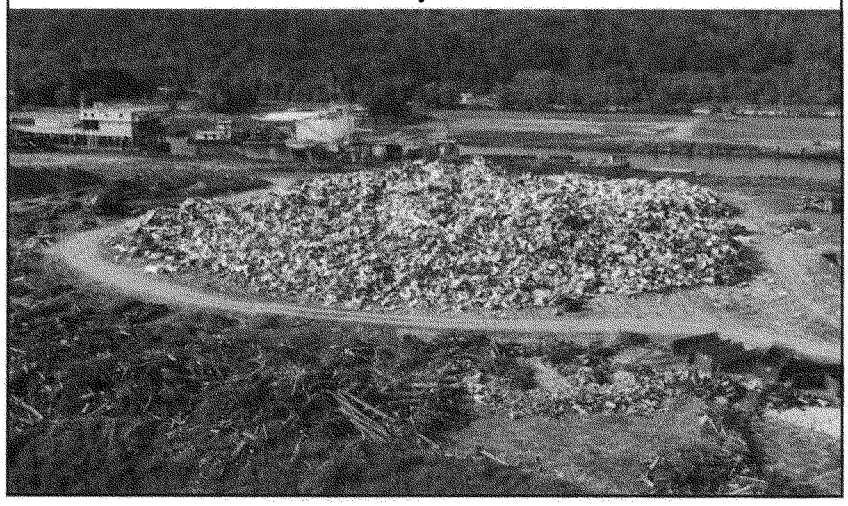
Picture I

Industrial Pipe Landfill next to Oakville Community, Plaquemines Parish ***15 May 2006***



Picture J

Industrial Pipe Landfill stack of "white goods"
Oakville Community, Plaquemines Parish ***taken 15 May 2006***



Picture K

Industrial Pipe Landfill next to Oakville Community,

Plaquemines Parish ***taken 22 February 2007***

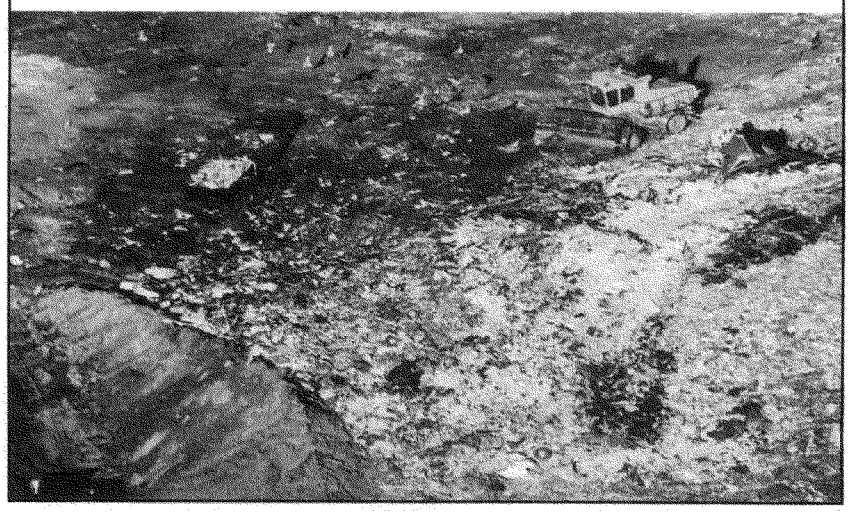


Exhibit C

Excerpts from LDEQ Field Interview Form
Illegal dumpsite burning, 1-29-07

Nu-Earth Organics Site
11440 Almonaster Ave.
New Orleans, LA.

On 01/29/2007 I conducted a visual inspection of the site to view site conditions and status. The following AREAS OF CONCERN were found at the time of this inspection:
(1) Area of Concern- Inspection found that there is open burning of the stable bedding type waste taking place on the subject property. The open burning of regulated solid waste in the form of stable bedding waste is an Area of Concern in accordance with LAC 33:VII.315.Q.
(2) Area of Concern-Inspection found that regulated solid waste in the form of household type garbage has been deposited on the site without a permit or other authorization from the Department. The deposit of regulated solid waste at a location not permitted or authorized to receive such waste is an Area of Concern in accordance with LAC 33:VII.315.E.
(3) Area of Concern-Inspection found exposed previously deposited regulated solid waste in the form of construction and demolition type debris on the subject property. The previously placed earthen cover/cap has been disturbed and/or removed. Failure to maintain the integrity of the earthen cover that was placed over previously deposited construction and demolition type debris is an Area of Concern in accordance with LAC 33:VII.315.A.
(4) Area of Concern- Inspection found that leachate produced from storm water that has come in contact with the stable bedding type waste stockpiled on the property was being discharged to the Almonaster roadside drainage ditch. The discharge of contaminated storm water from the site without a permit or other authorization from the Department is an Area of Concern in accordance with LAC 33:IX.501.D.
No further comment offered.
mds

LDEQ Inspector findings:

(1) Open burning, New Orleans Fire Department has continually extinguished fires due to the composting material.

(2) Regulated solid waste found

(3) C&D debris found and earthen cover is disturbed.

(4) Leachate produced from contact with waste and storm water that has been discharged to the Almonaster drainage ditch.

Exhibit D
USACE Cease and Desist Order

AC
Sec

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX [illegible]
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF:

MAY 9 2006

Operations Division
Surveillance and Enforcement Section

SUBJECT: Violation No. MVN-2006-1483-SU
AI # 28107

Mr. Charles Hampton
Hamp's Enterprises
1319 Newton Street
New Orleans, Louisiana 70114

Dear Mr. Hampton:

On April 11, 2006, we observed and photographed the unauthorized deposition of fill material in wetlands relative to your Construction and Demolition debris landfill operation. This work was performed on property located on and south of Almonaster Blvd. in Section 43, Township 12 South, Range 12 East, Orleans Parish, Louisiana.

The work described above has been determined to be in a wetland, a water of the United States, and is subject to Department of the Army (DA) regulatory authority. This work constitutes a violation of Section 301 of the Clean Water Act (CWA). This letter is an official notice of violation.

You are directed not to perform or allow any further unauthorized work at this site until proper authorization has been granted. Failure to abide by this Cease and Desist Order will result in appropriate legal action.

You are further advised that violations of the CWA may subject you to administrative and/or judicial action. Legal action could result in a fine and/or a court order to restore the site to preproject conditions.

A DA permit application cannot be accepted until we determine an appropriate course of action to resolve this violation. To assist us in our evaluation, you are requested to submit a letter of comments explaining why you failed to obtain a DA permit prior to conducting this unauthorized work. Your comments should be submitted to the Chief, Surveillance and Enforcement Section, at the above address.

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

If we do not receive a written response from you within 20 days after the receipt of this letter, we will proceed with appropriate action for resolution of the legal issues based on the information in our files.

Should there be any questions concerning these matters, please contact Mr. Rob Haffner at (504) 862-2274.

Sincerely,

Richard P. Wagenaar
Colonel, U.S. Army
District Commander

Copies Furnished:

Ms. Donna Mullins (6WQ-EM)
Federal Activities Branch
Environmental Protection Agency
1445 Ross Avenue
Dallas, Texas 75202-2733

Administrator
La. Dept. of Natural Resources
Coastal Management Division
Post Office Box 44487, Capitol Station
Baton Rouge, Louisiana 70804

Exhibit E

Excerpts from LDEQ Solid Waste Inspection Report on Unauthorized Grant Avenue Dump

FACILITY DESCRIPTION

Grant Avenue runs between Old Gentilly Boulevard and Almonaster Avenue in New Orleans. Approximately half way between Old Gentilly Boulevard and Almonaster Avenue, at or near 3866 Grant Avenue, there is an unauthorized dump site. The approximate GPS coordinates for this site are 89° 57'0"N, 30°0'46"W.

At this time, the owner of this property is ambiguous. The equipment operator at the site, Mr. Scott Hancock, stated Mr. Ron Torley of Jackson, MS, owns the property. Mr. Torley's telephone number is 601-454-2737. I was unable to make contact with Mr. Torley. Mr. Hancock's business cards indicate that he is employed by Chisholm Trail Construction. Chisholm Trail Construction, Inc. is registered with the Oklahoma Secretary of State's office.

AREAS EVALUATED

Inspectors conducted a physical site assessment.

SUMMARY OF OBSERVATIONS

- The site is an active dump site. At the time of the inspection, there were numerous loads of office and school furniture, such as children's desks, filing cabinets, etc. observed disposed of on the ground. Several bags of municipal waste were also observed disposed of on the ground.

- There is an empty CERES trailer, license plate (Texas) 960 01Z, parked in the dump yard.

- On 8/18/06, inspectors witnessed a dump truck, operated by Dalton's Trucking, dumping construction and demolition debris at this site. The truck driver provided contact information for Mr. Scott Hancock, the equipment operator. At the time of the inspection, there were no facility representatives present.

Facility Name: Grant Avenue Unauthorized Dump
AI: 142713
City: New Orleans
Parish: Orleans
Photographer: Magness, D.
Date: 8/17 & 18/2006
Reason: Incident 90052
Other ID #: LAU004728

Photo #: 3 of 7 Time: 1:35 PM
Description: This CERES trailer was in the dump yard.

*CERES is one of the main contractors for debris removal awarded by the U.S. Army Corp of Engineers.

Exhibit F

Excerpts from LDEQ Compliance Order & Correspondence on Industrial Pipe Fish Kill

LDEQ Compliance Order sent to Industrial Pipe

FINDINGS OF FACT

I.

The Respondent owns and/or operates a Construction/Demolition Debris and Woodwaste Landfill located at 11266 La. Hwy. 23 in Belle Chasse, Plaquemines Parish, Louisiana. The Respondent was granted coverage under Louisiana Pollutant Discharge Elimination System (LPDES) general permit LAG780000 on January 9, 2004, and specifically was assigned permit number LAG780013. This permit expires on August 31, 2006. LPDES general permit LAG780013 authorizes the Respondent to discharge certain quantities and qualities of contact stormwater via an unnamed ditch into Hero Canal, waters of the state.

An inspection conducted by the Department on or about March 16, 2006, in response to a citizen's complaint, revealed that the Respondent caused or allowed an unauthorized discharge of fire suppression water from a location not authorized in LPDES general permit LAG780013. Specifically, the following violations were observed during the inspection:

A. Water used to extinguish a fire of trees and other land clearing debris was discharging/flowing into an unnamed perimeter ditch, thence into Hero Canal, waters of the state. The water that was discharging from the Respondent's facility into the ditch, thence into Hero Canal was black and cloudy in appearance with a very strong septic and burned odor. Hydrolab readings taken of the discharge at the time of the

III.

Respondent did cause or allow an adverse impact to aquatic biota in Hero Canal, waters of the state, as a result of the above-referenced unauthorized discharge. Specifically, observations during the course of the March 16, 2006, inspection revealed approximately five thousand three hundred and seventy (5,370) dead and/or dying fish and other crustaceans in Hero Canal the public boat launch off Walker Road (approximately 3.5 miles from the discharge location). This destruction of aquatic biota is in violation of LPDES general permit LAG780013

Correspondence with Oakville Community Action Group, LDEQ settles case without public comment.

4) Request for a Public Hearing

The Department acknowledges your clients' request that a public hearing be held regarding the above-referenced settlement agreement pursuant to La.R.S. 30:2050.7. Please understand that although the Department is required to invite and receive public comment before signing a settlement proposal, granting a public hearing is discretionary. The Department finds that all issues relating to CONOPP WE-CN-06-0173 have been settled in principle, and the settlement amount of $19,300.00 is fair and adequate. Therefore, we regret to inform you that your clients' request for a public hearing is denied.

Sincerely,

Harold Leggett, Ph.D.
Assistant Secretary
Office of Environmental Compliance

STATEMENT OF WILMA SUBRA, SUBRA COMPANY

Ms. SUBRA. Thank you for inviting me today. My name is Wilma Subra. I'm speaking on behalf of Louisiana Environmental Action Network, Subra Company and the Delta chapter of the Sierra Club. Following Hurricanes Katrina and Rita the Louisiana DEQ used their emergency authority to allow for the disposal of hurricane debris mixed with household hazardous waste, residential waste, industrial waste, commercial waste and hazardous waste in type three construction and demolition debris landfills. The type three landfills are not required to be lined and do not have leachate collection systems. LADEQ has stated that the hurricane debris waste streams disposed of the C&D landfills are relatively benign. However, the waste streams have been documented by scientific experts as being toxic and hazardous, not benign.

The disposal of these various waste streams in the C&D landfills in the greater New Orleans area have resulted in environmental and human health impacts. The EPA has primary authority over air emissions and water discharges from the C&D landfill and the illegal dumps along the Almonaster corridor. The DEQ has delegated authority for air and water, but the EPA has the primary authority under the Clean Water and Air Acts. EPA has also authorized under RCRA, which this committee also has jurisdiction over, and these are the wastes that make up the major part of the C&D demolition debris waste that is being disposed of in both the C&D landfills and in the illegal dumps for those of you who flew over the area.

EPA also has authority over Superfund which can be utilized to address the waste in the illegal dump sites along Almonaster.

FEMA and the corps have exercised their jurisdiction, as you heard in the earlier panel, over collection contractors' disposal locations, quantity of waste and a whole host of other hurricane debris issues. Therefore, the hurricane debris issue falls under the jurisdiction of Federal agencies. The Federal agencies could be held responsible for inappropriate action on the part of the State agencies and should not be allowed to allow the State agencies to sidestep the Federal regulatory authority that results in negative impacts to human health in the environment.

We would like to put forth these recommendations. The waste stream must be characterized and must be addressed in handling and disposal as it is characterized. It is necessary and crucial that all of those waste streams be characterized. They should also be required to be appropriately disposed of based on the characteristics, such as disposal in Subtitle D and Subtitle C landfills and not in the C&D landfills.

EPA should develop more stringent siting requirements for debris management and disposal facilities that consider, as you have heard, flood plane, impact on flood protection systems, protection of water and air resources, protection of human health and the environment.

We would like to propose this recommendation for debris management: Establish a regional based integrative waste management plan that provides for sufficient disposal capacity and waste management options on a regional basis in advance of natural disas-

ters. The plan should comply with all regulatory requirements and not allow for the default to waivers.

The current waste that is being handled at this time needs to be addressed in an increased monitoring of the debris for toxicity and hazardous components and proper disposal. You should also look at requiring DEQ to remove the authority to blend all those wastes together. The landfills and illegal dumps being used in the greater New Orleans area are hydraulically connected to the groundwater and surface water resources that you saw as you flew over the area. Gentilly landfill presented to you in figures 1 through 3 in your packet is currently accepting hurricane debris. The recommendation is that it be isolated, all of the waste in the Gentilly landfill be isolated from surrounding wetlands, surface and groundwater without negatively impacting the adjacent flood protection levels.

At Chef Menteur that it accepted waste from April to August of 2006 and that a clean closure occur at the Chef Menteur, which is the one near Father Vien's community and that the evaluation of surrounding surface water and sediment. Industrial pipe, some of the members are here today as an African-American community of Oakville right up against the site, we recommend isolation of the waste and stop the impacts on human health and the environment in their community.

And then the large number of illegal dump sites along Almonaster. 7,000 acres of wetlands is being dumped on. Industrial, commercial and hazardous waste are going in all of those dumps. And it's crucial for——

Senator BOXER. I'm sorry. I going to have to ask to you wrap up.

Ms. SUBRA. It's crucial for the committee to look at the authority of Superfund that the Environmental Protection Agency has to do assessments and use the Superfund regulatory process to remediate those locations. Thank you.

[The prepared statement of Mrs. Subra follows:]

STATEMENT OF WILMA SUBRA, SUBRA COMPANY

INTRODUCTION

My name is Wilma Subra and I am testifying on behalf of Subra Company, Louisiana Environmental Action Network (LEAN), and the Delta chapter of the Sierra Club. The organizations listed above want to give a special thanks to Joel Waltzer and Robert Wiygul of Waltzer and Associates for their assistance in preparing this testimony.

Thank you for the opportunity to testify on the issues associated with the waste management of hurricane debris resulting from Hurricanes Katrina and Rita. I have been involved with solid and hazardous waste issues for more that 30 years and serve as a technical advisor to community groups on the issues of solid and hazardous waste, oilfield waste and superfund. I have served as Chair of the Louisiana Department of Environmental Quality (LADEQ) Solid Waste Advisors Subcommittee, Chair of the LADEQ Rules and Regulations Committee on Solid Waste Reduction and Recycling, Chair of the LADEQ Review Committee on Proposed Solid Waste Regulations, a member of the LADEQ Recycling and Solid Waste Reduction Committee, member of the EPA RCRA Remedial Waste Policy Advisory Committee, member of the EPA Permit Reform Committee, Vice-Chair of the State Review of Oil and Natural Gas Environmental Regulations, Technical Advisor to the National Committee on Superfund, Vice-Chair of the EPA National Advisory Council for Environmental Policy and Technology (NACEPT) and a member of the NACEPT Superfund Sub-committee, member of the EPA National Environmental Justice Advisory Council (NEJAC) and Chair of the NEJAC Gulf Coast Hurricanes Work Group.

HURRICANE DEBRIS WASTE FROM HURRICANES KATRINA AND RITA

The hurricane debris generated by the gutting of flooded homes through-out the impact zone contained sheetrock and insulation, furniture, treated and untreated lumber, municipal solid waste, household hazardous waste, electronic waste, asbestos and many other components. Louisiana Department of Environmental Quality allowed the waste to be disposed of in Type III Construction and Demolition Landfills. Type III landfills, unlike more protective Type II municipal waste landfills, do not have synthetic liners, collection systems for contaminated leachate, and systems for the collection of landfill gas (methane and hydrogen sulfide). Allowing disposal of C & D waste in unlined landfills has been based on the theory that this waste would not produce toxic leachate or gas emissions. This theory, as explained later in this testimony, has proven to be incorrect even with respect to ordinary C & D waste. It is certainly not true with respect to mixed hurricane waste.

LAC 33:VII.721(C) provides the operational requirements and limitations for a Type III, or construction and demolition, landfill. LAC 33:VII.115 de-fines construction/demolition debris as "nonhazardous waste generally considered not water-soluble, including but not limited to metal, concrete, brick, asphalt, roofing materials (shingles, sheet rock, plaster), or lumber from a construction or demolition project, but excluding asbestos-contaminated waste, white goods, furniture, trash, or treated lumber. The admixture of construction and demolition debris with more than five percent by volume of paper associated with such debris or any other type of solid waste. . . will cause it to be classified as other than construction/demolition debris."

In the wake of Hurricane Katrina, the Louisiana Department of Environmental Quality used its authority to allow this banned materials to be placed in Type III landfills. The Declaration provided in section 2.c. that "Construction and demolition emergency debris that is mixed with other Hurricane-generated debris need not be segregated from other solid waste prior to disposal in a permitted landfill." An accompanying, "Hurricane Katrina Debris Management Plan" states that, "[m]aterials approved for receipt at [Type III] sites include roof shingles, roofing materials, carpet, insulation, wallboard, treated and painted lumber, etc." These definitions allow virtually any kind of hurricane debris to be placed at Type III landfills such as the Gentilly or Chef Menteur landfills, as long as they are mixed with C & D waste.

A Second Amended Declaration of Emergency and Administrative Order issued by LADEQ on November 2, 2005, further changed the definition of the waste that could be deposited in a type III landfill such as Gentilly or Chef Menteur. Section 2.d. of this Declaration-which has been carried forward in each of the Amended Declaration of Emergency that have followed-provides that "[u]ncontaminated construction and demolition debris may be disposed of in a permitted type III landfill or a site that has been authorized by the Department for such disposal. For purposes of this Or-der, construction and demolition debris shall be the materials indicated in Appendix D of this Declaration." Appendix D to the November 2, 2005-which again has been carried forward in each subsequent Declaration of Emergency-provides as follows:

The following hurricane generated materials shall be allowed for disposal at a permitted construction and demolition debris (C&D) landfill or a Department authorized site:

- Nonhazardous waste generally considered not water-soluble, including but not limited to metal, concrete, brick, asphalt, roofing materials, sheet rock, plaster, lumber from a construction or demolition project, and other building or structural materials;
- Furniture, carpet, and painted or stained lumber contained in the demolished buildings;
- The incidental admixture of construction and demolition debris with asbestos-contaminated waste. (i.e., incidental asbestos-contaminated debris that cannot be extracted from the demolition debris); and
- Yard waste and other vegetative matter.

The following materials shall not be disposed in a construction and demolition debris landfill, but segregated and transported to a Department approved staging area for eventual management, recycling and/or disposal at a permitted Type II Landfill, unless segregation is not practicable:

- White goods
- Putrescible Waste

(Emphasis supplied)

HURRICANE DEBRIS CHARACHTERISTICS

As noted above, even materials ordinarily classified as C & D waste can result in substantial environmental impacts. A study contracted by the US EPA Office of Solid Waste, conducted a review of the characteristics of leachate generated by construction and demolition (C & D) waste landfills (ICF, Inc., 1994). This report found that C & D landfill leachate contained potentially significant concentrations, compared to drinking water maximum contaminant levels (MCLs) of 1 ,2-dichloroethane, methylene chloride, cadmium, iron, lead, manganese and total dissolved solids (TDS).

Studies performed in the hurricane Katrina and Rita impacted areas have confirmed the findings of the ICF study as well as expanded the areas of concern and toxic treats. In the study performed by Dr. John Pardue, Anticipating Environmental Problems Facing Hurricane Debris Landfills in New Orleans East (October 24, 2006-attached), the disposal of hurricane debris in the Gentilly and Chef Menteur landfills will cause three significant environmental impacts: toxic landfill leachate from the presence of house-hold hazardous waste in the hurricane debris stream, the potential for emissions of toxic reduced sulfur gases from the degradation of sheetrock and wall board, and the potential for leaching of arsenic from treated wood disposed of in the landfills. The disposal of house hold hazardous waste in unlined C & D landfills creates leachate that enters the groundwater and threatens the health and safety of the environment and those who live in the area. Household hazardous waste has been documented as being present in the hurricane debris disposed of in the Gentilly and Chef Menteur landfills. The degradation of sheetrock and wall board disposed of in C & D landfills will degrade and release hydrogen sulfide which will generate odors and cause toxic human health impacts. Large quantities of sheetrock and wall board have been disposed of as hurricane debris in the Gentilly and Chef Menteur landfills. Treated lumber has been documented as a significant component of the hurricane debris and that debris disposed of at the Gentilly and Chef Menteur landfills. The stormwater and landfill waters leach the arsenic from the treated wood and the contaminated waters create leachate that enters the groundwater.

A recent study of hurricane debris in New Orleans performed by the University of Florida and published in Science News, February 3, 2007, Quantities of Arsenic-Treated Wood in Demolition Debris Generated by Hurricane Katrina (copy attached) confirmed the threat from arsenic treated wood waste. The study calculated that the chromate copper arsenate (CCA) treated wood disposed of as hurricane debris in Louisiana and Mississippi contained 1,740 metric tons of arsenic. The Environmental Protection Agency in 2004 banned the use of CCA as a treatment chemical in residential projects due to its toxicity. The disposal of CCA treated wood as hurricane debris in unlined landfills allows the arsenic to be leached from the treated wood and impact the landfill leachate and contaminate groundwater re-sources.

FEDERAL REGULATORY AUTHORITY OVER DISPOSAL OF HURRICANE DEBRIS STREAMS

The hurricane debris waste streams with all of the non-C & D components were and continue to be disposed of in unlined Type III C & D land-fills (permitted and non-permitted) as authorized by the Louisiana Department of Environmental Quality. A substantial quantity of hurricane debris containing unknown amounts of hazardous materials are also being disposed of in illegal disposal (dump) areas along the Almonaster corridor in New Orleans East.

The inappropriate disposal of toxic and hazardous chemicals in the Hurricane debris pose a threat to surface water and groundwater resources, air quality, and human health in the areas of disposal and ignores and is contrary to Federal regulations. Such inappropriate disposal can also result in sites that fall under Federal authority such as Superfund, CERCLA, and RCRA and will need to be addressed in the future with Federal funds.

Solid waste collection, storage, treatment and disposal activities are regulated by State environmental agencies. The water quality and air pollution issues associated with solid waste storage, treatment, and disposal fall under the jurisdiction of the Federal Environmental Protection Agency. That authority is frequently delegated to the State environmental agencies with the EPA retaining oversight. In the case of the management of hurricane debris, a number of Federal agencies were responsible for making decisions that directly impacted the methods of debris collection, handling, and disposal locations that were used to dispose of the Hurricane debris. These Federal Agencies are FEMA, Army Corps of Engineers (404 Wet-land Permits, Collection Contractors and designated disposal locations), and the Environmental Protection Agency (incident commander directing response activities and monitoring hurricane debris issues).

State agency activities that do not comply with Federally approved State regulations sidestep Federal regulatory authority, and results in a lack of consideration of human health and environmental impacts. The lack of monitoring and enforcement activities, and lack of consideration of long term impacts will lead to substantial detrimental impacts and establish in-appropriate precedence for debris management in future natural and man made disasters. In order to prevent the continuation of such activities by Federal agencies that are not in compliance with their regulatory authority and not protective of human health and the environment, a number of changes must be immediately implemented.

RECOMMENDATIONS FOR CHANGES AT THE FEDERAL LEVEL

WASTE STREAM CHARACTERIZATION AND PROPER DISPOSAL

Based on the experiences gained in disaster debris collection and disposal post-Katrina and academic studies concerning the hurricane debris characteristics, the Senate Committee on Environment and Public Works should use its authority over RCRA and Superfund to work to re-quire waste stream characterization to enable proper management and disposal of disaster debris based on waste characteristics. Based on debris characteristics, require the debris to be disposed of in fully protective RCRA Subtitle D Municipal Solid Waste Landfills and Subtitle C Hazardous Waste facilities in order to be protective of human health and the environment and prevent the generation of additional contaminated sites that will require the commitment of Federal resources in the future.

DEBRIS MANAGEMENT AND DISPOSAL FACILITY SITING REQUIREMENTS

Require the Environmental Protection Agency to promulgate regulations with more stringent siting requirements for debris management and disposal facilities that take into account floodplains, impacts on flood protection systems, protection of water and air resources, protection of human health and the environment and environmental justice concerns.

Regional Based Integrated Waste Management Plans with Sufficient Disposal Options Require the establishment of regional based integrated waste management plans that protect the environment and vulnerable communities in advance of natural disasters. The plans must provide for sufficient disposal options and appropriate disposal capacity on a regional basis that will pre-vent inappropriate disposal of debris in inadequate disposal facilities and in flood prone and vulnerable areas. The disposal options must comply with all regulatory requirements and not default to waivers.

Planning requirements on a regional basis must also include the establishment and implementation of an integrated waste management approach which includes the utilization of the waste management hierarchy methods of reduction, recycling, and reuse prior to disposal in facilities that meet all regulatory requirements. Require all disposal facilities accepting disaster debris to be lined with impermeable liners and have appropriate monitoring systems to insure isolation of the waste from the environment. State environmental agencies must be prohibited from using emergency authorities that allow waste to be inappropriately handled and disposed of in violation of Federal statutes during and following disaster situations.

CURRENT HURRICANE DEBRIS MANAGEMENT AND DISPOSAL RECOMMENDATIONS

For the remainder of the hurricane recovery and rebuilding activities, re-quire increased monitoring of the hurricane debris for toxic and hazardous waste constituents and require disposal of the debris in appropriate locations consistent with the chemical characteristics. Require the agencies to work towards the elimination of disposal of hurricane debris in Type III landfills. Use only RCRA compliant Type ii municipal solid waste landfills that contain synthetic liners, leachate collection systems and landfill gas collection systems. Require the LADEQ to remove the authority to blend the hazardous waste and toxic waste streams with the construction and demolition debris prior to disposal.

For the reconstruction, deconstruction and new construction debris, re-quire separation of waste constituents with proper disposal of toxic waste streams, re-use and recycling of uncontaminated construction debris, and proper disposal in an appropriately permitted and constructed landfill, not a landfill with an exemption or emergency authority. All of the waste streams not included under the C & D authority should be required to be disposed of separately in permitted landfills authorized and permitted to accept such waste streams.

EPA NEJAC RECOMMENDATIONS

The U.S. Environmental Protection Agency, National Environmental Justice Advisory Council (NEJAC) issued a report on The 2005 Gulf Coast Hurricanes and Vulnerable Populations: Recommendations for Future Disaster Preparedness/Response in August 2006. The report recommended the establishment of guidelines on handling and disposing of contaminated sediments and associated hazardous materials. In addition, the report recommended a process to insure that appropriate planning is in place to identify disposal facilities that can handle waste debris and sediment in an environmentally acceptable manner. These recommendations support the recommendations that have been made herein.

SPECIFIC DISPOSAL SITES

In the greater New Orleans area a number of disposal locations have been used for hurricane debris dumping and disposal and have resulted in environmental and human health impacts to vulnerable and environmental justice communities. These locations and their associated inappropriate debris disposal activities have created environmental impacts that deserve individual specific recommendations in order to protect the surrounding environment and reduce the impacts on human health.

GENTILLY LANDFILL - NEW ORLEANS EAST

The Gentilly Landfill was opened in approximately 1960 in the wetlands of eastern New Orleans, off Almonaster Boulevard. It lies directly adjacent to the levees of the Intracoastal Waterway (the same levees that were over-topped during Hurricane Katrina) and except for the area that has been filled with waste, the landfill site is still largely surrounded by wetlands and standing water. The water table "is at or near the elevation of the natural ground surface." Although the Gentilly dump was ordered closed in 1982, the site continued to accept waste until 1986, by which time it covered approximately 230 acres.

Although the Gentilly Landfill remained in part unclosed and therefore in violation of Federal law, in 2002 the City of New Orleans sought to have a permit issued which would allow the Gentilly Landfill to be used as a site to receive construction and demolition debris and wood waste. The facility never met all the requirements for a Type III landfill, and therefore never opened.

On September 29, 2005, following Hurricane Katrina, LADEQ issued a final decision entitled, "Order Authorizing Commencement of Operations" (the, "September 29 Order"), which authorized Gentilly Landfill to allow disposal of hurricane debris. Millions of cubic yards of debris was disposed there post Katrina. As much as 100,000 cubic yards (one hundred million pounds) was disposed in one day, well past the amount the LADEQ now states is the maximum amount that can be safely disposed.

The Louisiana Environmental Action Network sued to require LADEQ to safely dispose of this waste. The case settled with LADEQ agreeing to limit the amount of daily debris entering the facility and to implement more monitoring and safety precautions. In March 2006 FEMA instructed the USACE and Corps contractors to limit the amount of debris they deliver to the Gentilly Landfill for disposal to 5,000 cubic yards per day, primarily out of concern for the integrity of the adjacent levee (experts suggest a one in three probability that the placement of this much debris about one hundred feet from the toe of the levee will undermine the levee itself. See attached report by Dr. Robert Bea of the University of California, Berkeley, October 2006).

GENTILLY LANDFILL RECOMMENDATION

The waste contained in the Gentilly Landfill must be isolated from the surrounding wetlands environment to prevent further migration of chemicals and contaminants from the landfill into the surface waters, wetlands and shallow groundwater surrounding the landfill. The isolation system must not negatively impact the integrity of the flood protection levee adjacent to the Gentilly Landfill. The integrity of the isolation system must be monitored and effectiveness demonstrated on an ongoing bases over the long term. A cap must be required to be constructed over the landfill and keyed into the isolation system to prevent surface water and storm water from entering the landfill and contaminated waste water and landfill gases from leaving the landfill and entering the environment. A prohibition on construction on top of the Gentilly Landfill cap any time in the future must be included as institutional controls.

CHEF MENTEUR LANDFILL - NEW ORLEANS EAST

The Chef Menteur site consists of approximately 100 acres of land that, immediately prior to construction of the landfill, housed, "a complex of open-water impounds created as a result of previous borrow-excavation activities on the Maxent Ridge." In 1991 the city rejected a zoning request to site a landfill across the highway from the site. In 1997 the city rejected another zoning request to place a construction and demolition landfill at the site.

In a particularly compelling letter dated May 19, 2006, the U.S. Department of The Interior, Fish and Wildlife Service (FWS), described the significance of the ecosystem surrounding Chef Menteur: "[T]the coastal wet-lands. . . adjacent to the proposed Chef Menteur Landfill" as "key remaining marsh areas" that provide important habitat for numerous fishes, shell-fishes, birds and other species. According to FWS, "[a]pproximately 340 species of birds (including many migratory species) use the [Bayou Sauvage Refuge] throughout the year. The refuge supports at least one wading bird rookery, and roughly 30,000 to 50,000 waterfowl inhabit the refuge's wetlands during the fall, winter, and early spring months." FWS Let-ter at 1-2. FWS also explained its concerns about the Chef Menteur land-fill:

"Given the scope and nature of the flooding events and the age of many of the buildings to be demolished and deposited in the proposed landfill, we believe that the delivery of materials containing numerous environmental contaminants, such as: lead based paint, asbestos, creosote, arsenic-based wood treatment chemicals, various petroleum products, and a variety of pesticides and household cleaning chemicals would be unavoidable. Placement of such materials in an un-lined landfill, particularly within coastal wetlands, could potentially result in leaching and resultant persistent contamination of ground water, surface water, and adjacent wetland habitats."

Following Hurricane Katrina, Waste Management again began efforts to have the site permitted as an emergency landfill. On February 9, 2006, concurrent with Waste Managements efforts to gain LADEQs emergency approval of the Chef Menteur site, New Orleans Mayor Ray Nagin signed an Executive Order suspending the Orleans Parish zoning ordinance for the site. See Executive Order CRN-0603.

LADEQ granted Waste Managements request for an emergency authorization on Thursday, April 13, 2006. Aside from the emergency authorization, LADEQ had not taken any action to initiate proceedings to issue a permit for operation of the Chef Menteur landfill. Thus, the emergency approval embodied the only authority under State environmental regulations for the facility to operate. The Chef Menteur landfill operated under this emergency authority until July 13, 2006, when Mayor Nagin announced that he would not extend the emergency suspension of the comprehensive zoning ordinance for Chef Menteur beyond its original 6 month period of effectiveness, thus allowing the temporary land use approval for the landfill to lapse on August 14, 2006.

The Chef Menteur landfill is hydraulically connected to the ground water and surface water resources in the area of the landfill. The potential for impacting the environment and human health due to Hurricane waste disposal activities in the unlined cell is sufficient basis for requiring removal and off site disposal of all Hurricane debris disposed of in the landfill.

CHEF MENTEUR LANDFILL RECOMMENDATION

The Chef Menteur Landfill disposal cell must be clean closed. The hurricane debris disposed of in the Chef Menteur Landfill cell must be removed and properly disposed of according to its chemical characteristics. After waste removal, the contaminated soils remaining in the disposal cell must be excavated and properly disposed of. The disposal cell must be certified as clean. Monitoring wells must be installed and sampled to evaluate the current and future status of groundwater impacts due to the disposal of hurricane debris waste during 2006. The surface water and water bottom sediments in the area potentially impacted by the disposal of hurricane debris at the Chef Menteur Landfill must be sampled and appropriate actions taken to remediate contamination.

INDUSTRIAL PIPE LANDFILL - OAKVILLE, PLAQUEMINES PARISH

The Industrial Pipe Construction and Demolition Debris landfill is located off Highway 23 immediately adjacent to the historic African American community of Oakville in Plaquemines Parish. A forested fresh water swamp and the Hero Canal surround the remainder of the site. The C & D landfill began operating before there were promulgated regulations for C & D land-fills. The Industrial Pipe facility was granted permission to accept hurricane related construction/demolition debris for

disposal in the C & D Landfill and white goods for recycling. The operation of the Industrial Pipe facility has caused negative impacts to the adjacent environmental justice community of Oakville over the operating life of the facility. When the facility began accepting hurricane debris the negative impacts experienced by the adjacent community became extremely severe. The facility has experienced two fires since accepting hurricane debris. One of the fires occurred on March 9, 2006 and burned the wood waste pile and part of the C & D landfill. The fire burned for several weeks and resulted in noxious odors and smoke and the unpermitted discharge of runoff from the fire. The unpermitted discharge caused a fish kill near the Hero Canal. Hurricane debris was dumped in and adjacent to the Oakville community and wind blown debris was dispersed through out the Oakville community.

The debris waste streams disposed of in the Industrial Pipe landfill consist of demolition debris, municipal solid waste, toxic and industrial waste as well as hazardous components. The lack of separation of waste components prior to disposal have resulted in an added toxic burden to the environment and the health of the adjacent community.

INDUSTRIAL PIPE LANDFILL - RECOMMENDATION

The toxic and hazardous hurricane debris waste disposed of in the Industrial Pipe Landfill must be isolated from the surrounding residential area and wetlands environment to prevent further impacts to public health and to prevent further migration of chemicals and contaminants from the landfill into the surface waters, wetlands and shallow groundwater. The effectiveness of the isolation system must be monitored on an ongoing basis and over the long term. The surface water resources and bottom sediments in the water bodies adjacent to the landfill must be sampled and remediated to address the contaminants originating from the hurricane debris.

The soils in the residential area must be sampled to identify the extend of hurricane debris impacts on the residential area. The residential areas impacted must be remediated.

The C & D landfill must be prohibited from expanding and work to phase out and close the existing landfill. The landfill location in close proximity to the residential area, has and continues to severely impact the health and quality of life of the community members and negatively impact the aquatic and terrestrial environment surrounding the landfill.

INDISCRIMINATE DISPOSAL OF HURRICANE DEBRIS IN THE WETLANDS ALONG THE ALMONASTER CORRIDOR IN NEW ORLEANS EAST.

An area of more than 7,000 acres of wetlands along the Almonaster corridor in New Orleans East have been used to illegally dump hazardous, commercial, and industrial waste, municipal solid waste and construction and demolition debris from hurricanes Katrina and Rita. The Gentilly land-fill is also located in this corridor area and is surrounded on three sides by these illegal dumps. The waste dumped at the illegal dump sites have the potential to severely impact the surrounding environment and associated aquatic environments.

Federal agencies (EPA and Corps) have authority over these illegal dumps due to their locations in wetlands and disposal of hazardous waste. Minimal enforcement efforts have resulted in little to no reduction in dumping activities. A number of operators of the illegal dump sites have been referred by Louisiana Department of Environmental Quality to the US Army Corps of Engineers for wetlands violations. The Corps has issued a few cease and desist orders to the operators of the dumps. Dumping continues.

ILLEGAL DUMPS IN NEW ORLEANS - RECOMMENDATION

The Corps must take appropriate action to stop disposal in the wetland areas and require restoration to pre project conditions. The EPA must perform site assessment evaluations under CERCLA and require site re-mediation activities funded by the dump operators, waste haulers and waste generators. The EPA should also determine if the sites qualify for designation as Superfund and address under the agencies Superfund authority.

SUPPORTING ORGANIZATIONS

These comments and recommendations are supported by the following local, regional and national organizations that have been involved in hurricane debris issues since the land fall of Hurricane Katrina in August 2005.

Louisiana Environmental Action Network (LEAN)
Mary Queen of Vietnam Church

Citizens for a Strong New Orleans East (CSNOE)
National Alliance of Vietnamese American Service Agencies Delta Chapter of the Sierra Club
All Congregations Together
Catholic Charities
Asian Law Caucus
Asian American Justice Center
Korean American Resource and Cultural Center
National CAPACD
Vietnamese American Young Leaders Association of New Orleans

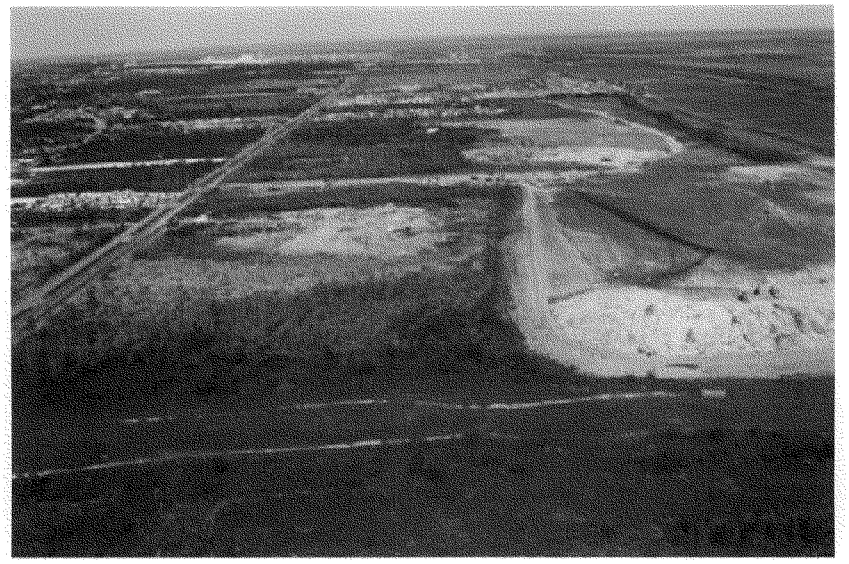


Figure 1: Photo showing Gentilly Landfill, New Orleans East. Almonaster Blvd. to the left and Intracoastal Waterway and levee to the right. The Gentilly Landfill is located adjacent to the Intracoastal Waterway levee system. The waste disposal area to the left, adjacent to Almonaster is one of many illegal dump site in the Almonaster corridor area.

Figure 2: Photo showing hurricane debris being disposed of at the Gentilly Landfill in New Orleans East.

Figure 3: Photo showing close up of hurricane debris being disposed of at the Gentilly Landfill in New Orleans East.

Figure 4: Photo showing Chef Menteur Construction and Demolition Debris Landfill and previously operated municipal solid waste transfer station in New Orleans East. Landfill site surrounded on three sides by open water and wetlands. Chef Menteur Highway in the foreground and railroad in background. Chef Menteur Landfill received hurricane debris from April 2006 to August 2006.

Figure 5: Chef Menteur Construction and Demolition Debris Landfill and previously operated municipal solid waste transfer station in New Orleans East. Hurricane debris can be seen being disposed of in the unlined disposal cell.

Figure 6: Photo showing Industrial Pipe Construction and Demolition Debris Landfill, Oakville, Plaquemines Parish. Industrial Pipe C & D Landfill disposes of hurricane debris in the unlined excavation and recycles white goods. The community of Oakville can be seen to the left, immediately adjacent to the Industrial Pipe Landfill to the right. A playground can be seen in the upper left corner with the graveyard just below the playground. Standing water can be seen (upper right corner) in the unlined pit that is being used to dispose of hurricane debris.

Figure 7: Photo showing Industrial Pipe Construction and Demolition Debris Landfill, Oakville, Plaquemines Parish. Hurricane debris disposal activities as seen from across the fenceline of the community of Oakville.

Figure 8: Photo showing illegal dumps along the Almonaster Corridor of New Orleans East. 7,000 acres of wetlands have been and are being used to illegally dump hazardous, commercial and industrial waste, municipal solid waste and construction and demolition debris. Gentilly Landfill is located in the center of the picture. Almonaster Blvd. is to the left and the Intracoastal Waterway and levee is to the right. The illegal dumps are located to the left, above and below the Gentilly Landfill. The illegal dumps extend along the Almonaster Corridor from the Industrial Canal eastward to Interstate 510. The I-510 bridge is visible in the background.

Figure 9: Photo showing an illegal dump along the Almonaster Corridor of New Orleans East. The Illegal dump site is situated near Gentilly Landfill and the Industrial Canal. Hurricane debris and waste is being dumped into standing water.

Figure 10: Photo showing an illegal dump site just off Almonaster Blvd. in New Orleans East. Hurricane debris and waste is being dumped into a marsh and wetland area. The site is situated between Gentilly Landfill and the I-510 Bridge

Figure 11: Photo showing illegal dump site along the Almonaster Corridor in New Orleans East. Hurricane debris and waste is being dumped into standing water.

Figure 12: Photo showing an illegal dump site along the Almonaster Corridor in New Orleans East. The site is situated near the Old Gentilly Landfill. Hurricane debris and waste is being dumped into standing water. Tires and debris are spread throughout the standing area.

Attachment 1:

Gentilly Landfill Potential Influences On Reliability Of Adjacent ICWW/ MRGO Flood Protection Levee

by Professor Robert. Bea, Ph.D.

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October 25, 2006

Subject: Gentilly Landfill Potential Influences on Reliability of Adjacent ICWW/MRGO Flood Protection Levee

The Louisiana Department of Environmental Quality, Office of Environmental Services (LDEQ), has prepared a decisional document that provides justification for the continued operation and utilization of the Gentilly Landfill. LDEQ's justification document includes a slope stability study conducted by Soil Testing Engineering, Inc. (STE), which examines the potential impact of the completed landfill upon the performance of the adjacent Inter Coastal Water Way (ICWW) – Mississippi River Gulf Outlet (MRGO) flood protection levee, in place to protect New Orleans East. This review examines the slope stability study and provides preliminary conclusions regarding both the reliability of its conclusions and the risk implications of the proposed landfill on the adjacent ICWW - MRGO flood protection levee.

In addition to the STE report, entitled "Geotechnical Investigation, Gentilly Landfill, Slope Stability Analyses" (STE, 25 July 2006), and this author's knowledge and experience gained from examining the failure of the New Orleans flood protection system in the aftermath of Katrina, this review is based on information previously provided by LDEQ. It is also based on information contained in the NISTAC report prepared for the Federal Emergency Management Agency, entitled "Potential Impact by the Old Gentilly Landfill on the Environment Due to the Placement of the New Type IIII C&D Landfill" (NISTAC, a joint venture of Dewberry & Davis and URS Group, Inc, 14 February 2006).

STE's slope stability analyses focuses on the final projected condition of the proposed landfill and addresses the likelihood that the proposed landfill will significantly degrade the ability of the adjacent ICWW/MRGO flood protection levee to perform its intended functions. STE concludes that the landfill, completed to its permitted height, shows minimum factors of safety (FS) in the range of 1.2 to 1.35. Factor of safety analyses are based on engineering assessments of the expected weight of the fill, the expected strengths of the underlying soils, and the expected failure mode (slope stability).

Two important ideas are inherent in the slope stability study. First, the term "factors of safety" refers to levels of acceptable risk. The nearer to 1 the factors of safety are, the more likely a failure is to occur. If a system has a factor of safety below one, the capacity of the system is already overwhelmed by the demand being placed upon it. At this point, it is said to be in a state of failure. When the capacity of the system exceeds the demand placed upon it, the factors of safety rise, and the probability of failure diminishes.

The New Orleans flood protection system was previously designed to a factor of safety of 1.3 (referred to as, but in reality not quite, Category Three protection), slightly higher than the 1.2 found here. That provided a one in fifty chance per year of failure. As noted in the Independent Levee Investigation Team's report to Congress, of which your writer was a member, that level of acceptable risk was developed in the 1950's to defend sparsely developed agricultural lands. Factors of 2 to 3 or greater are appropriate for important facilities and densely populated areas. Of note, offshore structures and the Dutch flood protection system are built to a much higher factor of safety, a one in ten thousand chance of failure, known as Category Five protection. In any event, permitting the construction of this landfill is inconsistent with the stated goal of a Category Five flood protection system for the City of New Orleans, which includes New Orleans East.

The second important concept is the reliability of the underlying assumptions imbedded in the Gentilly slope stability model. The more assumptions that are contained in a safety analysis, the more likely some assumptions are

incorrect, and the more probable a consequent failure becomes. Again, New Orleans has just recently experienced the devastating effect of erroneous assumptions and natural variability in the soil properties and other properties in the failure of the flood protection system. A reliability analysis attempts to quantify the risk inherent in uncertain assumptions that constitute part of the model.

In this case, the reliability analyses would explicitly address the uncertainties that are associated with the engineering assessments and the effects of these uncertainties on the reliability of this important flood protection levee. Based on the information contained in the referenced reports, there have been no analyses performed to determine the potential effects of these uncertainties on the justification for continued operation and utilization of the Gentilly Landfill.

Based on the available information, this author has performed preliminary analyses to characterize and quantify the primary uncertainties (natural, model) associated with the projected landfill 'demands' (loads, stresses imposed on the supporting soils), and the 'capacities' of the underlying soil layers to support the projected demands without excessive displacements, and with the associated analytical models. These analyses have not addressed uncertainties associated with human, organizational, and information developments (Bea, 2006).

Given the range of factors of safety cited, the preliminary analyses indicate total uncertainties (expressed as the logarithm of the standard deviation of the slope stability demand and capacity) of 60% to 70%. These values are based on demand uncertainties (primarily dependent on the long-term effective compacted unit weight of landfill) in the range of 40% to 50%, capacity uncertainties (primarily dependent on effective shear strengths of the affected soils) in the range of 30% to 40%, and analytical model (circular arc slope stability) in the range of 20% to 30%. The analyses have assumed that the analyses that have been performed have been based on 'best estimate' values and that there are no systematic 'biases' that have been introduced into the computed factors of safety.

The resulting probabilities of failure (likelihood that the slopes are 'unstable', deform excessively) are in the range of 25% to 37% (Figure 1). These results can be interpreted as about one chance in three (1/3) that the adjacent flood protection levee will be seriously impaired (slope stability failure) when the proposed landfill is completed (2012).

As noted, these results have been based on the premise that the analyses have been based on 'best estimates'. A primary concern identified in these analyses is that of the effective compacted long-term unit weight of landfill (65 pounds per cubic foot, pcf) and the shear strength attributed to the landfill. Consultation with a landfill stability analysis expert (Dr. Raymond Seed, University of California Berkeley) indicated a value of 90 pcf could be more appropriate; such values have been used previously for similar landfills in California. Additional concerns were expressed for the effects of severe rainfall and moisture accumulation in the landfill in further increases in the unit weight. If such an effective unit weight was appropriate for these analyses, this would indicate a significant reduction in the previously cited factors of safety.

Another major element for concern is that of the condition of the adjacent flood protection levee when subjected to the effects developed by intense hurricane surge and waves. The ICWW flood protection levee at this very location overtopped and was subject to severe pressure during Katrina. The lateral force of another hurricane surge, pushing against the levee above ground, coupled with the lateral force associated with the weight of the landfill, pushing in the opposite direction below ground, raise very serious concerns about a shearing effect upon the levee itself. A sheer plane could develop could concentrate in the low strength soil layers that underlie the landfill and the levee (e.g. the very soft clay layer found approximately 20 ft. below the surface). These effects have not been included in the analyses performed to date nor in these results.

Given the potential ramifications of significant degradation in the ability of the adjacent flood control levees to withstand storm surges without breaching combined with the potential damaging and life-threatening effects of significant flooding from such breaches in such conditions, it is clear that probabilities of failure in the range of 25% to 37% are excessive and should not be accepted. We at least should give the people of New Orleans the same level of safety we give our oil infrastructure.

This review of the analyses that have been performed indicates that there are additional conditions (e.g. water saturated fill, storm surge conditions acting on flood protection levee), parameters (e.g. soil displacements), and states (e.g. soils affected by fill leachate) that should be further analyzed using the best available proven technology.

Initial considerations and estimates indicate that such analyses will provide additional information that will indicate the probabilities of failure cited above have been underestimated and that these probabilities of failure are even more unacceptable than indicated above.

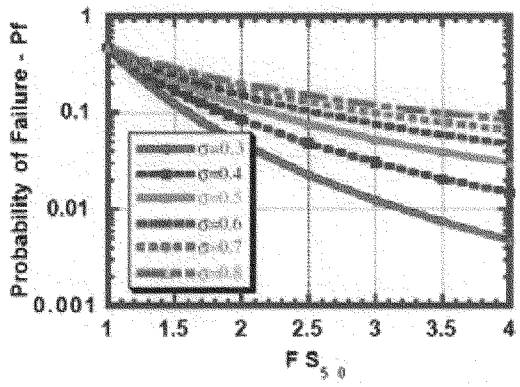

Figure 1: Probabilities of failure as functions of the Factor of Safety (FS50) and total uncertainties (σ)

Explanation of Figure 1. The probability of failure (Pf) is the probability or likelihood that the demand (loads, stresses) imposed by the proposed landfill (final condition) will equal or exceed the capacity of the landfill, underlying and adjacent soils to resist the demand without failing (excessive displacements). Failure is determined as the condition when the imposed demand exceeds the available capacity. The distributions of the slope stability demand and capacity have been evaluated to be well characterized with Lognormal distributions. The factor of safety (FS50) is expressed as the ratio of the median (50-th percentile) demand to the median capacity (this presumes that there are no systematic 'biases' present in the referenced analyses. The factor of safety has been determined from the geotechnical stability analyses. The total uncertainty in demand and capacity (σ) is determined from the standard deviations of the logarithms of the demand (σD) and capacity (σC, σ2 = σD 2+σC 2). The uncertainties in demand and capacity have been determined from the available data on soil strengths, unit weights of the fill, and accuracy of the analytical model employed to determine the factor of safety.

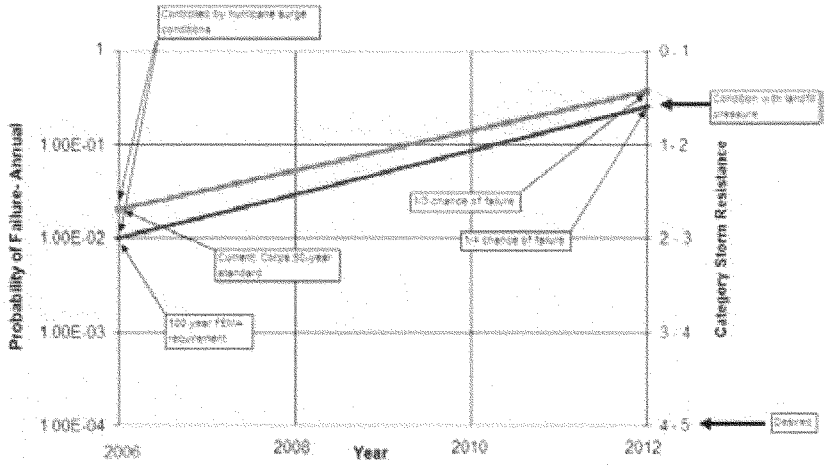

Figure 2: Probabilities of failure and Category Storm Resistance as functions of time

Reference (copy attached)

Bea, R. G. (2006). "Reliability and Human Factors in Geotechnical Engineering," Journal of Geotechnical and Geoenviromental Engineering, American Society of Civil Engineers, Vol. 32, No. 5, pp 631-643.

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Attachment 2:

Anticipating Environmental Problems Facing Hurricane Debris Landfills In New Orleans East

By John H. Pardue, Ph.D., P.E.

Anticipating environmental problems facing hurricane debris landfills in New Orleans East

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1.0 Introduction

The large debris field created by Hurricanes Katrina and Rita has led to a series of decisions by regulatory agencies regarding disposal of hurricane debris. Two of these debris landfills have been sited in eastern New Orleans, the Old Gentilly landfill and the Chef Menteur landfill which has been closed after several months of operation. Central to the debate over the disposal of hurricane debris is the decision to treat hurricane debris within the same regulatory framework as construction and demolition (C&D) wastes, allowing disposal in unlined landfills. An analysis of current debris disposal practices and current research on C&D landfill issues strongly suggests that environmental impacts will result from these landfills in New Orleans East. Three potential environmental problems will be discussed here. the presence of household hazardous waste in the hurricane debris stream, the potential for emission of toxic reduced sulfur gases from these facilities and the potential for leaching of arsenic from treated wood in these landfills. This white paper will discuss the rationale behind these emerging problems and propose recommendations to help mitigate the expected effects.

2.0 Household Hazardous Waste

2.1. **Emerging problem:** The presence of household hazardous waste (HHW) in the hurricane debris stream is widely acknowledged by all parties. As residents and business owners dispose of building contents, a significant amount of hazardous waste is brought to the curb. Diversion of the HHW stream is attempted by the Louisiana Department of Environmental Quality (LDEQ), the U.S. Environmental Protection Agency (EPA) and U.S Army Corps of Engineers (USCOE). As we have observed it, the process consists of these elements. First, the surface of debris piles is visually inspected curbside and the HHW removed. During these inspections, HHW within piles is not recovered unless it is visible, for safety reasons. Once loaded onto trucks, an additional inspection occurs of the top surface of the load from the towers at the landfill site. Again, only the "visible" HHW on top of the trucks has the ability to be seen from the towers. Finally, spotters are used, under some circumstances, to remove HHW from the face at the landfill, itself The efficiency of the diversion process is unknown but evidence from the field demonstrates the difficulty in diverting wastes using these procedures.

First, we wanted to understand the extent of HHW in the debris piles prior to pickup. Observations of HHW in debris piles in St. Bernard Parish were made on May 22, 2006 For these observations, the piles were disturbed and sources of HHW noted (Table 1). Only when the piles were considerably disturbed did the majority of these HHW sources become apparent. Materials included a variety of liquids, aerosol cans, paints, and batteries. All of these were expected from knowledge of HHW sources in typical residences and businesses.

These observations simply confirm that these HHW sources exist at the beginning of the process of debris disposal.

The end of the debris collection process is deposition of the material in the landfill, itself. In an inspection of the surface at Chef Menteur on May 15, 2006 a variety of HHW-containing materials were also observed including batteries (AA, C and D cells), electronic waste, and numerous unlabelled 1 to 5 gallon containers which we were not allowed to inspect or sample. Most significant was an apparent full can (8 oz.) of photographic developing fluid containing solvents (Figure 1). These observations confirm the inefficiency of the HHW process even though they were performed over only a very short visit to the Chef Menteur facility with great restrictions to movement and activity.

At Old Gentilly, LDEQ inspectors, themselves, documented the presence of electronic waste, tires, batteries, paint cans and other HHW in their inspections in the months following Katrina. Photographic evidence at Old Gentilly clearly shows "visible" HHW but like the inspections of the debris loads themselves, visible inspection reveals only a small fraction of what is present in the landfill.

Based on these observations, it is apparent that HHW has entered both the Chef Menteur and Old Gentilly landfills. Observations also suggest routes of exposure of the HHW sources to humans and the environment. Water was seeping beneath the face of the landfill during our visit to Chef Menteur. This liquid, either from rainfall or materials disposed in the landfill, is by definition "leachate", or "water that has come in contact with waste". As the HHW sources described earlier come under the load of the landfill, containers will break, become degraded and leach into this water. This leachate has the potential to be in direct contact with surface water since both landfills are directly adjacent to wetlands. Surface water features at the Old Gentilly landfill likely facilitate the contact of leachate with surface water. During its period of operation, leachate at Chef Menteur was managed by pumping to a lagoon, followed by discharge to the adjacent wetland. Management of leachate at Old Gentilly is unknown.

A secondary route of exposure will be through groundwater. Both landfills are unlined and are not equipped with leachate collection technologies found in Class I landfills. Leachate will migrate through more permeable soil materials beneath the landfills and come in contact with groundwater. The Old Gentilly site is complicated by the presence of municipal waste leachate from previous disposal activities. The history of unlined landfills in the U.S. is clear and does not bear repeating here.

Table 1. Observation in debris piles stationed along streets May 22, 2006

- Alkaline and zinc batteries (AA, AAA, C, D, 9V)
- Insulation (possibly containing asbestos)
- E waste (televisions, computers, microwaves, stereos, scanners, monitors and copiers)
- Numerous unidentifiable containers (with residues)
- Explosives (shotgun shells)
- Fire extinguishers
- Possible medical waste (unlabeled pills, sharps)
- Numerous 20 pound propane tanks
- Extensive carpet and carpet foam
- Extensive drywall
- Extensive lumber (treated and untreated)
- WD-40 and other aerosol cans
- Soaps and surfactants, lye and acid cleaners
- Paints and thinners, varnish, turpentine, and furniture stripper
- Automobile products (gasoline cans, brake fluid, transmission fluid, antifreeze, and motor oil)
- Yard equipment (weed eaters, lawnmowers and unlabeled garden sprayers)
- Herbicides, pesticides, and insecticides
- Fiberglass patching equipment
- Glues and epoxies
- Grease tubes
- Drain cleaners, oven cleaners, glass cleaners, and furniture polish
- Moth balls
- Flea and tick products
- Bug repellent
- Fertilizers
- Pool chemicals
- Bleach, ammonia, and laundry detergent
- Tires
- Fluorescent light bulbs

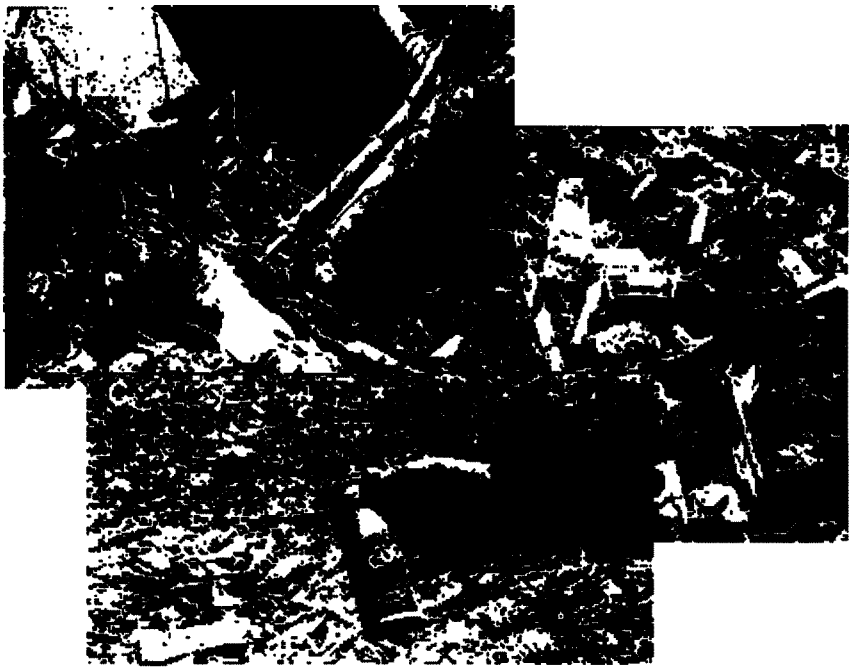

Figure 1. Example observations from the Chef Menteur landfill. A. Septic stormwater/leachate seeping beneath the landfill face, B. Batteries on the landfill surface, and C. Can of spray developing fluid

Unfortunately, these observations do not allow calculations of the potential for effects of HHW on the quality of surface or groundwater impacted by these releases. "Scale-up" calculations require more formal, statistically valid, waste characterization studies. These studies do not exist from either the USCOE or LDEQ despite the relative ease in performing them. They would inform both the facility operator and regulatory agencies what type of HHW is making it through the screening process, allowing for scale-up of potential impacts. At a minimum, they would inform regulators on what types of analytical methods and technologies should be applied to leachate management.

2.2 Recommendations: Because of the potential for HHW contamination of surface and groundwater, a monitoring and mitigation program should be established. This would include:

- Regulatory officials should immediately establish the efficiency of their HHW collection processes by performing formal, statistically valid, waste characterization studies. These studies should characterize the types and amount of HHW entering debris landfills in enough detail to understand specifically what categories, mass and characteristics of material are making it through the screening process.

- An important element of that study should include the direct analysis of leachate from both landfills. Only by direct analysis of leachate can the community assess what HHW sources have entered the landfill and have the potential to contaminate the surrounding groundwater and surface water.

- Once data are obtained, refinements to the HHW diversion process, groundwater monitoring plan or discharge monitoring permit can be performed if needed, to protect the community. Waiting blindly for environmental impacts years into the future is a lesson of the past that should not be repeated here.

- Volatile organic compounds, semivolatile organic compounds and heavy metals should be monitored in contaminated stormwater leaving these facilities and in the groundwater beneath these facilities. At present, these are not routinely measured, even though it is clear that HHW sources containing these priority pollutants are entering the landfill.

- Landfills should meet all applicable standards for volatile and semivolatile organics and metals discharge applied to other

facilities. This may require treatment of contaminated stormwater onsite or offsite.

- Dilution or flow augmentation should not be used as a "treatment" approach for leachate or stormwater. Chef Menteur discharges contaminated storm water in a lagoon filled with rainwater. This clearly provides dilution of the contaminated stormwater or leachate with a huge volume of cleaner water.

3.0 Wallboard and potential for H_2S generation

3.1 **Emerging problem:** One of the characteristic wastes of the Katrina debris stream is flood-damaged "sheetrock" or wallboard. Large volumes of wallboard were observed on the landfill face at Chef Menteur on 5/22/2006. This is not surprising due to the large percentage of wallboard in C&D waste and the widespread gutting of homes in the region. Normally, wallboard represents between 5 and 15% of the total C&D waste stream in the US, a total of 14 million tons per year (Sandler, 2003). A larger percentage of wallboard may be present in hurricane debris since interior gutting of homes represents a larger proportion of debris, particularly in the early phases of recovery. To that end, the Hurricane Katrina and Rita events may represent one of the largest volumes of gypsum wallboard being disposed of in landfills in the shortest period of time. Because the Old Gentilly landfill has handled such a large proportion of the house gutting debris, most of the wallboard has been disposed here.

This component of the waste stream poses a particular concern. Wallboard is composed of a gypsum core ($CaSO_4 \cdot 2H_2O$) covered with paper. Within C&D landfills, the wallboard comes into contact with rainwater which solubilizes the sulfate present in the gypsum core. Bacteria, in the presence of a carbon source (i.e., paper, glue, etc.) will generate reduced sulfur gases such as hydrogen sulfide (H_2S) via an anaerobic conversion process. These gases not only cause odors but, at higher concentrations, are toxic and linked with serious health issues from chronic and acute exposure (Table 2). The potential for hydrogen sulfide production is a known problem in the C&D landfill industry (O'Connell, 2005; Lee et al., 2006) and is driving an array of changes in the management of C&D waste. The presence of these gases is not only significant as a "nuisance" for nearby residents. In 2003, the ATSDR released a urgent health advisory for the area around one C&D landfill in Warren Township, Ohio (http://atsdr1.atsdr.cdc.gov:8080/NEWS/warrenoh120803.html). At this location, concentrations of H_2S were high enough to cause immediate human health concerns. Ambient air concentrations explained a number of health problems the residences were

Table 2. Current hydrogen sulfide standards

Concentration, ppb	Exposure period	Standard	Agency
2	Lifetime	USEPA RfC[1]	USEPA
20	14-365 days	ATSDR Intermediate MRL[2]	ATSDR
100	1 hour	AIHA ERPG-1[3]	AIHA
200	14 days	ATSDR Acute MRL[4]	ATSDR
10,000	10 minutes	NIOSH 10 minute ceiling[5]	NIOSH
30,000	1 hour	AIHA ERPG-2[6]	AIHA

[1] US Environmental Protection Agency Reference Concentration

[2] Agency for Toxic Substances and Disease Registry (ATSDR) Intermediate minimal risk level (protective of public health, even sensitive populations)

[3] American Industrial Hygiene Association Emergency Response Planning Guideline (Level that all individuals could be exposed for up to 1 hour without experiencing or developing effects other than mild transient health effects or without perceiving a clearly defined objectionable odor)

[4] Agency for Toxic Substances and Disease Registry (ATSDR) acute minimal risk level (protective of public health, even sensitive populations)

[5] National institute for Occupational Safety ad Health (NIOSH) recommended exposure limit

[6] American Industrial Hygiene Association Emergency Response Planning Guideline (Level that all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair an individual's ability to take protective action)

experiencing. This landfill was closed and remedial costs of 3-4 millions dollars were incurred to make the area safe again around the facility (details on EPA's removal response can be found at http://www.epaosc.net/site_profile.asp?site_id=1622). Odors exist at a number of C&D landfills from reduced sulfur gases and numerous states are considering rule making that would divert wallboard from these sites.

At the both the Old Gentilly and Chef Menteur site, conditions are ideal for generation of these gases. High volumes of gypsum wallboard are present and rainfall in the area exceeds 60 inches per year. Much of the wallboard has been broken into smaller preces through transport and demolition activities. This "dusting" of the wallboard increases its surface area and, therefore, its vulnerability to microbial attack. A wide variety of carbon sources are in the landfill including the paper facing of the wallboard itself and other components of the Katrina debris stream (cardboard, paper, vegetation, etc.). Sulfate-reducing bacteria are ubiquitous and high temperatures in the region will also encourage more rapid bacterial growth and gas generation. It is hard to imagine more ideal conditions for H_2S generation than the hurricane debris landfills in New Orleans East.

Over time, both the Chef Menteur and Old Gentilly have a strong potential to become significant H_2S sources in the community. The time frame of the problem is difficult to predict but it may present itself quicker than other landfills due to the rapid disposal rate at these locations. At Old Gentilly, H_2S is already present at high concentrations (maximum of 200 ppm[1]) in landfill gas from the prior disposal of municipal waste at this location. Siting these landfills in the same area of town of course can exacerbate the problem depending on wind speed and direction. Installing and operating H_2S recovery systems is extremely costly and may not be technically feasible at these landfills after they have been filled.

3.2 **Recommendations**: Because of the great potential for H_2S generation from hurricane debris, a monitoring and mitigation program should be initiated. A program should have the following elements:

- Immediately explore methods and procedures to divert wallboard from the current debris landfills. This should include reexamining segregation opportunities and diversion of large wallboard loads to landfills with gas collection systems.
- Monitoring of H_2S and other reduced sulfur gases in the communities adjacent to landfills in New Orleans East

[1] H_2S concentration at VP-3, maximum concentration at site, EE&G Restoration, 2005

- Educating residents and landfill workers about the health effects of H_2S
- Investigate the effectiveness of organic cover materials (i.e., compost) on H_2S emissions from hurricane debris landfills. Organic cover has the potential to oxidize reduced sulfur gases, much like a "biofilter"
- During the rebuilding phase, establish a significant recycling program for wallboard scrap, diverting further gypsum based materials from C&D landfills

3.0 CCA treated lumber

3.1 **Emerging problem:** An emerging issue within the landfill C&D industry is the leaching of arsenic and chromate from wood treated with chromated copper arsenate (CCA) as a preservative (Solo-Gabrielle et al., 2005; Khan et al., 2006a, 2006b). Recent studies have identified potential leaching rates of arsenic from treated lumber in C&D landfills that are very worrisome (Khan et al., 2006b) and a number of C&D landfills in Florida have come out of compliance with respect to arsenic in groundwater beneath these unlined facilities. This has led to significant efforts to divert CCA wood from C&D facilities in Florida. Many facilities refuse large loads of treated wood and instead send them to Class 1 municipal landfills for disposal. Despite the impending residential ban on CCA-treated lumber, there is significant concern that arsenic may be a legacy issue for C&D landfills and the environment around them. The average leachate concentration for arsenic in Ohio C&D landfills, for example, is 206 µg/L,well above applicable standards (Harris, D., 2005).

Treated lumber appears to be a significant component of Hurricane Katrina debris headed to landfills in New Orleans East. Decks, fences and other exterior wooden structures would be primarily treated lumber. Post-Katrina, the definition of C&D debris was changed to include treated and painted lumber, so no regulatory restriction exists currently. As these materials are placed within the landfill, rainfall events will leach arsenic from the treated lumber which can enter surface water via the contaminated stormwater discharge permit or enter groundwater through the base of the landfill. To my knowledge, no attempts are being made to divert treated lumber from C&D type landfills for hurricane debris. Therefore, the leaching issue for arsenic is now an issue facing New Orleans East, requiring a monitoring, and, if necessary, mitigation strategy for the area.

3.2 **Recommendations**: Because of the potential for arsenic concentrations in hurricane debris leachate, a monitoring and mitigation program should be initiated:

- During the ongoing rebuilding stage, treated lumber should be identified in a sorting/staging facility and diverted to a municipal landfill
- Arsenic should be monitored in contaminated stormwater and groundwater at C&D facilities handling hurricane debris. At present, it is not listed among the analytes on the standard C&D permit issued to the facilities

- Landfills should meet all applicable standards for arsenic discharge applied to other facilities. This may require treatment of contaminated stormwater offsite.

- Dilution or flow augmentation should not be used as a "treatment" approach for leachate or stormwater

4.0 Summary and Overall Recommendations:

This paper has identified three important environmental issues facing the landfills (and communities) of New Orleans East: the deposition of household hazardous waste in unlined landfills, the hydrogen sulfide gas problem from deposition of gypsum wallboard and the leaching of arsenic from treated lumber. All of these issues have the potential to create legacy sites for the city of New Orleans, State of Louisiana, and the nation much like the Agriculture Street Landfill, a CERCLA ("Superfund") site that resulted, at least partially, from depositing hurricane debris from Hurricane Betsy, a storm which impacted New Orleans in 1965 The potential environmental problems described in this white paper are not new and have been widely discussed and debated within the C&D industry and scientific community over the past 20 years.

Summary recommendations for these landfills are given below:

i. ***Continually evaluate opportunities to stage, sort, divert and recycle***. The argument that staging, sorting and recycling would delay reconstruction has never been supported with an engineering analysis that has been released to the public. A major opportunity to recycle and divert materials is being missed. The appropriate agencies should continue to examine efforts to reduce the flow of debris to landfills such as those described here.

ii. ***DEQ, EPA and the US Army Corps of Engineers should perform waste characterization studies that inform both current and future debris disposal plans***. An important opportunity to quantify the components of hurricane debris is being missed. Waste characterization studies are relatively

easy to perform and require diverting, classifying, identifying and weighing a statistically derived subsample of materials in the debris stream at various stages of recovery. From the hazardous material perspective, it would allow regulators and stakeholders to understand, from a quantitative perspective, what is making its way into the landfill and the neighborhood. Clearly, studies would identify opportunities for better efficiencies in diverting hazardous materials, markets for recyclables and if nothing else, how to do this better, cheaper and more protective the next time around.

iii. ***Sample, sample, sample.*** Analysis to understand the exposure pathways for residents and the environment from landfill toxics should be conducted regularly with input from the community and their experts. The initial attempt at this at Chef Menteur (discussed at http://www.deq.louisiana.gov/portal/) was not a serious effort to answer the questions posed in this report. For example, water was sampled at the detention pond only, not the leachate, itself. At this point leachate would have been seriously diluted with rainwater. Air samples for H_2S had a detection limit over 400 ppb, well above many of the health standards cited above. A more serious effort is needed to answer these questions than the one attempted previously.

References

EE&G Restoration, LLC. 2005. Limited-scope Phase 1 and Baseline Phase 2 Environmental Site Assessment for proposed Hurricane Katrina Construction and Demolition Landfill formerly Gentilly Landfill. 71 pp.

Harris, D. 2005. Preliminary evaluation of leachate analytical results from Ohio C&DD landfills. Ohio EPA Interoffice memorandum (available at http://www.theoec.org/pdfs/hottopics/hottopics_pr_cddanalysis.pdf

Khan, B.I., Solo-Gabriele, H.M., Townsend, T.G. and Cai, Yong C. 2006. Release of Arsenic to the Environment from CCA-Treated Wood. 1. Leaching and Speciation during Service Environ. Sci. Technol.; 40(3) pp 988 – 993.

Khan, B.I., Jambeck, J., Solo-Gabriele, H.M., Townsend, T.G. and Cai, Yong C. 2006. Release of Arsenic to the Environment from CCA-Treated Wood. 2. Leaching and Speciation during Disposal. Environ. Sci. Technol.; 40(3) pp 994 - 999;

Lee, S., Xu, Q., Booth, M., Townsend, T.G , Chadik, P., Bitton, G. 2006. Reduced sulfur compounds in gas from construction and demolition debris landfills. *Waste Management* 26:526-533.

O'Connell, 2005. Passing the smell test. Waste Age. April 1, 2005.

Sandler, K. 2003. Analyzing What's Recyclable in C&D Debris, BioCycle, Vol. 44, Iss. 11; pg. 51.

Solo-Gabriele, H , Jacobs, G., Dubey, B., and Townsend, T.. 2005. Warning Signs. certain chemical preservatives are unwelcome contaminants in the mulch and wood fuel markets. Construction & Demolition Recycling, September/October: 24-32

Attachment 3:

Quantities Of Arsenic-Treated Wood In Demolition Debris Generated By Hurricane Katrina

by Brajesh Dubey, Helena M. Solo-Gabriele and Timothy G. Townsend

Quantities of Arsenic-Treated Wood in Demolition Debris Generated by Hurricane Katrina

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The disaster debris from Hurricane Katrina is one of the largest in terms of volume and economic loss in American history. One of the major components of the demolition debris is wood waste of which a significant proportion is treated with preservatives, including preservatives containing arsenic. As a result of the large scale destruction of treated wood structures such as electrical poles, fences, decks, and homes a considerable amount of treated wood and consequently arsenic will be disposed as disaster debris. In this study an effort was made to estimate the quantity of arsenic disposed through demolition debris generated in the Louisiana and Mississippi area through Hurricane Katrina. Of the 72 million cubic meters of disaster debris generated, roughly 12 million cubic meters were in the form of construction and demolition wood resulting in an estimated 1740 metric tons of arsenic disposed. Management of disaster debris should consider the relatively large quantities of arsenic associated with pressure-treated wood.

Introduction

The total disaster debris produced from Hurricane Katrina in the two hardest hit states, Mississippi and Louisiana, was estimated at 72 million cubic meters (*1*, *2*). Disaster debris is composed primarily of construction and demolition (C&D) debris (50%) and vegetative wood waste (30%) (*3*). C&D debris consists of materials used in construction including concrete, roofing materials, drywall, and wood. Vegetative wood waste consists primarily of shrubs, tree branches, and tree trunks. Because of its nature, vegetative waste does not contain wood preservatives. However, wood used for construction is frequently treated to protect the wood from fungi and termite attack. The most common wood treatment preservative manufactured in the United States through 2003 is chromated copper arsenate (CCA) (*4*). Since 2003, non-arsenical copper-based wood preservatives, such as alkaline copper quat (ACQ) and copper boron azole (CBA), have been primarily used for the residential market. The typical concentrations of arsenic, chromium, and copper in CCA-treated wood used for residential applications are 1800–2800 mg/kg, 1900–3100 mg/kg, and 1200–1800 mg/kg, respectively (*5*). Typical concentrations of copper in ACQ and CBA treated wood are 3500–4500 mg/kg and 2500–3500 mg/kg, respectively (*5*). As a result of these high levels of metals, the C&D portion of disaster debris can be potentially contaminated with metals. Among the metals contained in wood preservatives, arsenic is of primary concern because of its high human toxicity (*6*).

CCA-treated wood has been commonly observed in C&D waste, as documented through studies conducted in Florida (*7*–*9*). Within the wood waste component of C&D, the fraction of CCA-treated wood has been observed to vary from 8 to 22%. Research evaluating technologies for separating treated wood (particularly CCA) from other wood products has been conducted in an effort to remove arsenic contamination due to inadvertent inclusion of CCA-treated wood within mixed C&D debris at recycling facilities. Technologies available for rapid identification and quantification include near-infrared (NIR) spectroscopy, laser-induced breakdown spectroscopy (LIBS), and X-ray fluorescence spectroscopy (XRF) (*8*, *10*, *11*). Recently, handheld XRF units have been used for research to document their utility to further augment sorting and quantification of metals within treated wood (*9*). Such technology, because of portability and provision of rapid results, is ideal for evaluating the potential contamination of disaster debris with wood based preservatives.

The objectives of the present study were to evaluate wood waste generated by hurricane debris for the presence of arsenical-based preservatives (i.e., CCA) and to use these results to estimate the potential extent of arsenic associated with disaster debris. Handheld XRF units were used for this evaluation. Results from the study are useful for establishing policy concerning the management of wood waste after major disasters.

Methods and Materials

Site Selection for Study. Measurements were taken during March 2006 within disaster debris from the New Orleans area. The wood waste portion of the disaster debris was evaluated at seven different sites (Figure 1). Sites included areas with extreme damage characterized by complete collapses of homes and areas where the damage was primarily due to flooding. Among the area with major damage, four sites were selected: two each at Upper Ninth Ward (Sites W1 and W2) and Lower Ninth Ward (Sites W3 and W4). The other three sites (Sites W5 through W7) were located in the inner area of the city where damage was mostly due to flooding.

Measurement of Chemical Treatment within Wood Waste. A total of 225 dimensional lumbers were evaluated using an XRF-analyzer (Innov-X model α-2000S) with at least 24 dimensional lumbers evaluated at each site. The number of lumbers included in the study from a particular site was based upon the apparent volume of wood pile at that particular location, with larger piles resulting in a greater number of analyses. The selection of dimensional lumber for analysis was conducted in a uniform manner with wood pieces tested from different parts of the wood waste pile. Conversion of the XRF readings to As concentrations was based upon a calibration curve between the XRF results and As measurements using traditional atomic absorption analysis for the particular instrument used in this study (*12*; see Supporting Information for more details.)

Calculation of Amount of Arsenic Associated with Treated Wood Waste. The quantity of arsenic associated with demolition debris was computed as the product of the total amount of wood waste (33% of demolition debris (*3*)), the

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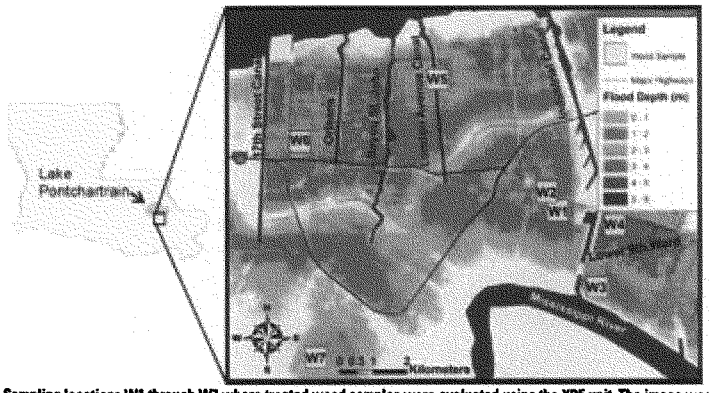

FIGURE 1. Sampling locations W1 through W7 where treated wood samples were evaluated using the XRF unit. The image was developed using the GPS coordinate recorded during the sampling event. Background image showing inundation depths was provided by Dean Whitman of Florida International University and Tim Dixon of the University of Miami.

TABLE 1. Statistics for Treated Wood Samples from Each Site (From a Total of 7 Sites) Including Range of Arsenic Concentrations Observed

sampling sites	number of lumbers tested	number positive for arsenic treatment	% CCA by number of lumbers tested positive for arsenic	range of arsenic concentrations (mg/kg)	number positive for copper only treatments	% other Cu treated wood by numbers of lumbers tested positive for copper only	number negative for arsenic and copper treatment
1	24	4	17	778–2170	5	21	15
2	28	10	36	199–3370	4	14	14
3	26	6	23	118–1430	0	0	20
4	54	10	18	890–4900	3	6	41
5	40	14	35	75–3500	10	25	16
6	27	1	4	248	1	4	25
7	26	7	27	284–2560	0	0	19
total	225	52	23.1	75–4900	23	10.2	150

fraction of wood samples that tested positive for arsenic treatment, and the geometric mean arsenic concentration. The geometric mean of the arsenic concentration was used because the data were found to be log-normal distributed (see Figure 3).

Results and Discussion

Statistics of Treated Wood Sample from Each Site. Overall, 52 dimensional lumbers were determined to have been treated with an arsenical preservative among the 225 samples evaluated at the seven sites (Table 1) or roughly 23% on a piece-by-piece basis. For individual sites the fraction that was treated with CCA varied from 4% for Site 6 to 36% for Site 2. This observation correlated with previous research conducted in Florida (8–22% CCA in C&D waste; 7–9). The As concentration in the samples testing positive for arsenic ranged from 75 to 4900 mg/kg. The large range of variation of the As concentration from different treated wood lumber could be attributed to several factors including the initial degree of treatment for that particular piece, impregnation, fixation procedure, the extent of weathering, and the natural properties of the wood which impact chemical retention. Furthermore, the average concentration from each site was variable (Figure 2) ranging from 248 mg/kg for Site 6 to 2690 mg/kg for Site 4. Of note was that a significant proportion of the wood evaluated contained non-arsenical copper-based preservatives (10.2%) and this was noted in the waste piles characterized by newer construction.

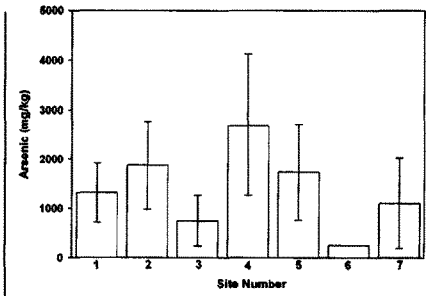

FIGURE 2. Average arsenic concentrations from the samples tested as CCA at seven sites (The error bar represents the standard deviation for the sample set for that particular site. For site-6, only one sample tested positive for CCA, hence no error bar is shown for this site).

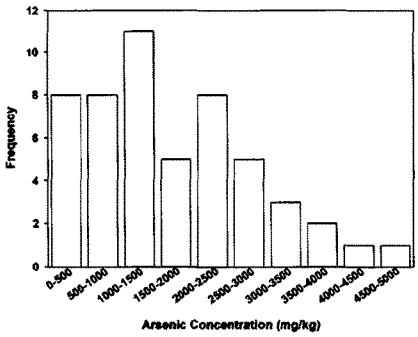

FIGURE 3. Frequency plot for arsenic concentration ranges in lumbers testing positive for arsenic treatment at the seven sites evaluated.

Amount of Arsenic in Disaster Debris. The frequency distribution of As concentrations from the sample set was found to be log-normally distributed (Figure 3). The geometric mean of the arsenic concentration in the treated wood samples was found to be 1240 mg/kg. With 50% of the disaster debris as construction and demolition waste of which 33% is wood waste and 23% of the wood waste being CCA-treated wood as per the field data, the total amount of As disposed in the environment in the form of disaster debris in the two states of Louisiana and Mississippi is estimated to be 1740 metric tons. In order to better visualize the magnitude, this quantity was scaled against soil and water relative to the surface area of the Mississippi and Louisiana states and the volume of water of Lake Pontchartrain, respectively. Using these scaling computations, the 1740 metric tons of arsenic was computed to be capable of increasing the concentration of a soil volume equivalent to the upper 1 in. of these two states' land by almost 0.17 mg/kg; it is capable of increasing the concentration of a volume of water equivalent to Lake Pontchartrain by 280 μg/L (28 times the drinking water limit of 10 μg/L).

Implication for Wood Waste Management after Disaster. Construction and demolition waste from the Hurricane Katrina disaster is currently being disposed in unlined C&D landfills. This disposal practice should be re-evaluated with respect to the potential for leaching of arsenic from pressure-treated wood (*13–16*) and in light of studies which suggest that such leaching can potentially impact groundwater quality (*17–18*). The need to consider the potential for arsenic leaching from disposed treated wood is further emphasized by the recent reduction of the drinking water limit from 50 μg/L to 10 μg/L (*19*). Although the focus of the current study was on quantifying arsenic, of note is that copper and chromium contained in pressure-treated wood can also be of concern due to the toxicity of copper to aquatic organisms (*20–22*) and the potential for chromium conversion to a more toxic form as Cr (VI) under certain environmental conditions (*23*). Future studies should focus on quantifying the Cr and Cu contributions in addition to As.

Given the large quantities of treated wood disposed during natural disasters, such as in the aftermath of Hurricane Katrina, disaster debris management plans should encourage communities to segregate treated wood for better management of wood waste as a whole. Although measuring every piece of wood is not practical in large scale disasters such as those which occurred in 2005 in the New Orleans area and Gulf Coast Region, those responsible for disaster debris management should consider the potential for arsenic contamination from treated wood as they make decisions concerning ultimate disposal.

Acknowledgments

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Supporting Information Available

Calculation details and debris photographs. This material is available free of charge via the Internet at http://pubs.acs.org.

Literature Cited

(1) Mississippi Department of Environmental Quality (MDEQ) website. http://deq.state.ms.us/Mdeq.nsf/page/Main_Home?OpenDocument; accessed during August 2006.
(2) Louisiana Department of Environmental Quality (LDEQ) website. http://www.deq.louisiana.gov/portal/; accessed during August 2006.
(3) Reinhart, D.; McCreanor, P. *Disaster debris management – planning tools*; Final Report submitted to U.S. Environmental Protection Agency Region IV, September 1999.
(4) Solo-Gabriele, H.; Townsend, T. Disposal practices and management alternatives for CCA-treated wood waste. *Waste Manage. Res.* **1999**, *17*, 378–389.
(5) AWPA. *American Wood Preservers' Association Book of Standards*; American Wood-Preservers' Association: Selma, AL, 2003.
(6) Shibata T. Dislodgeable arsenic from in-service CCA-treated wood. In *Environmental Impacts of Treated Wood*; Townsend, T., Solo-Gabriele, H., Eds.; CRC Press, Boca Raton, FL, 2006; pp 237–256.
(7) Tolaymat, T.; Townsend, T.; Solo-Gabriele, H. Chromated copper arsenate treated wood in recovered wood. *Environ. Eng. Sci.* **2000**, *7* (1), 19–28.
(8) Solo-Gabriele, H.; Townsend, T.; Hahn, D.; Moskal, T.; Hosein, N.; Jambeck, J.; Jacobi, G. Evaluation of XRF and LIBS technologies for on-line sorting of CCA-treated wood waste. *Waste Manage.* **2004**, *24*, 413–424.
(9) Jacobi, G.; Solo-Gabriele, H.; Townsend, T.; Dubey, B. Evaluation of Methods for Sorting CCA-treated Wood. *Waste Manage.*, in press. doi:10.1016/j.wasman.2006.09.014.
(10) Homan, W.; Miltz, H. *Evaluation of Rapid Methods for Detecting Wood Preservatives in Waste Wood*; IRG/WP 94-50024; International Research Group on Wood Preservation: Stockholm, Sweden, 1994.
(11) Peylo, A.; Peek, R. Rapid *Analytical Methods for Wood Waste – An Overview*; IRG/WP 98-50104; International Research Group on Wood Preservation: Stockholm, Sweden, 1998.
(12) Block, C.; Shibata, T.; Solo-Gabriele, H.; Townsend, T. Use of Handheld X-ray Fluorescence Spectrometry Units for Identification of Arsenic in Treated Wood. *Environ. Pollut.*, in press. doi:10.1016/j.envpol.2006.11.013.
(13) Jambeck, J.; Townsend, T.; Solo-Gabriele, H. Leaching of chromated copper arsenate (CCA)-treated wood in a simulated monofill and its potential impacts to landfill leachate. *J. Hazard. Mater.* **2006**, *A135*, 21–31.
(14) Townsend, T.; Dubey, B.; Tolaymat, T.; Solo-Gabriele, H. Preservative leaching from weathered CCA-treated wood. *J. Environ. Manage.* **2005**, *75* (2), 105–113.
(15) Townsend, T.; Tolaymat, T.; Solo-Gabriele, H.; Dubey, B.; Stook, K.; Wadanambi, L. Leaching of CCA treated wood: implications for waste disposal. *J. Hazard. Mater.* **2004**, *B114*, 75–91.
(16) Dubey, B.; Townsend, T.; Solo-Gabriele, H. Metal leaching from pressure treated wood in sanitary landfill leachate. In *Proceedings 2004*; IRG/WP 04-50220; Stockholm, Sweden, 2004.
(17) Dubey, B. Comparison of environmental impacts of wood treated with chromated copper arsenate (CCA) and three As-free preservatives. Ph.D. Dissertation, University of Florida, Gainesville, FL, 2005.

(18) Jambeck, J. The disposal of CCA-treated wood in simulated landfills: potential impacts. Ph.D. Dissertation, University of Florida, Gainesville, FL, 2004.

(19) National primary drinking water regulations; arsenic and clarifications to compliance and new source contaminants monitoring. *Fed. Regist.* **2001**, *66* (194), 50961–50963.

(20) Weis, P.; Weis, J. Accumulation of metals in consumers associated with chromated copper arsenate-treated wood panels. *Mar. Environ. Res.* **1999**, *48*, 73–81.

(21) Stook, K.; Tolaymat, T.; Ward, M.; Dubey, B.; Townsend, T.; Solo-Gabriele, H.; Bitton, G. Relative Leaching and Aquatic Toxicity of Pressure-Treated Wood Products Using Batch Leaching Tests. *Environ. Sci. Technol.* **2005**, *39*, 155–163.

(22) Stook, K.; Dubey, B.; Ward, M.; Townsend, T.; Bitton, G.; Solo-Gabriele, H. An Evaluation of the Heavy Metal Toxicity of Pressure Treated Wood Leachates with MetPLATE. *Bull. Environ. Contam. Toxicol.* **2004**, *73* (6), 987–994.

(23) Song, J.; Dubey, B.; Jang, Y.; Townsend, T.; Solo-Gabriele, H. Implication of Chromium Speciation on Disposal of Discarded CCA-Treated Wood. *J. Hazard. Mater.* **2006**, *B128*, 280–288.

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Senator BOXER. Thank you. I want to thank the panel. I'm going to start off right now with 3 minutes and I'm going to be tough on this because we need to move along.

Dr. McDaniel, the EPA says right here that they are doing everything they can to stop illegal dumping. They have testified to that. I asked them: Are you doing everything? Yes, I am. And yet in your testimony you identified an urgent need for Federal help with physical security, apparently including armed Federal agents to help your staff stop illegal dumping, especially at night. Please tell us why that's needed, and have you directly asked for that kind of help from the EPA or other Federal authorities and what has their response been?

Mr. MCDANIEL. I agree with a lot of the statements that have been made about illegal dumping. It has virtually exploded in the aftermath of the storms.

Senator BOXER. I'm more interested in EPA because that's what we have jurisdiction over.

Mr. MCDANIEL. Okay.

Senator BOXER. Have they done everything they can in your estimation to stop it. That's what they testified to and that's what they believe. Are they correct in making that statement?

Mr. MCDANIEL. I think they are with the exception we have asked for security assistance. And I understand they feel that that is not within their purview. We do have—we have launched an issue. We are working with local officials and sheriff associations and EPA has provided us with both equipment and additional resources to help in oversight.

Senator BOXER. Okay. So you don't have any requests from them at this time?

Mr. MCDANIEL. No.

Senator BOXER. Okay. That's very good.

And my last question. I think, Reverend, I don't have any questions for you because you were so eloquent and you made the case so beautifully I thought.

So I guess I would say to Ms. Subra, you have recommended that the waste of the Gentilly and the Industrial Pipe landfill should be isolated and the Chef Menteur landfill should be clean closed. Do you believe EPA—I get from your testimony you believe EPA should take the lead on that; am I correct on this? You believe this is a Federal responsibility and in terms of who would pay for it, do you feel it's a Federal responsibility?

Ms. SUBRA. I do think it's an EPA responsibility, because such a large portion of that waste stream was hazardous waste which EPA has the primary jurisdiction over. And by the Department of Environmental Quality allowing all those wastes to be blended and then appropriately, in their mind, disposed of in the landfill, they have created basically a hazardous waste landfill. And because the landfill waste is hydraulically connected to the surface water and the groundwater, if it's not removed and clean closed, it's going to serve as a source of contamination for generations to come.

Senator BOXER. I hear you. So what I get from this panel, then, is that EPA is doing everything to your satisfaction in terms of helping you police illegal dumping, but they are not doing enough to really clean close this particular facility. Thank you.

Senator Vitter.

Senator VITTER. Thank you, Madame Chair. First of all, illegal dumping. It has exploded. It is not being controlled in any meaningful way and I would reurge all the folks involved to find a solution that does something about that. Here is just one picture of an illegal dump, active operation, right next to wetlands. I mean, you can see what is occurring.

Second issue, Chef Menteur landfill. There are no operations there now. I think that's progress, but I do think there needs to be testing and possible clean closure. I believe EPA at some point offered to pay for the testing, but as I understand it, that's never occurred. I would urge us to move forward with that toward appropriate clean closure.

Third, I wanted to focus my questions on the old Gentilly landfill.

Mr. McDaniel, as I understand it, that site was allowed to get material under an emergency order of LDEQ that waived certain normal rules or normal requirements; is that correct?

Mr. MCDANIEL. That's correct. It had gone through the permitting process. It had been granted a permit, but the order to commence had not—was actually waiting on completion of a few details and we opened the site because of the need after the hurricane.

Senator VITTER. So one of the things it essentially waived is the fact that some of the site hasn't been capped. Another thing that is essentially waived is that there aren't berms, as I understand it, on two sides of the site. And another thing that the emergency order did is it expanded the normal definition of C&D to include things outside what would normally be considered C&D, like asbestos-containing material. Is anything I said incorrect?

Mr. MCDANIEL. Let me expand on the asbestos-containing material. We have in all cases handled asbestos-containing material, regulated asbestos-containing material as such and it has gone to NESHAP compliant landfills. Type one and two, the non-regulated asbestos material and non-friable can go to other C&D landfills, and that's a common practice. In fact, it's one of the safest disposal methods for asbestos.

Senator VITTER. But is the not correct that your emergency orders expanded the normal definition of C&D material?

Mr. MCDANIEL. To the extent it backed it up to the Federal definitions of C&D material.

Senator VITTER. So it did expand your normal definition?

Mr. MCDANIEL. Our State definition.

Senator VITTER. Okay. There are lined landfills in the area which could take all of this and not be out of capacity; isn't that correct?

Mr. MCDANIEL. There is in that immediate vicinity one lined landfill.

Senator VITTER. And it has the capacity to take it?

Mr. MCDANIEL. Long-term capacity, it has.

Senator VITTER. So what is the basic rationale for cutting corners at old Gentilly when there are other lined alternatives?

Mr. MCDANIEL. I would argue we cut no corners at Gentilly. The issue——

Senator VITTER. Again, just——

Mr. MCDANIEL. Let me explain.

Senator VITTER. Sure.

Mr. MCDANIEL. The issue is not capacity. It never has been. It's rate of processing. It's cleaning up, getting the material out of the reach of public—public safety issues and cleaning up so that we can get on to recovery. And that has been something that we have worked very diligently on.

Senator VITTER. If you didn't cut corners at Gentilly, why did you have to issue an emergency order that changed some of the rules?

Mr. MCDANIEL. To accommodate the amount and kinds and complexity of materials that we had to deal with. At no time did we make any decisions, and they are all very transparent. They were done in collaboration with scientists of both our agency, EPA, working with the Corps, and they are all documented in decisional documents. And the facts are stubborn things and you are welcome to look and see what those decision are based on.

Senator VITTER. Well, I have. I guess it's semantics. When I say, "cut corners," I include emergency orders which waive normal requirements.

Final set of questions, because I honestly think this gets to the heart of the matter. Aren't there legal requirements in State law that require people who come to you for a permit to disclose all of the operators and all of the owners of the site?

Mr. MCDANIEL. That's correct.

Senator VITTER. Wasn't that requirement ignored, not complied with at old Gentilly as evidenced by records that were recently disclosed in a Federal criminal investigation?

Mr. MCDANIEL. That information was unavailable to us until it became available just recently. I think we are still dealing with a little bit of news and not so much facts on that. We have taken comments on it. Our legal folks are looking at it and it will be done appropriately, I will assure you.

Senator VITTER. Mr. McDaniel, I don't think this is disputed. There were hidden partners in that operation. They are now disclosed. They weren't disclosed to you when you gave out the permit. They are now disclosed. One of them is going to jail for a similar contractual deal, not this, but something else. The other is an unindicted co-conspirator in that other contractual deal.

Now that you know that, now that you know they broke the law in not disclosing closing themselves to you, what are you going to do about it?

Mr. MCDANIEL. Well, we will have to accommodate that in our decision making on the permit.

Senator VITTER. Does that mean you're going to revoke——

Mr. MCDANIEL. If they broke the law they will not get the permit.

Senator VITTER. Does that mean——

Mr. MCDANIEL. That needs to be established, sir.

Senator VITTER. Well, read today's paper. They admit it.

Mr. MCDANIEL. I have to work with a little more than that, sir.

Senator VITTER. Well, they admit it themselves so I suggest that——

Mr. MCDANIEL. Well, there were other sides too, but I understand and I hope you understand, we are not going to do anything illegal.

Senator VITTER. Let me just end by saying if, in fact, what I laid out is correct and they broke the law with this nondisclosure, I believe the only appropriate remedy is to revoke the permit, not to fix the paperwork and move on.

Mr. MCDANIEL. I can't argue that, but I would want the advice of my legal staff.

Senator BOXER. Senator, I was happy to give you an additional two minutes. You went an additional three minutes. My democrats have said that they would give their time to Senator Landrieu, so they are not going to question.

So, Senator Landrieu, you have 3 minutes plus the 3 minutes to match what Senator Vitter took, so go for it.

Senator LANDRIEU. The line of questioning has been very good on all sides because it is a very significant issue.

Let me start with Father Vien. Thank you for your leadership and for the leadership of all the community groups that are very concerned like communities everywhere about what is happening in the neighborhoods? What is this debris? Where is it going? Are there contamination? And thank you.

Secondly, I will most certainly support your call for an integrated task force that would push us to do a better job as a State as testified itself on coming to terms with some of these issues, so I thank you for that very good proposal and I will support that as well as IGs, investigative generals to look into the situation, because I do think getting to the bottom of this is very, very important.

But No. 2, I would make the point, again, the tons of material that had to be moved out of all neighborhoods and communities so that the rebuilding could begin was a paramount issue, and obviously, from what you, Mr. McDaniel, have testified, there were lots of procedures that had not been worked out, lots of problems. Would you just testify to the one or two major issues that you would recommend this committee look at for the disposal of waste, which goes from things that are not hazardous at all to things that are very hazardous in a catastrophe like this region suffered. Just one or two things for the record that we could look at and help solve this problem.

Mr. MCDANIEL. Thank you, Senator Landrieu. The first would be, I think, reconciling the authority, FEMA and EPA, who has the primary responsibility for making decisions on environmental issues. That has to be confusing. It diverted a lot of your attention and took us off our mission.

Secondly, would be it took 6 months to iron out the asbestos protocol with the EPA. We need to have memorialized a lot of the decisions that have been made that are good decisions, collaboratively agreed upon, and put them in some kind of——I call it a playbook, you can call it guidance, but something so that the next time this happens people will know how to deal with CCA treated wood, what asbestos materials go where, what can be burned, what can't be burned, what is the proper way to dispose of certain materials. Look at——we had six different interventions where we looked to remove prohibited materials from these C&D landfills. I think it's a good process.

Senator LANDRIEU. And you are testifying that that protocol, to the best of your knowledge, was not worked out at the Federal and State level prior to Katrina or Rita?

Mr. MCDANIEL. Senator, we have never been confronted with that kind of disaster in the past. It was just a lot of new ground that had to be covered and it just took time. And it's not that any one was reticent or slow. It just took time to work through those issues.

Senator LANDRIEU. That's one of the reasons that it's important for this committee to be here.

Father Vien, the proposal that you have made that is in your testimony that you spoke about today, have you gotten that generally approved by the State and the City, as well as Jefferson Parish? Because if the landfills are closed in Orleans, the waste is going to have to go to Jefferson Parish or to the landfills around the City. Has Jefferson Parish agreed to this plan and has Orleans Parish, generally the City Council, the Mayor and the Governor, do they support what you are proposing? Or have given you any indication that they may be supportive?

Mr. NGYUEN. Senator, it's going to be an uphill battle for us, but from the citizens' level in Jefferson because I remember, they called me up and said: You don't want your trash, we don't want your trash. So I went over and met with the leaders of two civic associations. And actually what we need to look at, and I hope this committee could begin it, is the overall regional way of handling, managing this that would include recycling, reduce, reuse. So if there's a place where there is a landfill, then all of that should take place before.

Senator LANDRIEU. But right now do you have approval from Jefferson Parish that if we close the landfills in Orleans that they would take the waste in Jefferson?

Mr. NGYUEN. Not officially, no.

Senator LANDRIEU. Not officially. Okay. Mr. McDaniel, would you just speak about what some of your recommendations might be on the recycling side? I only have a minute left. Because there is a tremendous amount of interest from both the Republican and Democratic Party about the fact that we really missed an opportunity here to really go green, to recycle, to really step up the box here. And I know you have been so tied down with just the regular processing, but could you just testify one or two things that have come across your desk that we might focus on in the future? Because I think we could all make some progress in that area.

Mr. MCDANIEL. Senator, I will agree that I think we need to pay more attention to recycling, but I would also like the record to show, and it is in our written record, this was one of the largest recycling jobs that has ever been undertaken. A hundred percent of the wood waste was converted to mulch used for cover, for fuel, a million refrigerators, 956,000 E goods, four million orphan containers, quarter of a million small engines. We are processing hundreds of thousands of vehicles right now that are being remediated and sent for recycling. So there was a huge amount of recycling, 26 million pounds of hazardous waste has been taken out of the waste stream and disposed of properly.

Senator ISAKSON. One State.

Mr. MCDANIEL. So a lot was learned and I hope that will be shared with the future in this playbook as well.

Senator LANDRIEU. Thank you.

Senator BOXER. Senator Isakson, I understand you have one question.

Senator ISAKSON. Not even a question, just respecting the Chairman's request. I would like for to you follow up on your request at the beginning of your testimony. You probably more than anybody in this country could write an evaluation plan to help all of us as to what you do in a catastrophe of this type and I'd personally appreciate it if you'd submit to the committee your recommendation and your advice, because obviously, that would be critical to learn from the mistakes and the smart decisions that were made in the aftermath of Katrina.

Mr. MCDANIEL. Thank you, sir. I would be delighted to do that.

Senator BOXER. Senator, I think that's an excellent idea. We want to thank the panel very much for your very clear testimony. We will follow up on this issue. And Panel 3, Sidney Coffee, Chair of the Louisiana Coastal Protection and Restoration Authority; Dr. Robert Twilley, Director and Wetland Biogeochemistry Professor at the Department of Oceanography and Coastal Science at Louisiana State University; Randy Roach, Mayor of Lake Charles, Louisiana; Thomas Jackson, President, Southeast Louisiana Flood Protection Authority-East.

And I'm going to ask our witnesses if they can try to go 4 minutes. The reason I'm pushing the time is we need to clear out of this room. And so, we have very wonderful hosts but they do need to have their real estate back. So we're going to have to go quickly. And then I'm going to ask all of us non-Louisianians to just take a minute of questions, including myself, and we will give 3 minutes to the Senators from Louisiana and that should keep us moving on time.

So if there is no disagreement, I will start from this corner and move across, if that's all right with everybody.

Ms. Coffee, Chair of the Louisiana Coastal Protection and Restoration Authority. Thank you.

STATEMENT OF SIDNEY COFFEE, CHAIR, LOUISIANA COASTAL PROTECTION & RESTORATION AUTHORITY

Ms. COFFEE. Thank you, Chairman Boxer and members of the committee. I appreciate the opportunity to speak before you today.

Our future obviously is inextricably linked to the unique landscape of our coast, both nationally and here in our State. It's not only ecologically world significant but it's critically important to the energy and economic security of this nation. And it's vanishing. Even before the hurricanes we were losing more than 24 square miles a year of our coastline. In the two days of Katrina and Rita alone, we lost 217 square miles. That's hard for me to grasp and I deal with it all the time. That's an incredible amount of land to be lost.

Our coast may represent a unique crisis right now, but it's a harbinger of what is to come for the rest of America's coastline, vulnerable to extreme storms and the effects of global climate change and sea level rise. Louisiana is taking aggressive action and the good

news is we do have a plan. The State has a plan. And it's going to be finished in about six weeks.

After the hurricanes, the two hurricanes, Katrina and Rita, our legislature did establish the CPRA, Coastal Protection and Restoration Authority, and for the first time in our State's history, we now speak with one voice on the integration of coastal restoration and hurricane protection. Our primary mission is to develop, implement and enforce a comprehensive coastal protection and restoration master plan and to give oversight to the levee districts in south Louisiana.

While our plan will be finalized this spring, our partnership with the Corps is very critical and it remains fundamental to our success. In late 2002, at the same time that CPRA directed us to create a master plan, the Congress directed the Corps to do the same, to develop and present a full range of coastal restoration and hurricane protection measures exclusive of normal Corps policy. The law directed the Corps to conduct this analysis in close coordination with the State. The Corps' plan is due to Congress at the end of this year and that schedule, from what we understand, has already slipped about 6 months.

Our two teams, though, are working very closely together on the technical issues, but we remain concerned that the Corps will be more influenced by top down policy rather than relying solely on sound science and engineering because it's happened before. So we feel it's very essential that Congress consider the State's plan as well as the Corps' plan.

The credibility of our plan is key. We have worked hard to establish a very high level of national scientific review and public participation, and our goal is to provide a comprehensive, credible and honest approach to restoration and protection here in Louisiana. We seek to balance four objectives: Sustain the ecosystem, restore sustainability to the ecosystem, reduce the risk to economic assets, maintain a diverse array of fish and wildlife habitat, and sustain Louisiana's heritage and culture. The master plan acknowledges that tough choices must be made in how we live and work in south Louisiana.

Our plan also includes early urgent actions: Close Mississippi River Gulf Outlet, reconnect the lower Mississippi River to its delta, restore our barrier islands and shorelines, modify existing water resource projects so we can better achieve our goals, and advance the projects that protect strategic assets in concentrated populations. Adaptive management is fundamental to this plan. It allows us to build vital projects now, but continue to plan and design the more ambitious components.

We estimate the State's plan will cost tens of billions of dollars over several decades and we are committed to see that through. As you know, we passed overwhelmingly a constitutional amendment that dedicates any and all Federal offshore revenues to this purpose and this purpose alone. And the State has already dedicated a portion of its proceeds from the tobacco lawsuit settlement, could mean 300 million in one-time money this year.

Senator BOXER. Could you sum up at this point?

Ms. COFFEE. Yes. We are up against tremendous challenges in circumstance, scale and urgency. We ask that we work with Con-

gress, that you work with us, to find more creative and programmatic approaches so that an average project will not take 25 years from beginning to end.

Senator BOXER. I'm going to have to stop you at that point. Thank you.

[The prepared statement of Mr. Coffee follows:]

SIDNEY COFFEE, CHAIR, LOUISIANA COASTAL PROTECTION & RESTORATION AUTHORITY

Chairman Boxer and Members of the Committee, thank you for holding this hearing in Louisiana and giving me the opportunity to testify before you today. I would like to give special thanks to Senator Landrieu and Senator Vitter and to our entire Louisiana Congressional Delegation. They have led our state through some very difficult times since the fall of 2005.

My name is Sidney Coffee. I serve as the Chairman of the Coastal Protection and Restoration Authority of Louisiana. On behalf of the authority, I am pleased to share with you both the urgent challenges we face and the comprehensive plan we have underway to create a sustainable and safe coastal Louisiana.

It has taken thousands of years for the Mississippi River to create the seventh largest river delta on earth and we call that delta America's WETLAND. More than forty percent of our nation drains into this massive river system and through Louisiana to the Gulf of Mexico. The river's course, both past and present, is inextricably linked to the destiny of our people and the future of our state and nation.

Coastal Louisiana is not only ecologically significant for the world, but is a place of critical importance for the energy and economic security of the United States. It is also one of the few places in our nation where the people remain tied to the land economically, emotionally and spiritually, through a culture and heritage as unique as any you will find on the planet.

What happens on Louisiana's coast is vital to the United States. Almost ninety percent of the nation's offshore oil and gas comes from offshore Louisiana. A third of all the oil and gas consumed in our country is produced or transported through Louisiana, connecting to nearly half of America's crude oil refining capacity. South Louisiana's port system is first in the world in tonnage. We are second only to Alaska in annual volume of domestic seafood landings, serve as the nursery ground for marine life in the Gulf of Mexico and as habitat for the second largest migratory bird flyway in North America.

This incredible, organic, coastal landscape protects these national assets, as well as the two-million people who live in coastal Louisiana, many who serve as the support for national energy production, fisheries and navigation. But we are losing this vital part of America's coast. Even before the hurricanes of 2005, we were losing more than 24 square miles of our coast every year. In the 2 days of Katrina and Rita, we lost 217 square miles.

In great measure, this ongoing land loss crisis can be attributed to the unintended consequences of Federal actions. The construction of levees along the Mississippi River for navigation and flood control cut the wetlands off from the fresh water and sediment of the river's annual overflow. Oil and gas canals and navigation channels, dredged to support the nation's domestic energy production and distribution, have exacerbated salt water intrusion and accelerated wetland degradation.

Unless we harness the significant resources of the Mississippi River more wisely in the future, the ecology and economy of coastal Louisiana will collapse. If we do not adopt a more integrated and comprehensive approach to ecosystem management at the Federal level, our nation will suffer as well.

Louisiana's coast is in a constant state of emergency. It represents a unique crisis now, but is a harbinger of what is to come for the rest of our nation's coastal areas which are all vulnerable to unavoidable, extreme storms and the effects of global climate change and sea level rise. More than forty-two percent of the Nation's population live in coastal areas and these will be challenges that many people face.

How we carry out coastal restoration and hurricane protection here in Louisiana will influence all of our rebuilding activities, from insurance and business development to personal decisions on where and how to rebuild. It should also be a model for the nation.

Louisiana has taken aggressive action. In the wake of hurricanes Katrina and Rita, the state legislature established the Coastal Protection and Restoration Authority. For the first time in our State's history, this single state authority is integrating coastal restoration and hurricane protection and is speaking with one voice

for the future of Louisiana's coast. The CPRA's primary mission is to develop, implement and enforce a comprehensive coastal protection and restoration master plan, which includes oversight of the levee districts of south Louisiana. We must also ensure the consistency of the Federal and State water resource programs in which state participates, such as the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA), the Coastal Impact Assistance Program (CIAP) authorized by the Energy Policy Act of 2005, and the work authorized by the Water Resources Development Act.

While Louisiana's Comprehensive Master Plan for a Sustainable Coast will be finalized and submitted to the Louisiana Legislature for approval in April, our partnership with the Corps will remain fundamental for our success. In the third supplemental appropriations bill, which became law (P.L. 109-148) on December 30, 2005, the Congress directed the Corps to conduct a comprehensive hurricane protection analysis and, at full Federal expense, design, develop and present a full range of flood control, coastal restoration, and hurricane protection measures exclusive of normal policy considerations. The law further directed the Corps to conduct this analysis in close coordination with the State of Louisiana and its appropriate agencies.

Our State team and the Corps team are working closely together on technical issues, but the State remains concerned that the Corps will be more influenced by top-down policy rather than relying solely on sound science and engineering. This has happened before, most recently in 2004 when the Corps was directed to pare down a comprehensive coastal restoration program to fit a $2 billion price tag and a ten year implementation window. Therefore, it is essential that the Congress consider the State's plan as well as the congressionally mandated protection plan for south Louisiana that it is expecting to receive from the Corps.

This Committee should have confidence that the State of Louisiana has worked diligently to ensure the highest level of credibility in the creation of this plan. An open planning process, involving nearly 50 stakeholder meetings and 9 public meetings to date, with 4 public meetings being held this week, has provided the public and stakeholders every opportunity to participate meaningfully in the process. Through ongoing national and international scientific review, the CPRA has strived to provide State and federal decision makers, as well as the public, with a comprehensive, credible and honest approach to coastal restoration and protection in Louisiana.

The State's master plan seeks to balance four objectives: to restore sustainability to the coastal ecosystem; to reduce risk to economic assets; to maintain a diverse array of habitats for fish and wildlife; and to sustain Louisiana's unique heritage and culture. The Master Plan acknowledges that tough choices must be made in how we live and work in coastal Louisiana, and relies on an aggressive program of ecosystem restoration; non-structural measures such as comprehensive land-use planning, elevating homes and businesses, and fully-implementing emergency evacuation procedures; and substantially improved hurricane protection projects—levees—to sustain the way of life that has become so important to the people of Louisiana and the rest of the nation.

Our plan will also include urgent early actions that must move on a faster track: closure of Mississippi River Gulf Outlet canal; reconnecting the lower Mississippi River to its delta plain; restoring barrier islands and shorelines; modifying existing water resources projects to better achieve our objectives; and advancing projects that protect strategic assets and concentrated population areas.

We estimate the Master Plan will cost tens of billions of dollars over several decades. Last September, 82 percent of Louisiana voters approved a constitutional amendment to dedicate all Federal offshore oil and gas revenues shared with the State for the purposes of coastal restoration and protection. In addition, the State dedicated a portion of its proceeds from the tobacco lawsuit settlement, which could mean a one time deposit of more than $300 million for coastal protection and restoration.

Adaptive management is a cornerstone of our approach. This will allow us to build vital projects as we continue to plan and design the more ambitious components of the Master Plan—similar to the approach taken in building the interstate highway system and the Mississippi River and Tributaries Project. We are also committed to building science and engineering capacity in Louisiana to guide the design and construction of projects, as well as to resolve uncertainties. Louisiana can lead the way for others as we literally re-write the textbooks in coastal engineering.

Louisiana's effort is not comparable to traditional water resource development efforts. The ecosystem restoration and hurricane protection challenges we face are unique in circumstance, scale and urgency. We don't have time for business as usual. To achieve our objectives, we must have a strong commitment from Congress

to find more creative approaches to large scale ecosystem restoration efforts, with an expedited process for designing and building projects. It is our only chance in this race against time and against the forces of nature to save these national assets.

As a State, we are faced with tough decisions and trade-offs. Change is inevitable whether we take action or not. Everyone will be affected, so everyone has a stake in working toward a balanced outcome. We are faced with the hard decisions of prioritizing the components of the plan. We suggest that national priorities must be set as well; that a process that takes an average of 25 years to move a single project from planning to completion must be expedited. Areas such as coastal Louisiana that benefit and impact the Nation so profoundly should be treated in a manner that considers the unique circumstances they face and the urgency they demand.

We are at an historic crossroad—one that presents us with a stark choice: make bold and difficult decisions that will preserve this State's future and the national assets hosted here or cling to the status quo and allow coastal Louisiana to vanish. We in Louisiana have chosen to address this challenge aggressively, and we offer you our expertise in this area, our creativity and our determination to help resolve the challenges we face together. Thank you so much for your time today.

Senator BOXER. Dr. Twilley.

STATEMENT OF ROBERT TWILLEY, DIRECTOR AND WETLAND BIOGEOCHEMISTRY PROFESSOR, DEPARTMENT OF OCEANOGRAPHY AND COASTAL SCIENCE, LOUISIANA STATE UNIVERSITY

Mr. TWILLEY. Thank you very much. As most of the committee knows, water is probably one of the most important resources that will define the economic, public health and environmental issues in the next century, certainly by 2050. The Committee on Environment and Public Works should not only consider issues associated with present or near-term water resource project portfolios, but must also look at a longer term prospective of how the nation will prioritize this finite resource to achieve a more sustainable future given the challenges of a changing climate. And this is particularly true for coastal resources that are becoming increasingly more vulnerable to risk requiring new approaches by providing community resiliency, by integrating both protection and restoration.

As an example, coastal Louisiana has long been a landscape of rich natural resources and extensive human settlements that have tried to manage the risk of occupying an extremely dynamic coastal environment. It is the eighth largest delta in the world. Over the last 100 years reducing the risk to human settlements and the economic infrastructure has been done at increased risk to ecological systems and natural resource capital. Public work projects for the public good with unintended consequences.

This is a working coast. Provides goods and services of tremendous national importance. At the same time we have natural resources that also provide goods and services of equal national significance, such as storm protection, fisheries, critical waterfowl habitat, and good water quality conditions. This certainly is a region where corporate sustainability is so codependent on environmental sustainability.

Science and engineering and public policy must resolve the following three questions in a cooperative manner: What is at stake? What processes will work? And what can be done to sustain economic and natural resources?

What is at stake? You know those statistics very well. Fisheries, navigation, commerce, those have been cited. What processes are at work? It's a river dominated delta. Without the river this delta will

not survive. It is a fact that the 6 million acres that we have we can we no longer sustain without the sediment and freshwater resources to empty into our wetland flood planes. It is very important that we provide critical resources to this delta to reduce the continued degradation of our landscape.

So what can be done? And I want to make one other quick point. You know, so many times the point is made related to people moving toward the coast. What I say a lot to people is that, it's the coast that's moving toward our communities and our economic infrastructure.

And so what can be done? And I want to lay this out in three points. First, planning. Planning has to include effective ecosystem restoration that will promote synergies with protection systems and limit conflict. This is a challenge. We are doing both restoration and protection. That means we are looking at structural infrastructure, structural features and non-structural features and how we engineer this landscape is going to set the trajectory for the future. The present river resources pass this city every day. It's not finding the resources. It's managing the resources we have. And that requires a comprehensive system level analysis of what we do with the river.

Senator BOXER. Sir, if you could tell us the next two things very quickly.

Mr. TWILLEY. I will. I've got two right here. No. 2 is urgency. We have to do this now. This is a critical system that if we do not act and we do not get large-scale projects moving presently it's going to become more costly and tougher to rebuild this delta.

Second and third, funding streams. We have to be very careful how you authorize funding streams because you end up with stove pipes, you end up with inability to do adaptive management and assessment, so the authorizations and the funding streams can't be recompeted every year. You have to have funding streams that complete the project.

STATEMENT OF ROBERT TWILLEY, DIRECTOR AND WETLAND BIOGEOCHEMISTRY PROFESSOR, DEPARTMENT OF OCEANOGRAPHY AND COASTAL SCIENCE, LOUISIANA STATE UNIVERSITY

Water is probably one of the most important resources that will define the economic, public health and environmental issues in the next century, certainly by 2050. Today, water resource quantity and quality across well-defined regional basins are largely defined by highly engineered landscapes linked to a changing global hydrologic cycle that will challenge our political will to provide for national priorities. Thus water resource planning through the development of public policy is arguably one of the most important features of our national security, sustainable natural resources, public health, and economic development. Ecosystem services derived from healthy natural resources support our national wealth, and our society will profit from policies that sustain the finite water resources of our continent, and our globe. Thus our national priorities and portfolio of water resource projects need to have a long-term perspective of providing for a safer, healthier and more sustainable society. And this is particularly true for our coastal resources that are inexplicably linked to our river basins.

The U.S. Army Corps of Engineers has evolved into one of the most important federal agencies affecting the characteristics of our national water resources system. Thus the policies and priorities within the USACE planning and authorization guidelines define our future water resources capacity. Based on the assumptions of the significance of this agency responsibilities to future water conditions, the Committee on Environment and Public Works should not only consider issues associated with present or near-term water resource project portfolios, but must also look at the longer-term perspective of how the nation will prioritize this finite resource to

achieve a more sustainable future giving the challenges of a changing climate. And these river resources must be factored into a priority system that properly accounts for the value that coastal resources provide our nation.

These fundamental principles of water resource planning and public work projects are very important to policies that address problems within coastal boundaries including: (1) wetland loss, (2) eutrophication (dead zones), and (3) coastal hazards. With 80 percent of the coastal land loss of the entire US, the largest seasonal hypoxic zone (nearly the size of New Jersey), and now two devastating hurricanes in a single month during 2005, the Gulf Coast is a harbinger of what coastal communities throughout the U.S. will face in the future. The issues and policies, by both federal and state entities, associated with rebuilding the Gulf Coast are those of national importance, which will require strong leadership in managing risks by more properly integrating engineering solutions with natural processes that more properly account for ecosystem goods and services—how do we build both structural and natural infrastructure in our coastal regions.

Coastal Louisiana has long been a landscape of rich natural resources and extensive human settlements that have tried to manage the risks of occupying an extremely dynamic coastal environment—the eight largest river delta in the world. Both environmental and social systems have tried to adapt to sea level, subsidence and hurricanes to accommodate sustainable development. Now the stakes are higher as we in Louisiana struggle with not only rebuilding our natural resources, America's Wetlands' of the Mississippi River delta, but also the social and business systems that have been devastated by two hurricanes, Katrina and Rita. So we are dealing with the challenge of promoting the resiliency of both natural and social systems by providing necessary natural and human resources. If restored properly, the Gulf Region will develop new paradigms as to how coastal communities deal with risks and hazards of the coastal zone. But we are developing this rebuilding process in a political environment of great urgency, which I advocate requires even greater commitment to a few fundamental principles of how to integrate protection and restoration of the ecological-social landscape within our coastal boundaries.

The loss of wetland resources in Louisiana has been occurring for over one hundred years, estimated at 1.2 million acres of coastal wetlands since the 1900's, and prior to Katrina was projected to lose another 300,000 acres by 2050. These wetlands relied on the distribution of water and sediment resources from the Mississippi River to keep the coastal landscape intact, to support a state known as sportsman paradise'. The underlying causes of losing America's Wetlands' include public work projects in navigation and flood control that reduced risks to social systems by controlling' river resources, fertile sediments and freshwater; causing them to be lost to the Gulf of Mexico rather than emptying into the deltaic floodplain. In addition, energy related industries built various canals and waterways through marsh landscapes that not only promoted access for oil and gas rigs, but also provided conduits for saltwater intrusion and storm surges. These artificial changes to the landscape to protect local communities and support a national economy worked against the coastal processes of the river delta causing risks to wetland vegetation. So while reducing the risks to human settlements and coastal infrastructure over the last 50 years has been very effective; it has been done at increased risks to ecosystems that rely upon river resources for survival.

The coastal wetland landscape has been degrading for nearly 100 years, while the entire social system and industrial infrastructure along the coast was devastated in a month by hurricanes Katrina and Rita. There is an urgency to promote the resiliency of economic infrastructure that will rebuild social systems and provide protection and jobs to

communities along the coast. This has to be done while we validate models and their

assumptions as to the proper combination of wetland resources and levee systems that are needed to secure and protect sustainable economic development. This validation process, with intense data collection and proper scientific review, will be instrumental in planning for risks in the future. This planning needs a science and engineering program that integrates the theories and practices of natural and social sciences to establish guidelines for engineering solutions that promote a sustainable and safe coastal landscape. This will require these three sciences (physical, social and engineering) to resolve the following three questions in a cooperative environment. What is at stake? What processes are at work? What can be done to sustain economic and natural resources? The continued isolation of these three issues by these three disciplines among existing institutions will amplify the continued increased risks of living in coastal communities of Louisiana and throughout the US. From now on, the public will demand accountability to the long-standing paradigm of public work projects with unintended consequences'.

So what is at stake if we do not properly rebuild both the social and natural capital of coastal Louisiana. More than 30 percent of the nation's fisheries catch comes from America's Wetland, and it provides one of the largest habitats in the world for migratory waterfowl. More than 25 percent of all the oil and gas used in the United States either originates from or passes through this working wetland, the distribution point for energy supplies to the entire eastern U.S. Louisiana's port system, including New Orleans, Port Fourchon, Baton Rouge, and related smaller ports connected by the Intracoastal Waterway, is the largest in the world, including greater tonnage that Rotterdam or Singapore, the next largest port systems. The coastal area currently provides a buffer from hurricane storm effects to approximately 2 million residents who live within the 19 coastal parishes (counties). Roughly half of the Louisiana coastal population resides outside of New Orleans and depends on the wetlands either directly or indirectly for employment in fisheries and the oil and gas industry.

So we cannot abandon either the economic or the natural resources of this region—this is a working coast that provides goods and services of tremendous national importance. At the same time, we have natural resources that also provide goods and services of equally national importance. The challenge is to find engineering solutions to risks and sustainability that consider the goods and services of both economic and natural resources of coastal regions.

So what are the processes at work in the Gulf coastal zone that can sustain a productive landscape (Boesch et al. 1994). Understanding the fundamental processes of the delta cycle is prerequisite to any policy that deals with geomorphic and ecologic features of this coastal system (Fig. 1). Transgressional sequences at the province and basin scales of coastal Louisiana govern smaller scale successional changes at the habitat scale of the marsh. The proximity of fluvial processes to marshes shift as distributaries of the Mississippi River migrate along the coast, changing the distribution of sediment, nutrients, and salt that control the type of habitat that colonizes the emergent zones of the basin. Thus there are continued changes not only from emergent to open water as part of the transgressional sequences, but the community composition of the emergent lands changes among fresh water, intermediate, brackish, and salt marsh vegetation (Fig. 2).

As fluvial processes decrease, there is a lack of fresh water discharge to control sea water encroachment, causing salt and brackish marshes to migrate landward, either replacing fresh water marshes or converting marshes to open water (Fig. 2). During active delta formation, such as observed in the Atchafalaya River basin, there is a migration of fresh water and intermediate vegetation toward the coast as salinity regimes decrease in the coastal zone. Processes at all three spatial scales including province, basin and habitat levels are coupled to produce a spatial mosaic of changes in wetland cover and composition that form very complex and dynamic patterns of coastal barrier system. The result of these processes across the Mississippi River Deltaic Plain is 6,177,610 acres (2,500,000 ha) of marshes that account for 60 percent of the coastal wetlands in the lower 48 states. These patterns of coastal processes have to be incorporated in any perspective of coastal restoration and rehabilitation.

The fundamental processes that the natural, social and engineering sciences will have to consider include a very dynamic landscape—which requires policies that promote adaptation rather than a philosophy of control. New Orleans, Louisiana's port and many coastal communities exist within a changing mosaic of barrier islands, salt marshes and freshwater swamps. Rebuilding after Katrina and Rita must address the ongoing and dynamic changes in this landscape—just as coastal restoration efforts did before these storms inflicted their damage, as described in our November 2004 LCA (Louisiana Coastal Area) report. For the last several thousand years, the land building or deltaic processes resulted in a net increase of more than 4 million acres of coastal wetlands, even with the occurrence of sea level rise, subsidence, and hurricanes.

Wetland loss is caused by soil accumulation insufficient to offset sinking of the land and rising sea levels. Human activities (canals, hydrologic modifications, failed reclamation, flood control measures) have caused wetland loss to accelerate; and prevented the natural processes to rebuild landscape features elsewhere along the coast. Without an aggressive ecosystem restoration effort, high rates of wetland loss will continue. The relative rise in sea level is an issue in coastal Louisiana; as it is in the Everglades, coastal Carolinas, Delmarva Peninsula, and New Jersey-New York coast. Given the high subsidence rates (land sinking) along with the seas rising, New Orleans is seeing now what many of these other coastal communities will see in about 4-5 decades. Given this condition, many proponents argue that we should give up on New Orleans. If that is the case, then we should also begin the systematic retreat of every coastal community in the U.S. Or we can reflect and

think about a better partnership with nature; rather than viewing these situations as some sort of war with nature. This river delta experienced sea level rise three times it present level nearly 5000 years ago; and still was able to build wetland landscape given ample river resources.

As for nearly all river deltas in the world, to give up on the landscape and cultural heritage of an ecosystem that has such potential for ecosystem resilience' is a major statement in our political will to rehabilitate natural resources in this country. It is a statement of our stewardship of natural resources without a fight to overcome business as usual. I have personally been involved in reconnecting sediment and freshwater resources from the Magdalena River in Colombia to a wetland floodplain consisting of

one the largest mangrove areas in the Caribbean Sea. Reconnecting these coastal processes, while maintaining several of the economic activities of the region, resulted in immediate and extensive response of wetland ecosystems. And in Louisiana, projects such as Caernarvon freshwater diversion, with the Caernarvon Interagency Advisory Committee, has effectively resolved conflict in ecosystem needs and stakeholder opportunities by developing ideas around the natural pulsing of this landscape. Again, finding solutions by managing natural processes to sustain wetland resources that consider stakeholder use of coastal systems. There are trade offs, and realities of consequences must be clearly stated. But business as usual can be corrected to include partnerships among natural, social and engineering sciences to build more sustainable systems in such dynamic coastal landscapes. But the challenges of a changing climate means that such trade offs must consider 50 and 100 year conditions of project landscapes, which will require even more river resources today to protect the future.

So what can be done to provide proper guidelines that balance the risks to social and natural resources to promote a more integrated restoration and protection of coastal resources along the Gulf coast (Fig. 3)? The key is to understand how to deal with uncertainty in such a dynamic landscape—and how that is factored into risk management. First, effective ecosystem restoration that will sustain coastal wetlands is to manage and use the natural resources that created the coastal area. The present waste of river resources each day is sufficient to mount a very aggressive, albeit energy intensive, campaign to artificially distribute sediments to recover some of the geomorphic features of this degrading landscape. This may take 5-10 years of aggressive use of long-distance conveyance of sediment slurries connected to present and proposed dredging activities. Then freshwater diversions, which are concrete structures in levees that allow river flow through gates to adjacent wetland floodplains, will sustain the landscape over longer several decades. These river resources are important to sustain wetland resources facing natural disturbances from relative rise in sea levels, storms, and subsidence. Along with rebuilding the deltaic floodplain, there must be an aggressive effort to restore shoreline protection and barrier islands. Many of these features will have to evaluate the negative effects of existing artificial features of the landscape, and think about reauthorizations and land-use practices that can provide opportunity of distributing water resources across the coast. Inventory of coastal barrier resources systems features, the coastal processes that sustain those features, and the free goods and services they provide are key elements of any restoration program.

The process of rebuilding coastal ecosystems as part of the social landscape will require new approaches to adaptive management strategies shared by natural, social and engineering sciences. And this new thinking will have to be adopted into our national priorities in public work projects. These strategies will have to deal with uncertainties, and establish methodologies to evaluate how services from both natural and social resources reduce risks to communities along the coast. There has to be conflict resolution in securing resources to support rebuilding the infrastructure of both ecosystems, urban, and industrial sectors of the coast. As restoration alternatives are developed to change the ecosystem and rebuild human settlements, system response must be monitored to incorporate learning as part of the process. We have to accept that not all the answers are

apparent in the initial investments in this joint enterprise of science and engineering, but there must be institutional commitment that financial resources will be held accountable to an adaptive management framework. It is the only way to deal with such uncertainties in a dynamic coastal setting. The only worst-case scenario is no action at all.

Large-scale ecosystem restoration programs must begin immediately, in concert with the urgency to rebuild the urban and industrial infrastructure following major disturbances. Many coastal wetland landscapes, such as Louisiana, are reaching critical points and will become technically more challenging and certainly more costly to rebuild unless actions to stabilize them occur immediately. Following major

disturbances, the rebuilding process has to look at opportunities that exist to improve protection of social systems—with stronger emphasis on how restoring natural resources can provide service to coastal communities. Coastal resources represent some of the most impacted and altered ecosystems worldwide and are sensitive to many hazards and risks, from floods to cyclones to disease epidemics (Adger et al. 2005, Science 309:1036-1039). Thus, management agencies need to explore linkages between ecosystems and human societies to help reduce vulnerability and enhance resiliency of these linked systems in coastal areas.

Footnote:

"Every phenomenon and apparent eccentricity of the river is controlled by law as immutable as the Creator, and the engineer need only to be insured that he does not ignore the existence of any of these laws, to feel positively certain of the results that he aims at."

"If the profession of an engineer were not based upon exact science, I might tremble for the result, in view of the immensity of the interest dependent on my success."

From James B. Eads, USACE, taken from The Control of Nature by John McPhee, 1989.

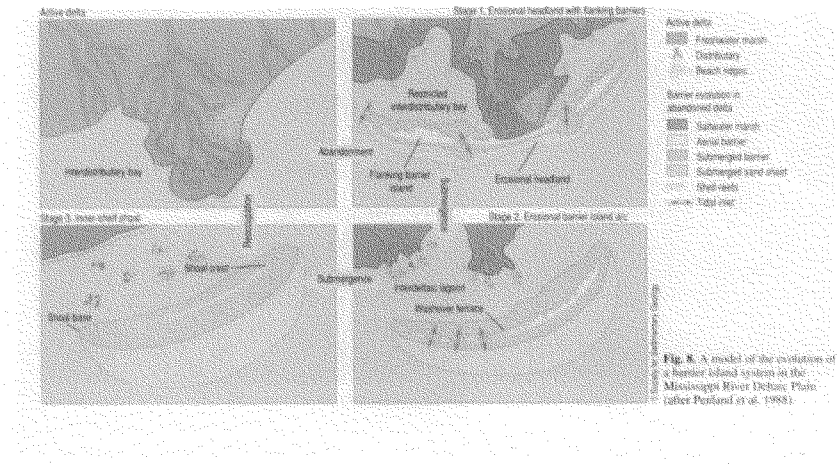

Figure 1. Model of the evolution of a barrier island system in the Mississippi River Deltaic Plain (Figure from Gosselink 1998; Original from Penland et al. 1988).

west by the natural levees of old distributaries and on the seaward edge by a barrier headland or island system. The interdistributary basin is

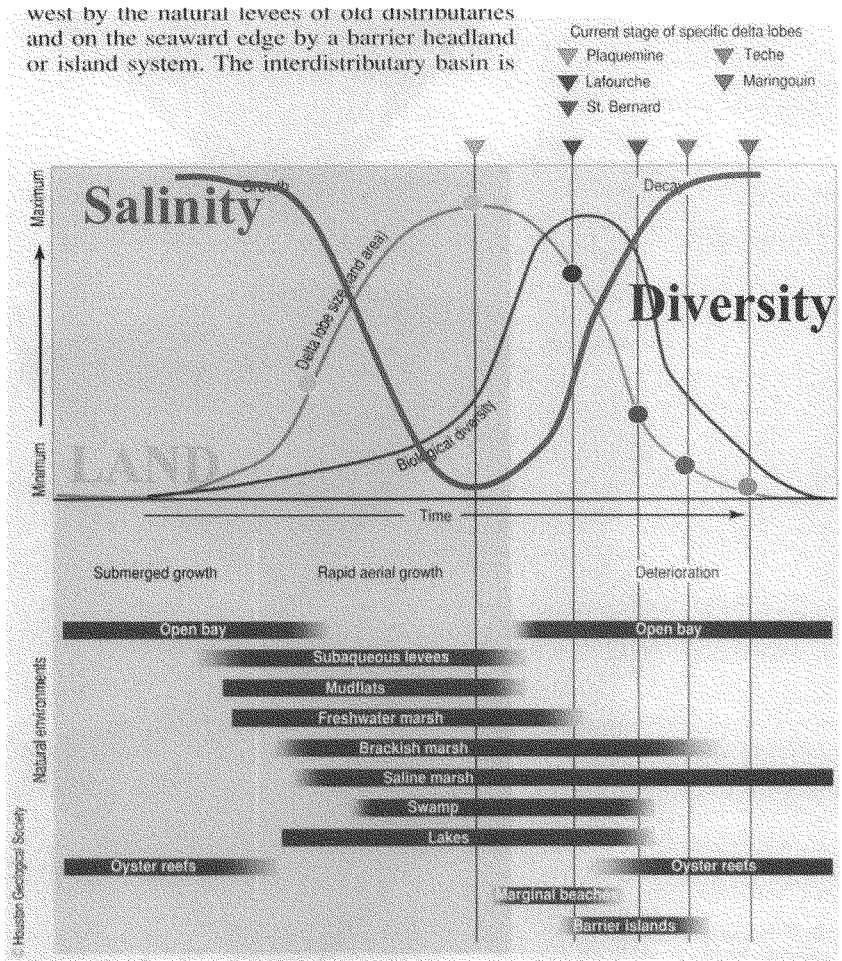

Fig. 18. Graphical depiction of the growth and decay of a delta lobe (adapted from Gagliano and Van Beek 1975; Neill and Deegan 1986). Habitat and biological diversity peak in the early to middle stage of the decay phase.

Figure 2. Conceptual model of the delta cycle depicting the growth and decay of a delta lobe (Figure from Gosselink 1998; modified from Gagliano and Van Beek 1975; Neill and Deegan 1986).

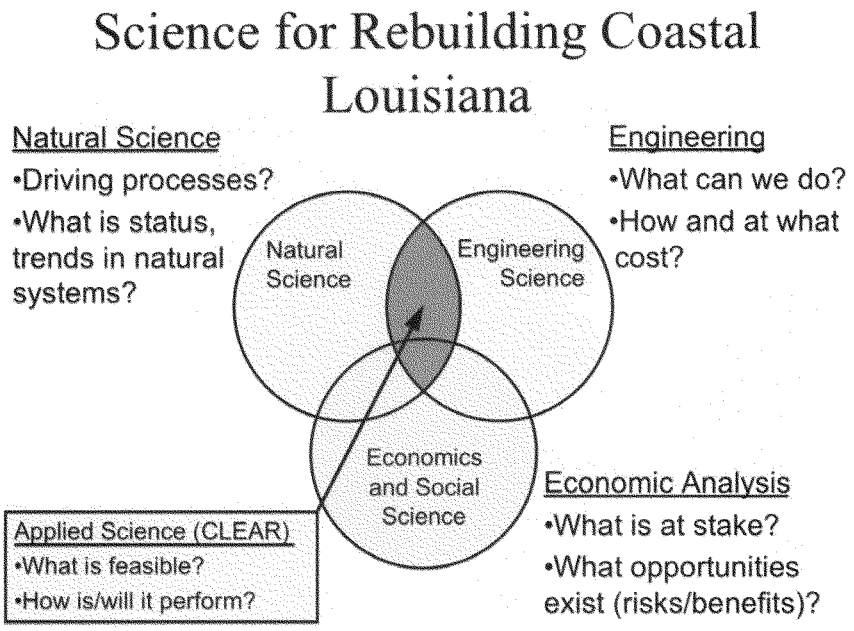

Fig. 3. Integration of the natural, social and engineering sciences to guide public work projects in coastal barrier resources systems such as coastal Louisiana. The Coastal Louisiana Ecosystem Assessment and Restoration (CLEAR) program (www.clear.lsu.edu) has developed some of the modules to accomplish this integrated framework.

Senator BOXER. That's perfect. Mayor, welcome.

STATEMENT OF RANDY ROACH, MAYOR, LAKE CHARLES, LA

Mr. ROACH. Thank you. Madame Chairman, I also want to add my words of welcome to the committee just as a small town mayor. I want you to know that your presence here in Louisiana is a great source of encouragement to all of us. Southwestern Louisiana is home to one of the most diverse wetlands in the United States. Within this area the Chenier Plain zone of Louisiana extends from Vermilion Bay to southwest Louisiana to Galveston Bay in southeast Texas. Because of the topography, including extensive marshes and cheniers, the Chenier Plain enjoys a unique diversity of animal and wildlife habitat. It is also habitat for one of the largest concentrations of neotropical birds along the entire Gulf Coast. This Gulf Coastal region is shared by Cameron Parish and Vermilion Parish. Cameron is home to four wildlife refuges, three Federal, one State. Immediately to the north of this area approximately 150,000 people live in or around the City of Lake Charles. The local economy is based on a major industrial complex consisting of two large oil refineries, one LNG terminal facilities and 22 petrochemical plants. The ship channel, which travels through the wetlands of Cameron Parish, has evolved into one of the most critically important energy corridors in the country. There are two LNG facilities planned along the ship channel. One is currently under construction. A fourth facility is currently being constructed in the lower Cameron Parish near the community of Johnson's Bayou. Once completed it is estimated that these facilities will supply up to 25 percent of our nation's natural gas.

If time permitted I could spend my allotted time describing to you the difficulties that we have had in getting Federal funding to adequately maintain the ship channel and the resulting concerns that this situation creates with regard to the viability and the security of this industrial complex. But we are here to talk primarily about wetland restoration.

The area of southwest Louisiana was hit hard by Hurricane Rita. The hardest hit area was Cameron Parish. The damage caused along our coast was catastrophic. The towns of Cameron, Holly Beach, Creole and Grand Chenier were practically obliterated by a 20-foot storm surge and many other Coastal communities were heavily damaged by high winds and flooding. Thousands of acres of marshlands were inundated by seawater killing livestock, ruining crops and doing indeterminate damage to the soil and the environment. Virtually the entire coast of Louisiana, including New Orleans, was affected by the storm surge of Hurricane Rita. It extended all the way to Lake Charles, 30 miles inland, just to the north of Cameron Parish. Some areas around the city were inundated by a surge of up to eight to ten feet.

Over the years we have had several successful wetland restoration and protection projects completed in our area, but these projects have been affected by the storm.

The Cameron-Creole Watershed Project is one of the largest hydrologic restoration areas along the entire Gulf Coast. Before Hurricane Rita it consisted of over 15 miles of protection levee and five

major state-of-the-art water control structures. It protected over 100,000 acres of incredibly diverse wetlands owned by private and public entities including the Sabine Wildlife Refuge. Unfortunately, the system has been damaged by the storm and we are still waiting for the system to be restored.

Other projects are also awaiting repair. They are projects that were funded by Federal and State dollars. All of these projects are being evaluated by FEMA for eligibility for assistance.

There are also several water control structures and levees on private lands that have been damaged, but these have been deemed ineligible by FEMA.

My purpose here today is not to blame any Federal agency, not FEMA or the people who work for FEMA. What I'm suggesting to you is that our problem is in part the result of well-intentioned Federal regulations which were not designed to deal with the variety, magnitude and combination of socio-economic and environmental problem created along the coast of Louisiana as a result of the hurricane season of 2005.

But I am here to tell you that as one person who has gone through this for the last 17 months that my presence here today is a commitment on the part of the State of Louisiana and other mayors and other individual local leaders to work with this Congress to solve it and have a sensible solution.

I think the playbook idea is great. We need to expand it beyond wetland restoration to all areas affecting hurricane recovery.

Senator BOXER. Thank you very much, Mr. Mayor.

[The prepared statement of Mr. Roach follows:]

STATEMENT OF RANDY ROACH, MAYOR, LAKE CHARLES, LA

Southwestern Louisiana is home to some of the most diverse wetlands in the United States. Within this area is the Chenier Plain zone of Louisiana, which extends from Vermilion Bay in Southwest Louisiana to Galveston Bay in Southeast Texas. Because of its topography, including extensive marshes and cheniers, the Chenier Plain enjoys a unique diversity of animal and wetland habitat. It is home to wintering waterfowl, multitudes of species of wildlife, freshwater fisheries and estuarine fisheries and is the stopover habitat for one of the largest concentrations of neotropical birds along the Gulf Coast.

This coastal region is shared by Cameron and Vermillion Parish. It is dotted by small communities where the main economic activity is fishing, shrimping, cattle farming and servicing the offshore oil industry. Marshlands extend 30 to 40 miles inland where farmers grow rice and sugar cane and ranchers raise horses and cattle.

Immediately to the north of this area, approximately 150,000 people live in or around the City of Lake Charles. The local economy is based on a major industrial complex consisting of two large oil refineries, one operating liquefied natural gas (LNG) terminal facility and 22 petrochemical plants. The Calcasieu Ship Channel, which travels through the wetlands of Cameron Parish, has evolved into one of the most critically important energy corridors in the country. There are two more LNG facilities planned along the ship channel—one is currently under construction. A fourth LNG facility is currently being constructed in lower Cameron Parish near the community of Johnson's Bayou.

In March of 2006, there were five LNG facilities operating in the United States. Southwest Louisiana will eventually have four such facilities within a 20 mile radius of each another. Once operational, it is estimated that these facilities will supply 25 percent of our nation's natural gas.

If time permitted I could spend my 5 minutes describing the difficulties we have had getting Federal funding to adequately maintain the ship channel and the resulting concerns this situation raises with regard to the viability and security of the industrial complex it supports, but we are here to talk primarily about wetland restoration.

The area of Southwest Louisiana hardest hit by Hurricane Rita was Cameron Parish. It is the largest parish in the State geographically but one of the smallest in terms of population. It is home to four wildlife refuges—three Federal and one State.

The damage caused by Hurricane Rita along the coast was catastrophic: the towns of Cameron, Holly Beach and Grand Chenier were practically obliterated by a 20-foot storm surge and many other coastal communities were heavily damaged by high winds and flooding. Thousands of acres of marshlands were inundated by sea water, killing livestock, ruining crops, and doing indeterminate damage to the soil and the environment.

The seafood industry was also affected. Sixty to eighty percent of the shrimp fleet was damaged, destroyed or displaced. Fishermen along the entire Louisiana coast have suffered from the one, two blow of Katrina and Rita.

Virtually the entire coast of Louisiana, including New Orleans, was affected by the storm surge of Hurricane Rita. It extended all the way to Lake Charles, 30 miles inland and just to the north of Cameron Parish. Some areas around the city were subjected to a surge of up to eight to ten feet.

Like other areas of the Gulf Coast, the hydrology of Southwestern Louisiana has been altered by man and these changes have contributed to the erosion of our coastal wetlands. Canals and deep water channels connected to Gulf of Mexico shipping lanes were dug to support oil exploration and to ship raw materials to petrochemical industries located in and adjacent to the coastal Chenier Plain.

Over the years, wetland restoration and protection measures have been implemented by large and small scale projects throughout Southwest Louisiana. The infrastructure consists of various size levees and water control structures ranging in size from small pipes to one-hundred-ten foot wide by one-thousand foot long navigation locks. Virtually all of these structures, whether owned by private entities, the State Government or Federal Government, were damaged by Hurricane Rita.

After the devastation of Hurricane Rita, the coastal wetlands suffered through an unprecedented drought. The combination of salt water from the storm surge and lack of rain resulted in salinities in freshwater marshes which were comparable to that of the Gulf of Mexico. These excessive salinities remained in the coastal marshes for a year after Hurricane Rita's landfall. Remnant areas still exist today. Salinity means salt. And salt destroys marshlands.

The Cameron-Creole Watershed Project is one of the largest hydrologic wetland restoration areas along the entire Gulf Coast. Before Rita, it consisted of over 15 miles of protection levee and five major State of the art water control structures. It protected over 100,000 acres of incredibly diverse wetlands owned by private and public entities including the Sabine National Wildlife Refuge.

Unfortunately, large sections of the levee system for this project were destroyed by Hurricane Rita re-exposing the restored wetlands to the ravages of salt water intrusion.

The Cameron-Creole repair project has been divided into three phases. The estimated cost to fix this system is approximately eight (8) million dollars. FEMA has yet to qualify this project under its guidelines. Because of the urgency of these repairs, the Coastal Wetland Planning, Protection and Restoration Task Force (CWPPRA) has agreed to fund phases one and two and is proceeding with the bid process.

Other projects constructed with State and Federal wetland funds were also seriously damaged by Rita and have not been repaired-the East Mud Lake Project, the East Sabine Lake Project, and the Humble Canal Project.

The Holly Beach Sand Nourishment Project also needs to be reworked. It protects Highway 82 which is the only barrier between the saline waters of the Gulf of Mexico and almost nine thousand acres of marsh along the southern boundary of Sabine National Wildlife Refuge (SNWR). Repairs to this public project are needed to restore the beaches.

All of these projects are still being evaluated as to eligibility by FEMA.

Water control structures and levees on private lands were also damaged by the hurricane. Many of the private landowners and small public entities (e.g. local drainage boards) that have applied for assistance through FEMA have been deemed ineligible.

I am not here to lay blame at the doorstep of any Federal agency. Not on FEMA or on the people who work for FEMA. The problem is our dependence on well-intentioned Federal regulations, which were not designed to deal with the variety, magnitude and combination of socio-economic and environmental problems created along the coast of Louisiana as a result of the hurricane season of 2005.

The residents of the City of Lake Charles and Calcasieu Parish depend on the coastal wetlands of Cameron Parish to support our local economy and protect us

from future hurricanes. The marshes of Southwest Louisiana are resilient and can be restored. If the coastal restoration projects outlined are funded and completed in the near future this would go a long way towards helping the restoration process. If these projects are delayed much longer, the wetlands in our area will mirror the devastation currently plaguing those in the southeast part of the State both in terms of urgency and severity.

We in Southwest Louisiana recognize the importance of the Morganza to the Gulf project and the people of Terrebonne and the need for levee elevation after years of settling in the LaRose to Golden Meadow project in Lafourche Parish. These matters are important and need to be addressed, just as the damage Hurricane Rita brought to Southwest Louisiana needs to be addressed.

The culture of coastal Louisiana is unique. Its survival depends upon the restoration of our vast, diverse wetland resources and associated productivity. The people who live there are strong and resilient. They will recover and prosper if they are supported- not restricted - by rules and regulations designed to get the work done quickly, ethically and at a reasonable cost.

The good news is that this is happening in a place called America, a country established by people of great vision; governed by the people and for the people. And you are among the leaders entrusted with the legacy of that vision. On behalf of Southwest Louisiana, I am here to commit to you that we will do our part to help resolve the pressing issues I have presented to you today.

Thank you for your time. We appreciate your efforts in trying to remedy the present dilemmas facing America's coastal wetlands of Louisiana.

Senator. BOXER. Mr. Jackson.

STATEMENT OF THOMAS L. JACKSON, PRESIDENT, SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY-EAST

Mr. JACKSON. Thank you, Madame Chairman. I appear before the committee today as the president of the newly formed Southeast Louisiana Flood Control—Flood Protection Authority-East. I am a registered professional engineer with a specialty certification in water resources engineering. I'm also a lifelong resident of New Orleans and Jefferson Parish, so I'm very familiar with the problems that we have had over the years with hurricane protection. My report to you today will focus on the current conditions of our hurricane protection system as we have analyzed it within the SLFPA-East.

Our authority is over the New Orleans, Orleans Levee Board, the East Jefferson Levee Board, I mean districts, and the Lake Borgne Levee District in St. Bernard Parish. I would like to address the hurricane protection system as it relates to the pre-Katrina authorized levels, i.e. those levels that were authorized back in the '60s by the Congress under the Lake Pontchartrain and Vicinity Hurricane Protection Plan and not necessarily the hundred-year plan that we have been talking about more today.

The Lake Borgne Levee District, which encompasses primarily St. Bernard Parish, had a disastrous impact during Hurricane Katrina. The Mississippi River Gulf Outlet levee was virtually destroyed by Hurricane Katrina. It has since been rebuilt by the Corps of Engineers to a height two feet above the pre-Katrina authorized levels. However, there has been no discussions relative to armoring this levee, which is very vulnerable to Lake Borgne and tidal surges, let alone overflows and erosion on the back side of the levee.

The St. Bernard Parish District is also responsible for the internal canals as well as pumping stations. The internal canals within St. Bernard Parish, as Senator Isakson stated recently, is clogged with sea grass that floated in, virtually floated in during the tidal

surge inundation of St. Bernard Parish. The sea grass ended up in homes and it ended up in the canal system. And the pumping operation through that canal system has been virtually impacted by breaking equipment, by clogging canals to flow, and we have been unable through our executive director to get the help we need. Other parishes have had subsurface drainage cleaned by FEMA and FEMA contractors, however St. Bernard is still struggling to get these major canals cleaned.

The lock projects of the locks in the MRGO levees are up to two feet below grade and need to be raised and need to be raised very quickly. The East Jefferson Levee District was less impacted by this storm as were the other two. They are still—the lakefront levees are up to 2 feet below grade. They are in the process of being raised at this time under Task Force Hope of the Corps of Engineers. The western divider flood wall between Jefferson Parish and St. Charles Parish is up two feet below grade. The Corps wants to raise this to 100-year event protection as opposed to raising it twice.

Orleans Parish, the lakefront levees all the way from Jefferson Parish all the way out to New Orleans East are again several feet below grade as well as the levee that turns south and comes back into the Intracoastal Canal. All of the structures on railroad crossings, highway crossings and other critical spots are as well below grade and need to be raised immediately. We have a hurricane season coming upon us very soon.

The Industrial Canal card is the most vulnerable. There is a lot of talk about closing the Mississippi River Gulf Outlet, the GIWW, however, these are long-term projects and this must be done immediately.

[The prepared statement of Mr. Jackson follows:]

STATEMENT OF THOMAS L. JACKSON, PRESIDENT, SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY-EAST

Good Morning Mr. Chairman, members of the Committee, my name is Thomas Jackson. Thank you for the opportunity to be here.

I appear before the committee today on behalf of the Southeast Louisiana Flood Protection Authority—East recently convened Board on January 10, 2007. At the first meeting of the new Authority East Board, I was elected President and have been serving in that capacity since. I am also Past National President of the American Society of Civil Engineers (ASCE) and have served for the past year and one half on the ASCE External Review Panel (ERP) providing external review of the Interagency Performance Evaluation Taskforce (IPET) investigation of the New Orleans area hurricane protection system performance during Hurricane Katrina. I am a registered Professional civil engineer in several Gulf States and a Diplomate with specialty certification in water resources engineering. I am recently retired from DMJM Harris as Senior Vice President and Chief Engineer of the firm. I might add parenthetically I am also a lifelong resident of New Orleans and Jefferson Parish so I am very familiar with this area and the problems in storm protection that we have had over the years.

My report to you today will focus on the current status of hurricane protection within the jurisdiction of the SLFPA—East, including the East Jefferson Levee District, the Orleans Levee District, and the Lake Borgne Basin Levee District.

My discussion will focus on the condition of our hurricane protection system with respect to the pre-Katrina authorized level of protection rather than the 100 year storm level of protection needed for the FEMA flood insurance program.

I will begin with the Lake Borgne Levee District which encompasses St. Bernard Parish. This District was severely impacted by Katrina with the virtual destruction of the Mississippi River Gulf Outlet (MRGO) levee. This levee has been rebuilt by Task Force Guardian to approximately 2 feet above pre-Katrina authorized levels

to account for subsidence of this newly built levee. However, no specifics have been given by the Corps regarding armoring this levee to protect it from wave action, or overtopping and erosion on the protected side.

The Bayou Dupre Control Structure on the MRGO levee must be raised approximately 2.5 feet to the pre-Katrina authorized elevation. This project is being analyzed by the Corps to determine the feasibility of implementing this interim fix or proceeding directly to the 100 year elevation.

Raising Highway 46 crossing and Bayou Road floodgate. The elevation of Highway 46 as it crosses the federal levee in Verret is about 3 feet below the pre-Katrina authorized elevation. The Floodgate and associated floodwalls are also too low.

The eight miles of the Verret to Caernarvon Levee must be raised to get it back up to pre-Katrina authorized elevation.

All of this work is supposed to be funded with the 3rd Supplemental Appropriation. It should be noted, however, that the Corps has informed the District that not enough money is left in this category of funds to complete these projects. As proposed by the President's 2008 budget, transfer of $1.3 billion to the west bank projects without additional funding, many of these east bank projects will go unfunded.

The Lake Borgne Basin Levee District is unusual in that the District has the responsibility for construction, operation and maintenance of the major canals and pumping system in St. Bernard Parish.

St. Bernard Parish was included in the Corps Pump Station Storm Proofing Project which has provided projects for the storm protection of pumping stations in Orleans and Jefferson parishes, but no work has been done in St. Bernard. We have been told that there were limitations on the total funds provided for this work and under the law the authorization and appropriations go hand in hand and when funds ran out so did the Corps authority to storm proof pumps. Additional funds and authorization will be required. These stations are very vulnerable and provide very little protection for the operators during a storm.

The drainage canals throughout St. Bernard Parish are clogged with swamp grass that floated into homes and drainage canals by hurricane Katrina. This grass is blocking drainage in the canals and breaking trash rakes and pumping equipment and needs to be removed as soon as possible. Continuous pleas from our Executive Director to the Corps and FEMA have gone unanswered on this issue.

The East Jefferson Levee District suffered the least damage from Hurricane Katrina of the three Districts under the SLFPA-E. However I-walls found to be of questionable stability are located as transitions on each side of the lakefront pumping stations, and have only been temporarily repaired. In addition, I-walls at the north-west corner of the District have only been temporarily shored with steel sheet piles.

The 10 mile lakefront levees in East Jefferson are 2 to 4 feet below pre-Katrina authorized grade and are in the process of being raised to the pre-Katrina authorized levels.

On the West Return Floodwall along the St. Charles/Jefferson Parish line from Armstrong Airport north to the Lakefront the I-wall sections of this floodwall have been or are in the process of being improved with interim protection only. This entire section of floodwall is approximately two feet below the pre-Katrina authorized levels. It is our understanding that the Corps plans to raise this floodwall only once to the 100 year level. In the meantime this long section of protection is two feet below pre-Katrina authorized levels during the coming storm season.

The levee along the 17th Street Canal from the temporary gates and pumps at the lakefront to Pumping Station number 6 is constructed of I-wall and has been declared to be safe only up to a maximum water level of 6.0. This flood wall is still of concern during the operation of Pumping Station 6 and the lakefront temporary pumps during hurricane tidal surge.

In Orleans Parish, the outfall canal levee and I-walls along 17th Street Canal, and the London Ave. Canal were breached during Katrina. Temporary closures are in place and temporary floodgates built at the lakefront to prevent hurricane tidal surges from entering these canals. However, pumping operations during storm surges will raise these canal levels at or near the maximum water levels against these floodwalls that are considered safe with a factor of safety of $1.3 billion. Permanent pumping stations and floodwalls are needed to alleviate this temporary fix. This project has been postponed pending the decision on the President's request to transfer $1.3 billion to the west bank projects. Planning and construction of these projects at the three outfall canals is vital to the ultimate protection of the community, and funding must be restored or replaced as soon as possible.

The 5.2 miles of lakefront levees in Orleans parish west of the IHNC are approximately 1 to 2 feet below pre-Katrina authorized levels. The 12 mile lakefront levee

from the Lakefront Airport to South Point also needs to be raised 1 to 2 feet to bring it to pre-Katrina authorized levels.

In addition, the 13 mile levee south of South Point along Bayou Sauvage and then back west along the Gulf Intercoastal Waterway (GIWW) to the Inner Harbor Navigation Canal (IHNC) needs to be raised 1 to 2 feet to bring it up to the pre-Katrina authorized level. Highway 11, highway 90 and the CSX railroad floodgates all need to be raised as much as 5 feet.

The Corps is completing the last of three earthen levee raisings on the IHNC to meet pre-Katrina authorized level. There are sections of I-walls that have subsided on the IHNC, but weren't damaged by the storms. TFG replaced breeched floodwalls on the IHNC with new T-walls which are designed to hold water all the way to the top of the wall. The older remaining I-walls were only designed to hold water with a 2 foot free board at the top. The new T-wall was built to the new datum, which was up to 2 feet higher than the old datum, so in the end we have a new T-wall next to an old I-wall with the T-wall able to hold back 4 to 5 feet more water than the older I-wall. Should we have another storm there is a potential that the older lower I-wall could fail or be over topped during the next storm.

The IHNC corridor must be closed from hurricane tidal surges to provide pre-Katrina authorized level of protection. The Corps has developed plans to accomplish this with gate closures across the GIWW and MRGO and the IHNC at Lake Pontchartrain. These gates are still in the planning stages with construction starts scheduled for the fall of 2008, providing funding is available. Meanwhile, the protection along this corridor is spotty at best.

While this report paints a rather bleak picture, the Corps is proceeding to complete pre-Katrina authorized protection under the Task Force Hope program. Funding has now become an issue because of the inflated costs of construction in the area, post Katrina.

It is urgent that the congress provide additional funding for completing the pre-Katrina authorized level of protection this year. Funding for the 100 year event must be approved and that program started immediately. The Corps must be given flexibility in spending within the jurisdiction of the SLFPA-E so that sufficient protection can be constructed as soon as possible.

Many floodwalls should not be raised twice, once to pre-Katrina and then to 100 year levels. They must be raised immediately to the 100 year level as soon as that elevation is established by the IPET scientists. Until then, the protection for the New Orleans East Bank area is less than Congress authorized with the Lake Pontchartrain and Vicinity Hurricane Protection Plan in the 1960's. The people of this community deserve better.

Thank you for the opportunity to present this report on the status of the hurricane protection system for the Southeast Louisiana Flood Protection Authority—East. I will be happy to answer any questions at the proper time.

Senator BOXER. Thank you so much. Here is what we are going to do. I'm going to pass and I hope and I urge all non-Louisianians to pass this around so we can give five minutes apiece to our Louisiana Senators who are just dying to ask questions. And then each of us will have 30 seconds to make a closing comment so that's how we are going to do this. All right?

So, Senator Vitter, 5 minutes.

Senator VITTER. Thank you, Madame Chair, and I will be brief, in less than 5 minutes.

Mayor Roach, nationally when we talk about coastal erosion, there is a tendency to focus in Louisiana, on southeast Louisiana where perhaps the rates of erosio are higher, but explain to us the very significant impact it's having and that growing impact on southwest Louisiana.

Mr. ROACH. Senator Vitter, for years we have been supporting the efforts of the State to focus on southeast Louisiana. As a result of Hurricane Rita I'm concerned that we ar not going to be able to sit quiet much longer, because of the storm surge of Hurricane Rita, the saltwater that came into the marshes and has stayed there over a year and in some areas it's still present. The deterioration of the marshes is now getting to a critical level and that's why

the projects that I tried to outline to the committee earlier are so important to get funded, because those projects were protecting areas, those projects have been destroyed and now we are having an accelerated rate of deterioration in those marshes which will mirror what is happening in southeast Louisiana if we don't get a handle on that pretty quick.

Senator VITTER. Thank you.

Mr. Jackson, do you share my and others very strong concerns with this administration proposal to shift $1.3 billion of funding between projects and not to immediately add new money to that ongoing work?

Mr. JACKSON. Yes, I do, Senator. My board debated that issue for over three hours and passed a resolution that we strongly oppose that transfer of funds because there are many critical projects on the east bank of the river that this was dedicated to that will go uncompleted.

Senator VITTER. Thank you.

And finally, Dr. Twilley, how would you rate the success of Davis Pond and Canarvon and what do we have to do different or better or bigger?

Mr. TWILLEY. We could have a huge impact, I think, on coastal restoration in this State just by reauthorizing every water control structure that now exists. It wouldn't cost a penny. And what you would have to put in that language to say that those water control structures are to effectively help sustain and stabilize this coastal landscape.

If you look at the original legislation for Canarvon and I'm not certain about Davis Pond, but I think this is true, that they were for salinity control, not to build land. We have to reauthorize those so that whoever owns them and has a title is held accountable that they are operated to restore the landscape and then there is accountability to do what you are just recommending. Right now you can't because authorization doesn't require it.

Senator VITTER. Thank you very much, Madame Chair, and I will yield my time, two minutes and 15 seconds under.

Senator BOXER. All right. Senator Landrieu.

Senator LANDRIEU. I would like to follow up, Dr. Twilley, with that, because there are many skeptics in Washington that we continue unfortunately to hear from that go along something like: It can't be done. Why start a project that won't have any hope? How are we going to restore the wetlands? So could you just give us one minute of your best why and how and what is working and the fact that the science shows that we have made a lot of progress in that area.

Mr. TWILLEY. Well, my comments will have some fundamental assumptions that we are still working on, but one is, is that for 4,000 years this coastline was sustainable. It was the human settlement and the misuse of the river that started the decline and degradation. During that 4,000 years there was subsidence. During this 4,000 years there were hurricanes. During this 4,000 years there was sea level rise. In fact, some scientists and some models say the sea level rise may have been three times higher than it is today. My point is, given the proper river resources, this coastline is sustainable even with those complications, but it's going to re-

quire a huge commitment and tradeoffs related to putting those river resources back into the flood planes of this State and maintain the economic viability that we all are also going to demand.

But it's not just coastal Louisiana. It's coastal North Carolina. It's the eastern shore of Maryland. It's Rhode Island. It's everywhere you are faced with infrastructure, engineering, economic resources and sustainability of natural landscape.

Senator LANDRIEU. I would like to follow up with, as this committee knows well, that navigation was the driving force, channelization of rivers and navigation with some thought given to flood protection and virtually no thought given to the sustainment of the wetlands that in large measure by the nature of a port surround port infrastructure. Ports are not built on the tops of mountains, obviously. They are built close to the seashore.

So Reauthorizing, Madame Chair, which this committee is tasked to do, could really move this country forward, not just for this coast but for all coasts in America that really depend on us to take a new look.

Mr. Jackson, I wanted to ask you, you have been just new on board and your testimony was really music to our ears. Our members don't realize it's been a long time waiting for one person to walk to that table to speak for a group of levee boards now working together. But how are you being received by Orleans officials, Jefferson officials and St. Bernard officials to date? And I know it's early, but would you describe the level of cooperation that you are experiencing from those three parishes as very good, moderate or not so good?

Mr. JACKSON. Senator, I'm happy to report that I would classify it as excellent. I happen to have known a lot of these officials prior to taking on this position and their cooperation has been excellent: St. Bernard Parish and their parish president, as well as Jefferson Parish and their president. Our dealings with the City of New Orleans have been through the New Orleans Sewerage and Water Board, and I have got a long-term relationship, so perhaps my prior relationships have helped that cooperation.

Senator LANDRIEU. Mayor Roach, just finally, can you just give 30 seconds on—you touched on this briefly, but the significance of this energy coast in southwest Louisiana? We think about it only out of central or southeast, but what is happening with these liquefied natural gas plants now and how is the lack of money for additional and appropriate dredging hampering our abilities to get natural gas into the country?

Mr. ROACH. Madame Senator, the problem we are experiencing in southwest Louisiana, especially along the Ship Channel, has to do with the dredging and the maintenance of that ship channel. It is at critical levels—it was at critical levels before Hurricane Rita. It is now worse as a result of that. And what happens is not only the channel becomes shallower, it also becomes narrower. And if you know anything about LNG boats, you understand that those ships don't move well under those conditions. And we are just going to have increased pressure as a result of not only LNG, but the two refineries that are being supported by that channel.

So we have to balance the maintenance of that channel with the preservation of the wetlands. We were able to, I think, get that bal-

ance before Rita, but as a result of the problems we are experiencing now with the Cameron-Creole Watershed Project in particular, we are going to, I think, risk a significant disruption of those wetlands.

Senator LANDRIEU. I know the committee members know this, but I will finalize with this. That the whole country needs more natural gas now, today. We have ships coming into Louisiana because we permit these sites when others won't. We want to get this natural gas into the country.

But, Madame Chair, because there is not enough money in the Corps of Engineers' budget for the appropriate kind of dredging and then support of the wetlands, we are light loading ships.

Now, we have enough natural gas to keep the lights on. The question is: Does Maryland? Does Rhode Island? Does California? So these ships are trying to get to you all and we don't have the resources here to manage this coast in a way that helps move these products, move these ships and keeps the people safe that happen to live on both sides of these canals.

Mr. ROACH. And, Madame Senator, WRDA can help us in that regard.

Senator LANDRIEU. Thank you.

Mr. ROACH. If the committee can help us with that, we'd appreciate it.

Senator LANDRIEU. I will yield back my time.

Senator BOXER. Thank you so much, Senator.

So we will come to 30-second closing statements.

Senator Vitter.

Senator VITTER. Madame Chair, I just want to end where I began thanking you and the entire committee, particularly those folks here, for making the trip down and really seeing this firsthand, hearing about it firsthand, but seeing it outside of this building firsthand. I think it's enormously important and I'm very hopeful that's going to bear fruit this year, and I'm hopeful the first fruit it will bear is passing the WRDA bill. Thank you.

Senator BOXER. Thank you, Senator.Senator Landrieu.

Senator LANDRIEU. Thank you. Again a call to pass the WRDA bill as soon as we can, to move that bill which is critical. I believe the State has made tremendous progress in the consolidation of the levee boards, in the development of a master plan that recognizes all of the great strengths and challenges of this coast, but, Madame Chair, as this committee has pointed out, while the tragedy struck here in Katrina and Rita for Louisiana, it could strike and will strike somewhere else. So let's get these lessons learned, learn how to move through the red tape to build a better levee system, better coastal system and prevent this from happening in the future so that we can encourage the community here in New Orleans and Louisiana.

Senator BOXER. Thank you, Senator.Senator Isakson.

Senator ISAKSON. Well, thank you. I think what Dr. Twilley and Mayor Roach really said the challenge is to balance our economic interests and our environmental interests so that they can survive together and the first step in doing that is passing WRDA and I remain committed to doing to it so to see that we get it done.

Thank you, Madame Chairman.

Senator BOXER. Thank you.Senator Cardin.

Senator CARDIN. Thank you, Madame Chair. First, I believe that the strength of the community starts with its neighborhoods and there are too many sparsely populated communities here in New Orleans. And there are multiple problems for people coming back, but it starts with safety. We want to make sure that it's safe to bring your family back. That's why it's so important for us to get it right in regards to the levees, in regards to the canals and in regards to the buffer zones. I think it's critically important that we do that.

I will just make one final point. In Maryland we did Poplar Island for a dredge site that broke a lot of the rules because it cost more money, but provided for us to have a buffer zone, in addition to a site for dredge material as well as wetland preservation and coastland preservation. So I think we need to look at ways in which we can be creative in helping this community.

And I just want to thank again Senator Landrieu and Senator Vitter. You are correct. We need to be here. We thank you for the invitation.

Senator BOXER. Senator Klobuchar.

Senator KLOBUCHAR. Thank you, Madame Chair, and to our two host Senators for bringing us here.

I think one of the most hopeful things I heard today was you, Dr. Twilley, talking about how we could save this coastline. But also, the other piece of what you talked about was how this has to be a collective effort as you referenced the other coastlines in the United States. I talked about earlier Minnesota and how we are integrally interrelated here.

I also noted, Ms. Coffee, how you talked about in your testimony that this is a race against time and that it is all of our responsibility. And that's what I will take away from this hearing. In Al Gore's book he ends with a quote from Omar Bradley and he said: We need to stop steering our ships, not by the lights of each passing ship, but by the stars. And so I will come away from this knowing that we need an integrated plan, but that you are all devoted to that. Thank you.

Senator BOXER. Thank you, Senator.

Senator Whitehouse.

Senator WHITEHOUSE. Thank you, Chairman Boxer. One of the reasons I chose to come down was because I attended my first State of the Union address as a new U.S. Senator and I listened for two words that I did not hear in President Bush's State of the Union address. I did not hear the word "Katrina" spoken and I did not here the word "New Orleans" spoken. And I'm concerned that that might lead people to conclude that we in Washington think that the need for Federal attention to this is over and that New Orleans can safely be forgotten. And I'm just here to say that we admire your courage and resiliency in dealing with this here a year and a half later, and still working so hard. We do not believe, at least in the Senate, that the need for Federal attention to New Orleans is over, and you are certainly not forgotten. Thank you.

Senator BOXER. Thank you Senator, for those statements.

I want to close by saying I agree with the statements of all my colleagues and, of course, I will add a couple of more thank you.

Again, thank you to the Court for the beautiful room. I want to thank the Corps for the fine tour they gave us both last night and this morning. Very important to see these things and understand it better.

Thank you to the witnesses. I know I was kind of forcing you to be quick. I'm sorry about that, but that's just the way it goes. And you were succinct but you were understood.

For me, this has been invaluable and very clearly Louisiana still needs us, still needs our help. And as long as I have the chairmanship—and one never knows from day to day because the Senate is so closely divided. Another day it could be Senator Inhofe. Today it's Senator Boxer. As long as I have this gavel I will never forget what I saw here today and I know that I have work to do with your two Senators and with the members of this committee who I thank so much for coming. This was just a—just so you know, this is an unusually high turnout of Senators. As Senator Vitter said, seven percent of the Senate here with you today.

But in addition to saying that I want to make the smart investments that we have to make, I want to be specific about what I'm going to do, because I think a lot of times it's just rhetoric and I want to be clear. All of us have spoken for the need for the WRDA bill, the Water Resources Development Act. I commit to you it will be marked up by the end of March. That is a committment. I commit to you that I will work with your two Senators to get it brought up on the floor and get it done as soon as possible, so that's one thing.

I will work on this MRGO problem because I think we need to. I was saying, you know, when Mr. Woodley, my friend, said, we already know a lot of what we have to do. It reminded me of when they are testing a new drug to see if it really works, say, on cancer or something. Then after a certain time they say: Well, we know the answer, it works, so we are going to stop the testing and we are moving forward. It seems to me you know the answer, so let's get on with it.

I'm going to keep my eye on the $1.3 billion because I think that's really in many ways to me a moral issue. If something was an emergency once, it's still an emergency and we just can't say we are doing something when we go to the regular budget process. And we are going to work on levees. We are going on work on pumps. We are going to work on gates. We are going to do all these things, and we are going to do it with your two Senators and the leadership that they have shown.

And to all of you here, thank you for coming. I hope we have restored a sense of hope if you have lost any. As Senator Whitehouse said, believe me, your two Senators don't let us forget you, not for 5 minutes. Whether it's in committees, whether it's at lunch, whether it's walking through the halls or meeting one of them in the elevator, believe me, they have you front and center.

So with that I'm going to say thank you for your hospitality and this hearing is closing at this time.

[Whereupon, the committee was adjourned.]

[Additional statements submitted for the record follow.]

[Note: Coastal Protection and Restoration Authority of Louisiana; Integrated Ecosystem Restoration and Hurricane Protection: Lou-

isiana's Comprehensive Master Plan for a Sustainable Coast can be found in Committee files.]

SOME OBSERVATIONS AND RECOMMENDATIONS FOR THOSE PLANNING FOR AND RESPONDING TO ENVIRONMENTAL CHALLENGES PRESENTED BY MAJOR DISASTERS

Prepared by
Louisiana Department of Environmental Quality

Based On Agency Experiences In Emergency Response, Cleanup, And Recovery Efforts Following Hurricanes Katrina And Rita.

Prepared for
U.S. Senate Committee on Environment and Public Works

Prepared in response to Senator Johnny Isakson's request made at the
Senate Committee On Environment And Public Works Full Committee Field Hearing On Moving Forward After Hurricanes Katrina And Rita
February 26, 2007
Louisiana Supreme Court Building, New Orleans, Louisiana

April 16, 2007

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1.0 INTRODUCTION

On February 26, 2007, Louisiana Department of Environmental Quality (LDEQ) Secretary Dr. Mike McDaniel testified before the U.S. Senate Committee on Environment and Public Works at its Field Hearing on Moving Forward after Hurricanes Katrina and Rita. Dr. McDaniel's testimony focused on debris management and landfill issues associated with cleanup and recovery from the storms. His oral and written testimony along with supporting exhibits were submitted for the hearing record and may be accessed through the Committee or LDEQ's website at http://www.deq.louisiana.gov/portal/.

In his testimony, Dr. McDaniel suggested that the Committee consider the development of a "playbook" or guidance document for those having to deal with environmental issues arising from major disasters. This document would capture and build on lessons learned during the Katrina and Rita disasters and provide valuable guidance for those having to contend with major disasters in the future.

During the course of discussions following Dr. McDaniel's testimony, Senator Johnny Isakson referred to Dr. McDaniel's suggestion of a federal playbook and requested that he submit to the Committee his recommendations and advice to help others responding to future catastrophes. This document responds to that request. It represents the input from the Department's Executive Staff, who have been on the front lines in responding to the environmental challenges brought by Hurricanes Katrina and Rita. It is obviously presented from the perspective of LDEQ's experience in response and recovery efforts following the storms. However, we feel many of the observations and recommendations we provide would be applicable to environmental challenges brought by almost any major disaster.

We thank Senator Isakson and the Committee for presenting us with the opportunity to submit this document and trust that it stimulates discussions and actions that will be helpful to those responding to the next major disaster.

2.0 BACKGROUND

On August 29, 2005, Hurricane Katrina struck southeast Louisiana causing widespread damage to coastal areas of Louisiana, Mississippi, and Alabama. Less than a month later on September 24, 2005, Hurricane Rita struck southwest Louisiana, causing widespread damage along the Louisiana and Texas coasts and causing further damage within a number of the same parishes devastated earlier by Hurricane Katrina, notably the City of New Orleans, and Jefferson, Plaquemines, St. Bernard, and St. Tammany Parishes. Each of these powerful hurricanes individually presented disasters of historic proportions. In addition to the damage caused by wind, rain, and storm surges brought by these two storms, the overtopping and failure of levees and floodwalls caused by Hurricane Katrina resulted in a rapid flooding of over 80 percent of the metropolitan New Orleans area. The combination of hurricane impacts and flooding of the New Orleans area represented an unprecedented natural disaster for Louisiana and its coastal neighbors as well as the nation.

LDEQ's responsibilities under Louisiana's Emergency Operations Plan are limited primarily to Environmental Support Function 10 – Oil Spill, Hazardous Materials and Radiation. However, the Department responded to a broad range of needs immediately following the storms including:

- **Search and rescue**
- **Reconnaissance, damage and environmental threats assessment**
- **Environmental sampling and assessment**
- **Hazardous and radioactive materials management**
- **Recovery and environmental regulatory assistance**

And, of course

- **Debris Management** – In Louisiana alone, Hurricanes Katrina and Rita left in their wake over 62 million cubic yards of debris. In addition to vegetative debris and demolished structures, there were approximately 150,000 flood damaged homes, 350,000 abandoned vehicles, and 60,000 abandoned vessels to be dealt with.

  In accordance with national emergency response plans, the U.S. Army Corps of Engineers (Corps) was assigned responsibility for the management of debris from Hurricanes Katrina and Rita. Although LDEQ has no directly assigned responsibilities for debris management under the state's Emergency Operating Plan, we do have statutory responsibilities for the regulation of solid waste and protection of the environment. From the onset, we have worked with the Corps, providing technical and regulatory assistance for their debris mission activities. Perhaps our most important roles have included working in conjunction with local governments to identify and approve sites for debris management and to provide oversight to see that debris is handled and disposed of in an expeditious and environmentally sound manner.

3.0 ORGANIZATION OF RESPONSE

We have organized this document in a manner similar to After Action Reports prepared by various agencies to review their performance in response to the hurricanes and to plan for future disasters. We provide observations (lessons learned) based on our experience of (1) what went well, (2) what didn't go well and needs to be improved, and (3) recommendations we feel would be helpful to those having to deal with environmental emergencies following future disasters.

4.0 WHAT WORKED WELL

4.1 Unified Command Center/Incident Management Team

Immediately following Katrina's landfall, an Incident Management Team (IMT) began assembling at LDEQ's headquarters in the Galvez building in downtown Baton Rouge. A Unified Command Center (UCC) was established to house and support the IMT.

Working from the UCC were LDEQ, representatives from the U.S. Environmental Protection Agency (EPA), U.S. Coast Guard (USCG), U.S. Army Corps of Engineers (Corps), National Oceanographic and Atmospheric Agency (NOAA), U.S. Geological Survey (USGS), Louisiana Oil Spill Coordinator's Office (LOSCO), Louisiana Department of Health and Hospitals (LDHH), Texas Commission on Environmental Quality (TCEQ) and local governments. As the post-storm situation stabilized and facilities and supporting infrastructure became available, the UCC was moved to New Orleans for obvious logistical advantages.

A similar IMT and UCC was established at LDEQ's southwest regional office in Lake Charles following Hurricane Rita.

The Unified Command Center and Incident Management Team collaboration and coordination worked exceedingly well for those local, state, and federal agencies dealing with the environmental issues following the storms. It was an efficient and effective means to address issues overlapping multiple jurisdictions.

Given the challenges faced by LDEQ, we were especially appreciative of good working relationships with EPA Region 6 and the local Corps debris management staff.

4.2 Emergency Management Assistance Compact (EMAC)

Ratified by Congress and passed into law in 1996, the Emergency Management Assistance Compact (EMAC) is an interstate mutual aid agreement that provides a mechanism for sharing personnel, resources, equipment and assets among states during emergencies and disasters.

Immediately following Hurricane Katrina, TCEQ graciously offered the services of about 20 members of its Strike Teams. The formal securing of this support was accomplished through the EMAC process. These individuals were well trained and equipped, blended immediately into the IMT emergency response field teams, and provided valuable assistance in the early storm response efforts. They departed back to Texas in advance of Hurricane Rita. Later, the Arkansas Department of Environmental Quality provided some of their staff to support the IMT emergency response efforts.

4.3 Employment of Remote Sensing Technologies for Reconnaissance and Damage and Threat Assessment

Aside from search and rescue, the first immediate need for environmental emergency response following a major disaster is to conduct reconnaissance and damage and threat assessment to guide response efforts. Areas of immediate concern to LDEQ, EPA,USCG, LOSCO, and other IMT partners included oil spills, ruptured pipelines, industrial facilities, rail cars, barges, water treatment facilities, wastewater treatment plants, radioactive materials, and NPL (superfund) sites.

We were fortunate to have made available to us a variety of remote sensing assets that served as a force multiplier, allowing reconnaissance of vast areas with a relatively small investment of personnel. Satellite imagery provided shortly following the storms allowed observations of environmental conditions and damage over broad areas and was invaluable in guiding

access and logistics for reconnaissance and damage and threat assessment in the flooded areas of metro New Orleans. High resolution aerial photography (also provided shortly following the hurricanes) allowed us to take detailed looks at individual industrial facilities, rail cars, barges, wastewater treatment facilities, pipeline breaks, and oil and fuel spills as well as at access points for sampling. EPA Region 6 sent over its ASPECT aircraft with air sampling, remote sensing, aerial photography, and geographical positioning capabilities. At LDEQ's request, EPA Region 6 also helped contract, on an emergency basis, a helicopter-mounted HAWK camera system. The HAWK camera is an infrared sensing technology that can image emissions of volatile organic compounds that are invisible to the naked eye. This capability was invaluable for remotely inspecting rail cars and barges for leaks, helping spot broken gas lines, fuel spills, and leaking product storage vessels at industrial facilities.

After LDEQ identified all locations of facilities holding radioactive materials licenses and requested security for those of special concern, the U.S. Department of Energy provided overflights of the storm damaged areas with high sensitivity radiation detectors. These overflights provided assurance that we had no loose radioactive sources of significance in the areas investigated.

4.4 Communications Reference

To facilitate both internal and external communications during the emergency response activities, LDEQ prepared a communications reference that listed points of contact and communications information for the various areas of agency activities. This was distributed widely to our IMT partners and to outside interests through e-mail and web site postings. We received considerable positive feedback, particularly from the private sector, for providing this means of facilitating communication with the agency in the early days following the storms.

4.5 Emergency Declarations and Orders

On Sunday, August 28, 2005, LDEQ Secretary McDaniel convened a special meeting of his staff to discuss preparations in advance of Hurricane Katrina. One of the outcomes of that meeting was a Declaration of Emergency and Administrative Order (emergency order), which the Secretary signed on August 30, 2005 to address the emergency conditions and measures deemed necessary in the wake of Hurricane Katrina to prevent irreparable damage to the environment and serious threat to life or safety throughout the designated emergency areas. Considering post-landfall conditions, a nearly identical emergency order was issued on September 27, 2005 in response to Hurricane Rita.

These emergency orders have been revised and reissued every sixty days based on additional information and changing conditions; they are still in effect in the most severely affected areas. Each order contained certain measures specifically authorized by LDEQ and determined necessary to respond to the emergency. Exhibits 1 and 2 in Dr. McDaniel's written testimony contained the latest two versions of the Hurricane Katrina emergency order at the time he testified; the Hurricane Rita orders are very similar.

LDEQ has a duty under the Louisiana Constitution to strike an appropriate balance between protection of the environment and economic, social, and other factors, consistent with the health, safety, and welfare of the people. The emergency orders have been an important part of LDEQ's fulfillment of that duty in the aftermath of Hurricanes Katrina and Rita. LDEQ's goal and expectation has been that the emergency orders would provide the information and regulatory flexibility to allow debris management and other recovery-related activities to occur as quickly as possible and in an environmentally sound manner.

Purpose of emergency orders

The emergency orders serve the dual purposes of:

- providing regulatory flexibility essential to the hurricane recovery efforts, as allowed under the Louisiana Environmental Quality Act (see, e.g., La. R. S. 30:2033), and
- providing useful information to the public about Louisiana's environmental laws and regulations.

Regulatory flexibility

The regulatory flexibility provided by the emergency orders consisted primarily of the temporary streamlining of procedural requirements for activities in the defined Emergency Areas, in order to expedite the restoration of important services and the removal of the enormous volume of hurricane debris. The emergency orders did not allow any activity that would endanger human health or the environment, and the orders had very little effect on substantive requirements, such as the limitations on effluent discharges to waters of the state. The orders generally required such standards as would a permit but did not require the time associated with the administrative process of obtaining a permit.

It was immediately necessary to provide regulatory flexibility to allow water discharges for necessary services and activities, such as potable water treatment, sanitary discharges where systems had been damaged, temporary housing locations, and temporary gasoline dispensing locations. The affected public needed safe drinking water, functioning sanitary facilities, and adequate shelter. Fuel was needed for first responders in the first days and weeks; fuel was also needed by the public, e.g., to operate generators on a continuing basis during widespread power outages. Regulatory flexibility was provided by managing such discharges in a manner protective of human health and the environment.

4.6 Environmental Sampling and Analysis

The potential for spills/releases of unsanitary wastes and hazardous materials during the storms and subsequent flooding prompted a concern for safety of the storm victims and emergency workers moving about in the floodwaters. An extensive environmental sampling program was commenced immediately by LDEQ, EPA, and partner agencies to determine potential risks associated with the contact of flood waters. This sampling effort was extended to basically all environmental media to address public concerns and was continued for well over a year following the storms.

This environmental sampling and analysis effort was probably among the largest and most intensive environmental characterizations ever undertaken. LDEQ along with EPA and other partner agencies collected thousands of environmental samples including floodwaters, Lake Pontchartrain and surrounding coastal areas, Mississippi River, sediment and soils, seafood, and air quality. Over a million individual analyses were performed.

Analytical results were compared to conservative health-based screening levels developed by EPA and LDEQ. Summaries and general assessments of the data were developed by EPA and LDEQ with input from the Centers for Disease Control (CDC), the Agency for Toxic Substances and Disease Registry (ATSDR), the Louisiana Department of Health and Hospitals (LDHH), and FEMA. The data and health risk assessments were presented to the public on EPA and LDEQ websites, through written reports, and at public meetings.

A more detailed description of the environmental sampling program can be found in our written testimony, and data gathered during the effort can be found on LDEQ and EPA websites.

4.7 Debris Management

Following landfall of Hurricane Katrina, LDEQ joined forces with other federal, state, and local agencies for the purpose of orchestrating and implementing a plan for the management of the then estimated more than 55 million cubic yards of debris. Designated as "Debris Operations", these agencies met daily, sometimes meeting two or three times a day as sub-committees, to address planning needs, actual and potential legal issues, agency authority and resources, and to organize which agencies would be responsible for particular tasks in the overall mission. For example, one of the subcommittees was charged with the development of a checklist and/or flow diagram to be used as a tool by state and local government entities to assist them in making a decision on the condemnation and demolition of public and private buildings and residences.

It was clear that the debris mission's scope would require the expertise and resources of numerous agencies to handle the amount of hurricane debris in an efficient and environmentally sound manner. The following agencies worked in collaboration to identify the debris management mission; develop the process to authorize debris management sites; and provide guidance to local government, clean up contractors, and the public:

- City of New Orleans
- St. Bernard Parish
- Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP)
- LDEQ
- Louisiana Department of Transportation and Development (LDOTD)
- Louisiana Department of Agriculture and Forestry (LDAF)
- Louisiana Department of Wildlife and Fisheries (LDWF)
- Center for Disease Control (CDC)
- EPA and its contractors

- U.S. Federal Emergency Management Agency (Congressional, Debris, Office of General Counsel, Safety, Infrastructure)
- Corps and its contractors: Phillips and Jordan, ECC, and CERES Environmental
- U.S. Coast Guard
- U.S. Department of Agriculture
- National Disaster Medical Service/ Disaster Mortuary
- U.S. Natural Resources Conservation Service (USDA-NRCS)
- U.S. Department of Homeland Security, Office of Inspector General, Office of Audits

Debris Management Plan

The intent of the debris management plan, developed by the debris mission task force, was:

> [T]o formalize a process that will enable the State of Louisiana, [the Corps], and [FEMA] to comprehensively manage funding for large scale and complex debris clearances. The plan was also to address the responsibilities of the various Federal, State and local governmental agencies to control the removal and disposal project for the designated parishes.

The purpose of the plan was to furnish local governments with basic information on hurricane debris management within the scope of effective environmental management. Local governments were understandably unable to use normal non-emergency resources and processes to manage the unprecedented amount of hurricane debris. The plan was also designed to ensure that debris management projects met requirements of the Stafford Act, its regulations, and all applicable environmental laws; assist the state and parishes with contracting and contract monitoring as necessary; and to the extent possible, avoid eligibility, contractual, and environmental problems.

The group recognized that the plan should be considered a starting point, with recommendations for a regional disaster debris management plan requiring the approval of all government agencies before the final plan could be implemented.

With input from its debris task force partners, LDEQ prepared the Hurricane Katrina Debris Management Plan which was released on September 28, 2005, and revised on October 14, 2005. These earlier plans and lessons learned have been incorporated into LDEQ's Comprehensive Plan for Disaster Cleanup and Debris Management released July 2006 pursuant to Act 662 of the 2006 Louisiana Regular Legislative Session (and revised August 2006). A copy of this plan is contained in Dr. McDaniel's written testimony. An integral part of these plans is the segregation of debris so that the various types of debris can be properly managed and disposed. Segregation of debris occurs at multiple points in the debris handling process and Federal and State oversight has also been implemented at various points in the process to further insure proper disposal.

4.8 Hazardous Materials Management

With valuable assistance and resources provided by EPA, over 22.4 million pounds of hazardous materials (including household hazardous wastes) were collected and removed from waste streams for proper treatment and disposal. Over 4 million orphan containers – many containing hazardous materials – were collected and processed for recycling or disposal. Over 110 school laboratories were cleared of hazardous materials.

4.9 Recycling

The cleanup and management of storm-generated debris by the Debris Management Team presented one of the largest recycling efforts ever undertaken. Almost 100 percent of all green waste was ground for mulch or used for fuel. Collected and recycled were over 1 million white goods (e.g. refrigerators, freezers), almost 1 million electronic goods, and about a quarter of a million small engines. It is estimated that over 200,000 vehicles and 50,000 vessels damaged and abandoned following the storms will ultimately be scrapped and recycled. In all, it has been estimated that 37 percent of all storm generated debris has been recycled.

4.10 Joint Environmental Assessment Report

In response to public concern raised by inaccurate and misleading information and sensationalized media coverage concerning environmental conditions in the flooded portions of New Orleans, a joint environmental assessment was prepared by LDEQ, EPA, CDC, ASTDR, Corps, LDHH, FEMA, and others. The assessment report was released in December, 2005, at a news conference led by USCG Vice Admiral Thad Allen, Principal Federal Official for the Hurricane Katrina response. That a consensus of all these agencies on the assessment of environmental risk was achieved was an accomplishment in itself. Importantly, the credibility of the shoulder-to-shoulder presentation of the assessment by these combined agencies helped alleviate some of public concern about the safety of returning to New Orleans. Similarly, later reports were also issued as new data became available. A copy of the environmental assessment document is contained in the exhibits supporting our written testimony.

4.11 Documentation of Activities

The UCC/IMT efforts for environmental emergencies response and recovery were especially well-documented and offer an excellent record for those wishing to research, review, and learn from those efforts. Documentation includes: daily activity plans, sampling plans, standard operating procedures, analytical procedures, Corps Situation Reports (SitReps), EPA weekly activity reports, sampling and analysis data, decision records, written reports, presentations, extensive photographic documentation, communications records, testimony prepared for the Louisiana Legislature and the U.S. Congress, internet postings, and many other records. LDEQ has attempted to capture all related records available to the agency and compile them in a central records management repository.

5.0 WHAT DIDN'T WORK WELL AND NEEDS IMPROVEMENT

5.1 Search and Rescue

LDEQ boat crews help rescue almost 500 individuals from the New Orleans floodwaters. This was just a small part of a scrambling, heroic effort by the U.S. Coast Guard, Louisiana Department of Wildlife and Fisheries, Louisiana National Guard, and many other state and federal agencies and private citizens. As has been well-document by after-action reviews, the search and rescue effort was hampered by inadequate preparations, limited resources, poor coordination, impaired communications, and the overwhelming circumstances of the disaster. Many lessons were learned during this effort and are being incorporated into planning for future disasters by the U.S. Department of Homeland Security, FEMA, our Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP), and other affected government entities (federal, state, and local) as well as non-governmental agencies (NGAs, e.g. Red Cross) and private enterprises.

5.2 Communications

As has been well documented in the numerous after action reviews, communications capabilities for all responders were severely deficient immediately following the storms. Due to the gravity of this problem, it is believed that the communication vulnerabilities and interoperability issues are being addressed at all levels of government. As part of after action review and emergency planning for last hurricane season, LDEQ's Undersecretary was directed to assure that the agency acquire the communications capabilities to effectively respond to the next disaster.

5.3 Identification of Locations of Bulk Carriers of Large Quantities of Hazardous Materials.

Hurricanes Katrina and Rita scattered and damaged rail cars, barges, and other types of bulk carriers. Following Hurricane Katrina, LDEQ personnel worked exhaustively for over two weeks contacting shippers and conducting aerial and ground reconnaissance to try to identify and locate bulk transport containers of large quantities of hazardous materials. We were presented with stories of missing rail cars containing phosgene gas and rail cars containing corrosive materials that would eventually compromise the integrity of the containers and be released into the environment. We were fortunate that releases of hazardous materials from transport carriers were minimal. After our experience following Hurricane Katrina, we proactively began our collection of information on bulk containers of hazardous materials from shippers in advance of Hurricane Rita.

5.4 Alarmist Statements

Responding to inaccurate, misleading, and exaggerated statements/articles concerning environmental conditions following the storms consumed an inordinate amount of LDEQ's technical and communication resources as well as those of partner agencies. Reports of toxic

soup, toxic sludge, toxic dust, the killing of Lake Pontchartrain, and other alleged environmental impacts of Hurricane Katrina have been effectively refuted by scientists from state and federal environmental and public health agencies drawing on the extensive collection of sound environmental data. However, scaremongering by some individuals and organizations has unfairly stigmatized the New Orleans region and created unnecessary anxiety for those interested in returning to or visiting the region.

5.5 FEMA Blurring Debris Management Responsibilities

FEMA, EPA, LDEQ, and the Corps were all members of the debris mission task force, as noted previously in the Debris Mission Task Force section. LDEQ expected that agencies would implement their portion(s) of the debris management plan or other response and recovery activities, and that deference in environmental matters would be given to environmental agencies. As a result, LDEQ did not expect that FEMA would independently attempt to reevaluate receipt of hurricane debris at Gentilly Landfill, after the EPA and LDEQ had approved that site for receipt of such debris. EPA and LDEQ were the debris mission partners with responsibility for environmental considerations and compliance at hurricane debris disposal sites, and LDEQ had approved the site operation plan, with EPA's concurrence.

This unexpected insertion by FEMA into a smoothly running collaborative process caused direct, foreseeable impacts, not least of which was the need for both LDEQ and EPA to commit resources to addressing the various levels of concern expressed by the public, media, regulated community, and government that understandably arose.

One example of the detrimental consequences of violating this principle occurred with regard to the approved use of Gentilly Landfill to receive hurricane-related construction and demolition (C&D) debris. LDEQ issued a standard permit to Gentilly Landfill on December 28, 2004. LDEQ then issued an emergency authorization to the facility to start receiving hurricane related C&D debris on September 29, 2005. Shortly thereafter, the Corps began sending a substantial amount of C&D debris to this facility.

At FEMA's request, EPA performed an investigation and analysis concerning the potential federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) liability for use of the Gentilly Landfill and issued a memorandum November 11, 2005. In EPA's opinion, the use of this facility to receive hurricane related C&D waste would impose no CERCLA liability on FEMA. The memo offered "recommendations for current usage of the landfill to avoid a release of hazardous substances that would necessitate a superfund response." EPA's findings and conclusions were consistent with the prior study performed by the licensed engineering firm of EE&G, the Corps' subcontractor.

Without discussion or consultation with or notice to its debris mission partners LDEQ and EPA, FEMA commissioned a study by National Infrastructure Support Technical Assistance Consultants (NISTAC) to examine the potential impact by the Gentilly Landfill on the environment due to its use as a C&D landfill to receive hurricane related C&D debris. NISTAC's draft report concluded that FEMA could be exposed to high risk of future

environmental liability based on current conditions and environmental history of the Gentilly Landfill site.

Time and effort were required by both LDEQ and EPA, first to review, then to consult together, and finally to refute the findings of the draft NISTAC report that had been prematurely released. To respond to the report, LDEQ ultimately had to develop and issue a press release to refute claims in the NISTAC draft report concerning Gentilly Landfill. These expenditures reduced the resources available to focus on priority debris mission and other tasks.

Based on the never-finalized NISTAC report, FEMA instructed the Corps to limit the amount of debris sent to Gentilly Landfill on a daily basis to 5,000 cubic yards per day, which resulted in a substantial reduction from daily intake at the facility. Reduction of the amount of debris sent to Gentilly Landfill potentially had the impact of increasing time, distance, and expense for disposal.

5.6 FEMA Inconsistency

On the whole, LDEQ's working relationship with FEMA was generally productive. However, too often, our time and resources were wasted because of inconsistent interpretations, decisions, and directions from FEMA. This problem was compounded by frequent turnover of FEMA personnel and inadequate documentation/records of decisions.

5.7 Damage and Needs Assessment for Water and Wastewater Infrastructure

Although LDEQ has no direct responsibility for damage/needs assessment for wastewater and drinking water infrastructure, we do have responsibility for wastewater discharges and protection of drinking water sources. When we became involved in discussions related to needs assessment and recovery of the wastewater and drinking water infrastructures, we became aware that numerous organizations were conducting damage and needs assessments with little consistency in assumptions or methods. Cost estimates being prepared for replacement or repair of wastewater collection and treatment varied widely. Our agency then volunteered to try to rectify the situation and bring more accuracy and consistency to the cost estimates.

5.8 Inadequate Training/Familiarity with the National Response Plan (NRP), National Incident Management System (NIMS), and state Emergency Operations Plan (EOP).

Although not considered a major impediment, it would have been helpful to have had all managers and response staffs at affected local, state, and federal agencies adequately trained in NRP, NIMS, and the state's EOP. Pockets within each agency had received some training, but agency managers and field directors had to pick up the national incident management concepts on the fly. LDEQ now has required all emergency response personnel and the top three tiers of agency management to complete the NIMS training.

6.0 RECOMMENDATIONS (in no particular order)

6.1 EPA, in consultation with state agencies and appropriate federal agencies, should develop a national plan or guidelines that provide for environmental regulatory flexibility and debris management necessary to respond to emergencies. At a minimum, this plan should provide for a process to expeditiously obtain and provide authorization of activities necessary to respond to the emergency that would normally require a permit from the state environmental agency or the EPA. Even more useful would be a plan that includes agreed processes, tools, methods, guidelines, etc. This would require all affected agencies reaching consensus together before the disaster occurs.

6.2 The Unified Command/Incident Management Team organization and operations were, in our opinion, extraordinarily successful in integration and collaboration of federal, state, and local agencies with responsibilities for response to environmental emergencies. The structure and functioning of the organization should be reviewed for consideration as a model to be employed in future disaster responses.

6.3 Managers in all federal, state, and local agencies bearing responsibilities for directing emergency response and recovery efforts following major disasters should be trained in the National Incident Management System. Periodic training updates should also be required, which can easily be accomplished through computer-based training.

6.4 The federal government, through appropriate agencies, should support, maintain, and strategically pre-position remote-sensing assets for immediate reconnaissance and damage and threat assessment for environmental emergencies following major disasters. We have previously described the value of such assets (e.g. satellite imagery, high-resolution aerial photography, EPA ASPECT aircraft, HAWK mounted helicopters, and DOE radiation detecting aircraft) to our responses to Hurricanes Katrina and Rita.

6.5 Inaccurate and misleading information and sensationalized media coverage can be expected in any major disaster. The best antidote for this problem is getting accurate, credible information out to the public at the very earliest time. Federal, state, and local agencies should develop and implement procedures for expeditious environmental sampling, analysis, and reporting. This should also include established data collection protocols, data standards, and data flow. All agencies should sharpen their skills on environmental risk assessment and communication to the lay public.

6.6 The federal government should resolve the blurring of debris management responsibilities between FEMA, EPA, and state environmental and public health agencies. It is our strong opinion that FEMA should rely upon and respect the decisions of the agencies entrusted with environmental protection at the federal and state levels. Considerable time, effort, and taxpayer money were needlessly expended by FEMA's excursion into environmental decision-making for debris management.

6.7 FEMA operations should be reviewed to cure problems of inconsistency and poor documentation of decisions.

6.8 The federal government should assure and support seamless and robust communication capabilities for all federal, state, and local government agencies charged with responding to disasters.

6.9 FEMA should agree to fund pilot projects scoped and requested by EPA and LDEQ to determine if grinding and air curtain incineration of construction and demolition debris can be added to the toolbox of debris management options for emergency response and recovery. If results are favorable, these can become options for waste volume reduction in certain circumstances. If unfavorable, the question of utility has been answered and this/these options can be excluded from available options.

6.10 Several environmental statutes (especially the Clean Water Act and National Emissions Standards for Hazardous Air Pollutants [NESHAPS – asbestos]) should be reviewed and amended to provide for intelligent and protective regulatory flexibility during response and recovery following major disasters. It is our opinion that EPA enforcement discretion and no action assurance (NAA) letters are not the best answer to challenges brought by large disasters. In our written testimony, we discuss some of the emergency needs and regulatory flexibility challenges we faced in the aftermath of the storms.

6.11 The Stafford Act should be revisited to allow greater flexibility in funding for repairs/replacement of damaged infrastructure. Our understanding is that funding for substantially damaged structures such as wastewater treatment plants and collection systems can only be used to replace the damaged structures to what they were prior to the storm. In some instances, it would make more sense to allow regionalization, or allow replacement with new, perhaps less costly technologies/alternatives and also consider potential population redistributions following the disasters.

6.12 Local governments and state environmental agencies should be encouraged to review and identify potential waste management sites in planning for future disasters. LDEQ had to quickly identify, conduct environmental reviews, and clear with local governments over 400 sites for debris management following Hurricanes Katrina and Rita. We have now set about establishing and approving sites throughout the state in advance of future disasters such as hurricanes, tornadoes, floods, and ice storms. This was a consensus recommendation at the recent EPA-sponsored Workshop on Waste Management Options in Natural Disasters held March 27-29 in Baton Rouge. This planning should include consideration of special issues such as the deterrence and response to illegal dumping. Further consideration should be given to accommodating regional issues such as the quarantine for Formosan termites in Louisiana.

6.13 Current debris management procedures for storm-generated debris provide estimates only of debris subject to Corps (or local government) removal/disposal and FEMA reimbursement. For purposes of strategic management of landfill capacities and disposal, it

would be helpful to also have estimates of private and commercial debris quantities to be dealt with as well.

6.14 LDEQ suggests that the federal government look into a means of acquiring information from bulk carriers (e.g. rail cars, barges, tanker trucks) on locations of large quantities of hazardous materials, where possible, in advance of major natural disasters such as hurricanes and floods. LDEQ worked with Louisiana State Police and stakeholders to promulgate rules requiring the provision of such information whenever a declaration of emergency is issued.

6.15 Comprehensive guidance should be prepared for those having to estimate costs for FEMA reimbursements for replacement or repair of wastewater collection and treatment systems, as well as drinking water treatment and distribution systems for water and wastewater damaged by a major disaster.

7.0 FOLLOW-UP

Details for observations made in this document can generally be found in our written testimony and supporting exhibits provided to the Committee. However, LDEQ would be happy to provide additional information, if desired, or answer any questions the Committee might have related to information in the testimony or this document.

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