

Commission Meeting

of

STATE BEACH EROSION COMMISSION

"Effects of Hurricane Felix on local beaches,
new beach protection technologies and ideas,
DEP plan for future expenditure of
Shore Protection Fund moneys,
Office of Emergency Management report
on mitigation projects"

LOCATION: Ocean City
Municipal Hall
Ocean City, New Jersey

DATE: September 20, 1995
11:00 a.m.

MEMBERS OF COMMISSION PRESENT:

New Jersey State Library

Assemblyman John C. Gibson, Vice Chairman

PUBLIC MEMBER:

Stephen Kempf

ALSO PRESENT:

Assemblyman Nicholas Asselta
District 1

Assemblyman Francis J. Blee
District 2

George J. LeBlanc
Office of Legislative Services
Aide, State Beach Erosion Commission



Hearing Recorded and Transcribed by

The Office of Legislative Services, Public Information Office,
Hearing Unit, State House Annex, CN 068, Trenton, New Jersey 08625

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Chairman
HENRY C. GIBSON

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R. STEPHEN KEMPF



STATE OF NEW JERSEY
STATE BEACH EROSION COMMISSION

STATE HOUSE ANNEX
CN-068
TRENTON, NJ 08625-0068
(609) 292-7676

NOTICE OF COMMISSION MEETING

The State Beach Erosion Commission is expected to hear testimony at a commission meeting on the following topics:

Effects of Hurricane Felix on Local Beaches
New Beach Protection Technologies and Ideas
DEP Plan for Future Expenditure of Shore Protection Fund Monies
Office of Emergency Management Report on Mitigation Projects

The Commission will hear from local shore mayors, and representatives of the New Jersey Department of Environmental Protection, the State's Office of Emergency Management, and several businesses involved in the testing, manufacture and sale of beach devices.

The meeting will be held on Wednesday, September 20, 1995 at 11:00 AM at the Ocean City Municipal Hall, Ocean City, New Jersey.

The public may address comments and questions to George LeBlanc Commission Aide, at (609) 292-7676. Anyone wishing to testify should contact Elva Thomas, secretary, at (609) 292-7676. Those persons presenting written testimony should provide 15 copies to the commission on the day of the hearing.

DIRECTIONS:

Garden State Parkway South

Take Exit 30 (Somers Point, Ocean City). After toll, proceed to stop sign. Continue straight through stop sign approximately 1 mile to circle. Go halfway around circle to bridge into Ocean City (1.9 miles). In Ocean City, Municipal Hall is at corner of 9th Street and Asbury Avenue (3rd traffic light). Enter Municipal Hall on ground level entrance on 9th Street. Take elevator to 3rd floor, Council Chambers on left.

Atlantic City Expressway

Take Exit 7S to the Garden State Parkway (South). Follow directions for Garden State Parkway South (above).

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Assistive listening devices available upon 24 hours prior notice to the committee aide(s) listed above

TABLE OF CONTENTS

Page

Bernard J. Moore Administrator Division of Engineering and Construction Natural and Historic Resources New Jersey Department of Environmental Protection	5
Anthony S. Mangeri Operational Planning Bureau Disaster Preparedness Planning Unit Emergency Management Section New Jersey State Police	9
Francis J. McCall Director Cape May County Emergency Management Communications Center	14
James Caterina President Caterina Supply, Inc.	19
Clark W. Engle Manufacturer's Representative Engle Sales Associates Nicolon Mirafi Group	20
David Casey Officer L.W. Spaulding Enterprise, Company	28
Henry S. Knight Mayor Ocean City, New Jersey	32
Meg Smith Private Citizen	34
Elizabeth R. Bergus Chairperson Beach Inlet and Bay Stabilization Company for Cape May County	34

TABLE OF CONTENTS (continued)

	<u>Page</u>
James Alexis Assistant Director Public Works Middle Township, New Jersey	35
Eugene A. Foley, CPA Manager/Treasurer/CFO Lower Township, New Jersey	37
Jack Bryson Telco II Phone & Computer Systems Member Ocean County Coastal Conservation Commission	38
Kenneth J. Smith President Coastal Advocate	40
Bryan Dickerson Office of the Mayor Brick Towhship, New Jersey	43
James Roney Commissioner Borough of West Cape May New Jersey Representing Mayor Jack Vassar	44
APPENDIX:	
Charts submitted by Bernard J. Moore	1x
Testimony plus attachments submitted by Anthony S. Mangeri	8x
Article Submitted by Francis J. McCall	22x

TABLE OF CONTENTS (continued)

Page

APPENDIX:

Report "Dredge Filled
Fabric Tubes" by
C. Joel Sprague, P.E.
plus attachments
Submitted by
James Caterina 23x

Venture Proposal
plus brochure
submitted by
David Casey 70x

pkm: 1-47

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ASSEMBLYMAN JOHN C. GIBSON (Vice Chairman): Good morning ladies and gentlemen. We're going to open this joint Senate and Assembly Commission on beach erosion here in lovely Ocean City. Mayor, thank you for your hospitality.

The members of the Commission today that will be listening to the testimony that's presented-- By the way I am Assemblyman Jack Gibson. I'm Vice Chairman of this Commission. Assemblyman Wolfe has another engagement, so I will act as Chairman.

We have with us Assemblyman Asselta, my colleague in the First Legislative District. After I make the introductions, each of the committee members that would chose may have some introductory remarks. The OLS staff person that is here with us is George LeBlanc, who is in charge of environmental-type committees in the Legislature.

George asked me to remind everybody who wishes to testify -- and we certainly invite your testimony today. I will give you some indication of what the agenda is before we finish, but before I forget, there is a black microphone that is recording the proceedings today. These proceedings are an officially designated legislative function. At the end of the legislative session, those things that this particular Commission learns are put into a report. The report is for the Governor of the State of New Jersey and for the entire Legislature.

By the way, the last legislative session, that I also was honored to be a part of this Commission, produced a report that made a recommendation as to the Blue Acres concept. That particular Blue Acres concept is part of the Green Acres Bond

issue that the people of New Jersey will be asked to vote on this November.

If the people decide that is the appropriate thing for New Jersey, there will be some \$30 million that will be dedicated to the acquisition -- respecting all property rights and on a voluntary basis -- of those properties where they have been in a storm prone area and decided they had enough and would like to be acquired at fair market value. The municipalities involved where those properties are located will certainly participate in that and may become the owner of that property using it for such things as beach access and the like. Anyway, it is clearly a program that my colleagues and I support and encourage you to support this November.

We also have up here, and we're honored for one of his first, if not the first, official function as a new State Assemblyman from our neighboring county of Atlantic, Frank Blee.

We have Steve Kempf up here with us, former Executive Director of the New Jersey Division of the Office of Emergency Management (sic) under the previous administration. We're pleased to have all the talents that Steve brings to our panel today.

Certainly, last but not least, we have Bernie Moore, who all of you know for the past many years has been in charge of the development and the execution of all the beach erosion projects that do, in fact, occur in New Jersey.

Our agenda will be that we will hear from Bernie Moore from the Department of Environmental Protection, who will share with us the next five-year range of projected capital improvements in the beach erosion area.

We will then hear from Anthony Mangeri from the Office of Emergency Management, who will indicate those applications that have been applied for in our municipalities that would qualify for emergency management aid. So that they can mitigate against problems that storms in the future might cause.

We also will hear about two new innovative techniques in beach erosion. One is the geotube concept, and the other one is a proposal by Larry Spaulding who will share with us his concept of how we might stretch -- we might retain the sand we put on our beaches in the longest possible time. So that we can stretch these hard-earned beach erosion dollars.

We will also follow Larry Spaulding. The mayors will have an opportunity to present to us a report on their beaches and some of the projects that they think they need to do in their municipalities with State aid certainly and possibly to do with Federal aid.

We do have a letter that has been sent to us from Congressman LoBiondo. We have a representative; Richard is here as a representative from Congressman LoBiondo's Office. He will take back any comments that the Congressman's Office should know about our beach erosion needs and how the Federal government will continue to apply themselves to our problems.

Finally, it will be open to the public.

We do have a rather complete agenda. One that I think you will be very interested in. I may have to limit the speakers to two minutes. We'll judge that based on how fast we go. We do want to give everybody a chance to have something to say.

Again, do use the black microphone when you do come up to talk. With that I would invite my colleagues for any opening comments that they would chose to make.

ASSEMBLYMAN ASSELTA: Thank you, Assemblyman. Good morning everyone. I would first like to take the opportunity to welcome our new Assemblyman colleague, Dr. Frank Blee, welcome him on this Commission, and hope he'll find this morning's input very valuable for him as it will be for everyone else.

This particular Commission has proved very valuable as Assemblyman Gibson has mentioned. The input and information that we gather from this helps us in creating positive legislation to perpetuate beaches and help the infrastructure in this area. We welcome all input today. I'm looking forward to hearing from each and every one of you. Thank you.

ASSEMBLYMAN GIBSON: Assemblyman, Dr. Blee. Are you prepared to-- Have anything or are you just happy to--

ASSEMBLYMAN BLEE: I'd like to say a few words.

ASSEMBLYMAN GIBSON: Thank you.

ASSEMBLYMAN BLEE: First of all, I'd like to thank you for graciously inviting me this morning. It's a thrill to be here. As you know, I'm your neighbor from Atlantic County, and shore protection is very, very important to our county, as well, and my district, so I'm thrilled to be here.

As was previously mentioned, I've been an Assemblyman for about 48 hours now. This is my first official hearing. I would just like to say that-- I'll reiterate one pledge that I made a few years ago, which was speak only if it's an improvement upon silence. So if you notice today, I'll be doing a lot of listening and gathering information, but don't mistake

that for any lack of concern. This is a very, very important topic and issue in our district as well. I'm just very, very happy to be here.

ASSEMBLYMAN GIBSON: Thank you.

With that I will turn this phase of the meeting over to Bernie Moore from the Department of Environmental Protection. We're very interested to hear what he has to share with us.

B E R N A R D J. M O O R E: Thank you, Mr. Chairman, members of the Commission. Today I have brought with me an outline of the spending plans that we want to implement for the stable funding that we have been receiving.

When these charts were made up, they were based on the assumption that we were going to be getting \$15 million a year for stable funding. As you may or may not know, as a result of the budget process, an additional \$3 million was put into my budget for shore protection. There has been legislation introduced that would raise the level of stable funds from \$15 million to \$18 million per year.

The first chart that I have in front of you is a chart that we normally provide to the Capital Needs Commission as part of the budget process. It shows planned expenditures for three years both for the shore protection projects that we would encompass between the State and the municipalities and, then, on the following sheets, the list of projects that we will be involved in with the Army Corps of Engineers.

The projection is that for stable funding in Fiscal 1997, we will be running about \$16.5 million of the funds. We have programmed an additional \$1.2 million of local projects

that we would take care of. That process extends right through Fiscal 1998 and 1999.

The second sheet that (shows slides) I have is a projection based on all of the Corps projects that we are currently involved in. It shows a spread from Fiscal 1996 through the year 2005. Sometimes, when you're going that far out, you're looking into a crystal ball because some of the projects and studies that we are involved in have not gone on that far. So we're in the initial stages of some of these projects, and we're kind of educating or getting the best educated guess or estimate for the cost.

But if you look just for the period of from 1996 through the year 2000, we have -- I think those figures are fairly accurate. There may be some changes because of Federal funding where a project would be designed to be completed in two fiscal years. It may slide to two and a half years to three fiscal years. So the spread of money will balance out here.

On the last sheet, I have a chart showing how we intend to use the stable funding in a relationship to the Federal dollars trying to maximize the amount of Federal input. For Fiscal 1996 that we are currently in, you can see that we intend to spend \$11.6 million of stable funds for the Army Corps projects, which will result in a total commitment of construction funds of \$42.7 million.

In Fiscal 1996, we will have three dredges working offshore of our coast. They will be in Sea Bright finishing up that project, in Long Branch just starting, and then in the area from Manasquan to Belmar. In Fiscal 1997, our expenditure was projected at \$16.5 million for a total overall commitment of the

projects at \$49.1 million. We will then have two dredges operating. We will be finishing up Long Branch, and we will be finishing up the area from Avalon to Asbury Park. So we're quite excited about that.

As you know, in Fiscal 1995, we finished the beachfill project here, the renourishment in Ocean City. We also finished the renourishment project down in Cape May City. We are just winding up the beachfill project at Monmouth Beach. So we have lots of work going on along our shoreline.

I mentioned in the beginning that we are now up to \$18 million. What money is not used for Corps matches will be used between the State and the municipal program. That's the traditional program that we have always had here in the State.

What I'm interested in this morning is when the mayors have the chance to talk as to what projects they think they need, okay. We used to do this years ago, and things haven't changed, because as soon as the announcement came out that I was getting an additional \$3 million in revenues, I had about \$10 million to \$12 million in requests that came sliding through the door real quick.

My job, now, is to look at these projects and to determine which ones I think should be done right now and then make a recommendation to the Commissioner and to this Commission as to how those funds should be spent. So we'll be looking forward seeing what recommendations and what suggestions the folks here have, Mr. Chairman.

ASSEMBLYMAN GIBSON: Thank you, Bernie.

I do have one question. In addition to the additional \$3 million that was provided on the dedicated fund, there was

\$300,000 provided for additional personnel because of the expanded workload of your office. What is the status of that?

MR. MOORE: All right. We have outlined our positions that we've wanted. We have gone to the Commissioner's office. We have gotten the approval from the Commissioner to move forward on that. All of the paperwork will probably be submitted to the personnel staff and Department of Treasury within the next coming weeks.

ASSEMBLYMAN GIBSON: Bernie mentioned a \$15 million dedicated revenue source in Fiscal 1996. It's been increased to \$18 million. We are in Fiscal 1996 for those who don't understand the fiscal calendar. The State's Fiscal 1996 starts July 1, 1995 and goes through June 30, 1996.

Part of the reason that this Committee was reformulated -- which was idle for many, many years -- two years ago was because the Legislature came up with a permanent, dedicated funding source for beach erosion. An annual amount of \$15 million funded by the Realty Transfer Tax. We'll have more to say about that before the hearing is closed. But the best way to apply to that dedicated funding is part of the work of this Commission. I just wanted to explain that.

Any questions from Commission members or Assistant Commissioner Moore? (no response) Thank you.

Is Anthony Mangeri here yet? Oh, there you are, Anthony. Anthony, you're up next. We're glad to hear from Anthony Mangeri, Office of Emergency Management with the New Jersey State Police.

Thank you.

A N T H O N Y S . M A N G E R I: Colonel Williams thanks you for your invitation today.

MR. KEMPF: Tony, would you excuse me, Mr. Chairman? Just a brief note for the record, this is being recorded. For your introduction, you introduced me as the former director of the State OEM. I'm not Tony's boss, nor do I want Colonel Williams to think I weaseled my way into the payroll somehow. I was with the Federal Emergency Management Agency, which was the last time I was down here after the storms of 1992. Tony and I happen to be good friends, but I wanted to be sure and correct that so he doesn't charge me later. (laughter)

ASSEMBLYMAN GIBSON: All right, thank you for that.

MR. MANGERI: Colonel Williams thanks you for the invitation today and Major Mom, sorry-- Colonel Williams and Major -- our Major is unavailable, sir.

Hazard mitigation must be a locally driven initiative, but there is assistance available from the State Office of Emergency Management to assist local governments in developing mitigation policies and setting up mitigation programs.

The State Hazard Mitigation Team has been very busy reviewing local and county applications for hazard mitigation assistance. The team has also been called upon to provide technical assistance to jurisdictions developing local mitigation programs.

For those that are unfamiliar, the State Office of Emergency Management got into the mitigation business in 1985 with the Department of Environmental Protection. Since then, in 1994, Executive Order No. 115 was signed which created a State

Hazard Mitigation Team, an interagency concept to focus hazard mitigation initiatives and policy statewide.

The Mitigation Team also created a mitigation plan in 1992, which was made public as a result of the December coastal storm in 1992.

Our main function is to administer the postdisaster Mitigation Grant Program and to provide technical assistance to State, county, and local entities in developing risk reduction strategies, programs, and projects. To date, the team has reviewed more than 167 applications for the Hazard Mitigation Grant Program, a Federally funded, State managed program, and has recommended 39 projects be funded by FEMA, the Federal Emergency Management Agency.

Most of the available \$2.2 million will be used to fund structural mitigation projects such as a concrete reef and geotextile tubes designed to diffuse wave action and retain sand along New Jersey's shoreline.

Many of the projects are designed to enhance local residents' knowledge of natural hazards and their communities as well. Residents will be receiving things like booklets, which contain information on floods, northeast coastal storms, and hurricanes. Information will include emergency action steps, general preparedness information for residents and visitors to our shores. Road maps to finding evacuation routes and shelters will also be available and designed for persons who are visiting during the summer months.

FEMA has approved 13 recommended projects. The remaining projects are awaiting environmental assessments, which are required by the National Environmental Policies Act, and further

Federal review such as Historical Commission requirements. Upon approval of projects, applicants will also be required to develop a hazard mitigation plan for their communities. The purpose of the planning is to centralize and focus mitigation projects and activities of various agencies together towards a common initiative. The State Hazard Mitigation Team will be conducting workshops on developing mitigation strategies and planning efforts for local and county officials.

In addition to the projects funded under the Mitigation Grant Program, the team has been working with other agencies to develop State-level natural hazard risk reduction strategies and policies. These agencies include Departments of Community Affairs, Environmental Protection, and Transportation.

The Department of Transportation has funded a major project to provide a back bay, tide-level telemetry system, which will give us information on elevations on the back bays. Tidal monitors and rain gauges will be placed in more than 30 back bay and coastal waterways locations from Cape May County to Monmouth County.

This system will be connected to a current system called IFLOWS, which provides us inundation and flood warning and hazard information and will be used by emergency management professionals to assess back bay inundation during coastal storms. DOT will also use the data to determine proper elevation for causeways and critical evacuation routes along the coast.

The Mitigation Team is also involved in research. Recently Rutgers University, Institute of Marine and Coastal Sciences was awarded a \$40,000 grant from the State Office of

Emergency Management through the Federal Office of Emergency Management to conduct research to establish baseline vulnerability data for existing coastal development.

The project also calls for the Institute to develop an education package on coastal vulnerability. The package can be used by local emergency managers to educate local officials or by educators to supplement natural science curriculum.

The State Hazard Mitigation Team is in the process of reviewing several new pieces of legislation that will greatly impact upon the State's Hazard Mitigation Program and make pre-event funding available for New Jersey's municipalities.

The National Flood Insurance Program has been revised. Under the new law, moneys may be available for State and local natural hazard mitigation projects. Regulations for the grants have not yet been issued by the Federal Emergency Management Agency but are expected this month.

A second major legislative change has been an attempt to rewrite the Robert T. Stafford Act, P.L. 93-288, which is the Federal Disaster Relief Act. The changes would create a Natural Hazard Insurance Corporation to provide insurance for residents in high hazard areas.

The revision would also make available to states, if they are in compliance, funds to do local initiatives -- local mitigation initiatives -- which may or may not include beach management projects. It's undecided, but it's a small amount compared to some that is out there. At this point, the rewrite has not been sponsored by Congress, but the State Mitigation Team and the State Office of Emergency Management are working

hard to review and determine the impacts of such new legislation.

In the package that was provided to you is an outline of our chart showing the status of each of the projects that has been proposed to FEMA which is still open. The projects are divided by the two disasters that we have had: 936 is the Halloween storm of 1991 and the 973 disaster is the December 1992 coastal storm, which was declared in March of 1993.

The projects are defined. They include things, as I said, such as sand fencing, dune grass up and down the coast, school preparedness and residential preparedness projects, and structural projects including dune walk overs, the artificial reef obviously at Avalon, and some geotextile tubes have been proposed. Remarks, for your information -- and funds that will be obligated or currently held for these projects is also listed.

In addition, some general information about hazard mitigation in the State Office of Emergency Management has been provided to you as updates for your information.

That is it, sir.

ASSEMBLYMAN GIBSON: Thank you, Anthony. Do the members of the Commission have any questions for Anthony? (no response) Thank you very much, Anthony. Your comments will be made part of the record.

I would like to ask Frank McCall, County Emergency Management Coordinator to follow you, supplement what the county is doing in the field of Emergency Management. I have been down to their Emergency Management Headquarters underneath the county library building. I was very impressed by all the facilities

that are there in order to track storms, in order to communicate with the officials and the public of this county well in advance of any kind of disaster that might result in a storm.

Frank McCall, would you please come up and supplement Anthony's comments.

F R A N C I S J. M c C A L L: Thank you, Assemblyman Gibson, Commission. We appreciate the opportunity to be heard today on behalf of the Board of Chosen Freeholders for Cape May County and the county residents in general.

Anthony and I have worked very, very closely in mitigation projects. It got to be a little bit of a joke. For a period of time Anthony would call me and tell me, "We have good news and bad news for you." I would ask Anthony to give me the bad news first. "We've rejected five of your applications for mitigation projects for Cape May County." "What's the good news, Anthony?" "What we've done is included those in statewide projects." So we appreciate the initiative, and we appreciate the opportunity to work with Anthony in a State office.

Everybody likes to be number one or in the top ten basically in everything that we do, except when you're given the designation by FEMA. FEMA, the Federal Emergency Management Agency, has declared Cape May County and the region -- including Atlantic County, Mr. Assemblyman -- as being the sixth most difficult place in the nation to deal with in the event of things like hurricanes and northeast storms because of the type of peninsula geography that we have.

ASSEMBLYMAN GIBSON: Excuse me, Frank. (witness moves microphone closer) That's it.

MR. McCALL: So with that designation of being the sixth most difficult place in the nation to deal with, we have a pivotal role with the State, with many of the local mayors, commissioners, and emergency management -- under the umbrella of the emergency management community -- to provide services.

Assemblyman, thank you for the compliments about the facility. That used to be called the basement of the library office building and now they've spent \$2 million and it's like Macy's, it's the lower level. So there is a lot of good activity there.

The freeholders, the State of New Jersey, and the Federal Emergency Management Agency thought enough of this area to dedicate that kind of funding to this kind of a process in the emergency management community. It does serve well.

Some of the things that we talk about, we understand our strengths in emergency management, and in helping to understand your strengths, it also lets you identify your weaknesses. Some of the weaknesses that we think we have in the emergency management field comes with and is typical not only to Cape May County or to our municipalities or the State of New Jersey, but it gets to be the funding process. There are all kinds of great ideas that come up, there are all kinds of great concepts. I'm sure we're going to hear about some interesting philosophies today.

The funding aspect is so important. One of the things-- I'm happy that Congressman LoBiondo's representative is here today. In the mitigation process after every disaster that is declared nationwide, there are dollars that are set aside for mitigation expenditures.

One of the most difficult things that we see today is the ability to access those mitigation dollars. They're matching funds either from the State, the local entity, or the county. In today's economic times, taxpayers are basically saying, "Please stop spending. Don't increase our taxes, don't generate dollars."

We see mitigation dollars that are out there. With the number of events that have occurred in the past five years nationally, and it's not just New Jersey, you take your Midwest flooding, your earthquake scenarios, some of the different problems on the West Coast, basically people do not have access to those mitigation dollars.

So, although they have been established in traditional fashions, maybe through the State legislators working with Congressman's LoBiondo's Office, there can be a mechanism devised to be able to access those dollars without impacting the local municipalities.

Anthony and I were talking just a little bit earlier about a project that we have in for mitigation process. It's about a \$100,000 project. Our freeholders, based on today's standards, would have to match that with about \$50,000. When we experience the budgets on an annual basis -- I think that basically most of us are fiscal conservatives -- there is going to be a hard look at how dollars are being spent. So if dollars are available, we can access those dollars without having local contributions. I think it would go a long way toward -- particularly in a place like Cape May County that has been defined as the sixth most difficult place in the nation to deal with.

So I leave you that thought. I appreciate Congressman LoBiondo's Office being here today. I thank you for the opportunity to be here.

ASSEMBLYMAN GIBSON: Thank you, Mr. McCall. Any questions from Commission members? Yes, Steve has a question for you, Frank.

MR. KEMPF: Not so much a question, Frank. You and I have discussed hazard mitigation many times, as I have with Anthony Mangeri. In the panel's packet from the OEM is a list of points about hazard mitigation. I think that it would be wise for us to understand these points, number one.

Secondly, they probably should be made available to the government and local officials that are here, so they get to understand why mitigation really is so important. Simply put, it's the reason why we put bumpers on automobiles, seat belts in cars, and fire detection systems in buildings is to prevent the catastrophic effects of disasters which we can't generally stop anyway, but we can do things about the impact of those.

Frank, I know that you have participated with me in a couple of panels and committees talking about mitigation and some of the activities involving emergency management inter-coastal protection. Do you have any thoughts, in particular, with regard to marrying those two disciplines, if you will, to further protect our shores?

MR. McCALL: Steve, there is a lot of available talent. We, in the emergency management community, call it "talent put together under the umbrella of emergency management." There are a lot of resources that are available from different disciplines. You have your engineering

discipline, the legislators, you have people in the emergency management community, the continual melding of those groups of people under a similar thought process. Because, I think, we all share the same concerns I think is helpful.

One of the things: Senator Cafiero, in 1992 during the December storms called me from Florida. He was on vacation. He wanted to know about North Wildwood. His comparison was, "How does it compare to the 1962 storm?" Well, in fact, because I guess the Senator had a little problem in 1962 down there-- But since 1962 and 1992, 30 years difference, the mitigation processes, the bulkheads that were not in existence in 1962, the beachfill projects, the jetties, the groins, all of the engineering processes, and particularly the building codes-- The 1962 storm was up to the 1962 building standards, and certainly, in 30 years the construction codes improved dramatically.

That was really 30 years worth of mitigation. That came about, Steve, as combining a lot of thought processes. So again, I urge anything that you could do to continue to meld these different disciplines together I'm sure will be helpful in the long range.

MR. KEMPF: Right, thank you, Frank.

MR. McCALL: Thank you, sir.

MR. KEMPF: Mr. Chairman, one of the reasons that I bring that point out is because one of the things we have a tendency not to do, whether it is through the media's interpretation of what's being done along the coast line, we don't have this concept along our coast and our State that the beaches are actually part of the infrastructure.

A good, sound beach and dune system is probably one of the most effective things that can be done to protect the life, safety, quality of life, and culture of the people of New Jersey. It's not just a place we can throw blankets on and get a suntan. It's as vital a part of our environment and our protection systems for the people in New Jersey and serves a purpose every bit as important as our roadway systems or our sewer, water, and electrical systems.

I think we need to think more in those terms. I don't mean "we on the Commission," because I think we're all learning that, of course. But I think "we in the State" need to look at that benefit of protecting our coast for what's behind it.

ASSEMBLYMAN GIBSON: Thank you for those comments.

We have an opportunity today to see two new innovative techniques. One that has been used, one that has been proposed. The geotubes is the first that we'll share with this Commission and those of you in the audience. They are being used in Avalon.

I personally saw the installation there. They have been used in Atlantic City, and I presume many other places, and have gotten very excellent reviews for their use. With that I would like to introduce Jim Caterina to share with us how geotubes will be an effective tool in beach erosion now and in the future.

J A M E S C A T E R I N A: My name is Jim Caterina. (off microphone) I have a company up in Williamstown. About 12 years ago I got in the business. We were handling the construction products in (indiscernible) geotextiles. We were with a company--

ASSEMBLYMAN GIBSON: Excuse me, Jim. She wants you to take the microphone over with you. (witness given microphone)

MR. CATERINA: We handle all our geotextiles from a company called Mirafi. During that period Mirafi was bought up by a company called Nicolon, which was a Dutch-owned company, who brought us the products of geotubes.

With me today is Clark Engle, who is a representative of Nicolon, to talk to you about the geotubes which we have used in Atlantic City. We've done over 7000 feet of tubes as cores for the dunes in Atlantic City and also for Avalon along their jetty system.

Clark.

C L A R K W. E N G L E: (showing slides) Can I speak from here?

ASSEMBLYMAN GIBSON: Yes, that's fine. Thank you.

MR. ENGLE: Mr. Chairman and Commission members, I thank you very much for the invitation to show you our geotubes once again. We started out about three and a half years ago, I guess, in Bernie's office or up at the Governor's conference, I think, in Asbury Park or somewhere in North Jersey, at that time to introduce the tubes to New Jersey.

Nicolon first started in Europe in 1987 on the coast of Holland and Germany, in the North Sea, with a lot of success with the tube systems. When I first brought them to New Jersey three and a half years ago, I felt like in the movie "Field of Dreams," "if you build it they will come." The New Jersey motto has to be the beach of dreams, if we maintain them they will keep coming.

I think it's important to realize also, especially for the laypeople and the general public, the beaches are more than just one system for maintaining and repairing. I'm especially appreciative of Commissioner Kempf's remarks. Because there is beach replenishment, there is beach restoration, there is beach reclamation, and there is ratable protection. All of these are different types of engineering projects in which we feel we can play an important role.

I'll just run through some of these things quickly for you. We've worked hand in hand with the Corps of Engineers throughout the United States, in the Mississippi delta, Florida, and now presently working with the Corps of Engineers for a protection system for the -- I forget -- it's a radio tower in Cape May Inlet, which is being bid right now and will be built very shortly. We work very closely with the waterways experimental stations.

The tubes can be used as containment dikes into which they can pump different types of material. The Corps is looking at a job like that on the Morris River. Hopefully the State of New Jersey can come up with the appropriate amount of funds to match the Corps, so that project may go ahead as well.

The tubes themselves are geosynthetic products. They are geotextiles. Although a patented system, it is not an off-the-shelf item. They are custom made to each particular job into which we put different types of dredge or in situ materials from the area. They can be built to develop as groins, off the shore shoals; they can be dropped in place by different barge systems; you can build them out from the shore and backfill with sand.

If anyone has the opportunity to go along the north coast of the inlet at Avalon, you'll see where the tubes were placed there three feet below low/mean tide -- very difficult project. However, that area was severely damaged year after year from the winter storms. Mother Nature was picking those giant rocks up and throwing them through those houses like they were baseballs. This year, nothing.

The last two years, in fact, they've had somewhat of a beach left; although, their project at that case is temporary. Temporary meaning five to eight years. It has served a purpose and protected ratables. Let's face it, if we don't protect the structures, the homes and the businesses at the shore, there isn't going to be a shore.

Once again we can show you different cross sections of the way we can build these things up off the coast. An interesting concept also is developing dikes like this and filling in dredge materials forming islands, opening up waterways.

I want to move ahead in the interest of time here and show you the different types that can be used and will probably be proposed off the coast of New Jersey:

- * This is similar in some nature to the Avalon job.
- * The tubes, although they look like beached whales to some people and submarines to others, in theory, once again, is a giant sausage, if you will, with certain types and sizes of input and exit ports for pressure. You take dredge material or in situ sands, pump it into the tube with water, and the water dissipates through the geotextile. The dredged or in situ material remains behind forming a core.

* Using dredged materials, using large augers off the coast of Alabama, this is.

* If anyone remembers having seen, probably Bernie, seen the job in Avalon where we had the large dredge line coming in from the bay or inlet.

* This looks like liquid mud. That's the kind of silt and material they are dealing with down there. In their instance, we must put liners in because the material is so fine it would just ooze out right through the textile. So we cause a filter cake to happen by building a liner inside, a geotextile liner inside the fabric protection liner.

* That's the start of what a tube looks like.

* Some of you may see them right now because they are exposed since the storm in Atlantic City. Atlantic City is a perfect example of protecting ratables. We put in about 7000 linear feet of tube. Those tubes no sooner were put in place, then someone said to me, "How can you prove that this works?" I said, "Pray for a storm." I didn't mean that. But a storm did come, and if it wasn't for that tube being in place, if you will look there today, you will find that the pavilion at the old convention hall or convention center in Atlantic City would have been gone and all of the boardwalk.

I can also remember the people from Donald Trump's organization coming down to the beach and the different casinos while we were putting the artificial dunes in Atlantic City saying, "Gee, there goes our cabana space." Well if the tubes weren't there, there would have been a lot more lost than cabanas.

* You can literally build dams with tubes, earthen dams.

* This is a tube laid out on the ground in which they are going to pump in contaminated materials and dump them off the shore.

* This is Atlantic City when it was being built. The plastic on the side that you see there is material just to prevent cavitation. That is as the pressure is being placed in the tube, water is building up. So by putting the plastic there, we prevent the water from eroding the formed sand around the tube. The more we form it, the better profile we can get.

* The beauty of the job in Atlantic City was that as the tubes were built, they could plant dune grass. The dune grass could actually have a greater bite. Sorry to say it wasn't there that long before the storm came and we lost most of that. But the important fact is that all we lost was the peripheral area.

The community was protected. As the write-up in the paper would show, the nursing home at the north end of Rhode Island Avenue was saved. Now, all they need to do is put a little sand back, not a lot of sand, and plant some dune grass. Hopefully, before another storm would take place, that dune grass would hold enough that it would resist some storms in the future as well.

* Now, in building dikes and offshore shoals, sometimes they will use what is commonly referred to as a garbage barge. Garbage barge being similar to any other barge, except that it will open up in the middle.

* As you can see here, they can place the material into the center of the barge. If you people will pardon my back. (witness turns to screen) They can place the material into the center of the barge where the fabric is. In this case the fabric is sewn afterwards.

* Now, you can see this is the barge out in the water at the location they wish to dump. It would be 400 feet deep-- It could be 40 feet deep depending upon what they anticipate the tube to do. The barge is opening up. If you look at the end view of the barge -- the view at the end of the barge, you see it splitting apart. A garbage barge like that will open up, I think it's around, 20 degrees.

* At that point, this filled tube will go out in an hourglass shape and drop immediately, very precisely right to the bottom at that point.

* They can do this -- as you see the water is coming in now and the unit is sinking -- they can do this with quite a bit of precision to form revetment or protection systems off the coast and drop them pretty accurately in place.

* That's an artist's concept of what I was talking about. So with the geotubes there are a lot of different things you can do and a lot of things we will do and hope to do with the State of New Jersey, as well as the Corps of Engineers throughout the country. It's a concept whose time has really come because of its economics, its versatility, and its usability.

Thank you very much.

ASSEMBLYMAN GIBSON: Thank you for the presentation. Do the Commission members have any questions? (no response)

Thank you very much.

I would just comment that some of the slides show that you're filling them with large dredges. But what you did at the north end of Avalon was with just a small hand pump that took the sand that was available and pumped it into a smaller tube. It wasn't necessary to have a big dredge there. You could--

MR. ENGLE: That's correct. The original job was done with a dredge. There was repair work done in smaller tubes the way you're describing it, yes. We also did work with a much smaller unit in Atlantic City where they suspended a small dredge piece of equipment off the shoreline immediately -- they suspended it by a crane, pumped it immediately right into the tubes.

ASSEMBLYMAN GIBSON: During a storm they would be there to add the last bit of continued protection. But in better times, when the beach is building, you wouldn't even see them.

MR. ENGLE: You won't even see them, that's correct.

ASSEMBLYMAN GIBSON: They'd be covered with sand. It would look like a natural dune.

MR. ENGLE: That's right.

ASSEMBLYMAN GIBSON: I understand in Atlantic City you did plant beach grass. If that particular storm hadn't arrived so soon, that beach grass would have nourished itself and it would have looked like a natural dune for--

MR. ENGLE: Jimmy may correct me if I'm wrong, but I think at the southern end of our project in Atlantic City around the other Bally's there was dune grass planted over some of the

units there. I don't think that was affected. The last I saw it wasn't.

ASSEMBLYMAN GIBSON: That's still there, the dune grass?

MR. ENGLE: Yes.

ASSEMBLYMAN GIBSON: So you can see it.

Thank you very much.

ASSEMBLYMAN ASSELTA: I have one question.

ASSEMBLYMAN GIBSON: Yes.

ASSEMBLYMAN ASSELTA: How affordable is this to municipalities?

MR. ENGLE: It's probably the most economical system you could come by. I think the project in Atlantic City went for approximately \$60 a linear foot installed, labor and materials.

ASSEMBLYMAN ASSELTA: Thank you.

ASSEMBLYMAN GIBSON: And a stone, timber, and bulkhead revetment in the neighborhood of \$500 a foot?

MR. ENGLE: Oh, easy.

ASSEMBLYMAN GIBSON: Easy. Very good question, Assemblyman.

MR. ENGLE: I may add that the stone systems are very cumbersome, very hard to come by.

ASSEMBLYMAN GIBSON: Thank you.

MR. ENGLE: Thank you.

MR. CATERINA: We had looked at the Sea Isle City job that Sea Isle City had done, and the tube that we were using in Atlantic City is a nine-and-a-half-foot diameter tube. We ended up with a profile of twelve foot wide and six foot high. The

comparison in price was very much similar to what they used in the north end of Sea Isle City, where they used an I-5 gravel-core dune.

As we know, in Sea Isle City, that same area has probably been done about three times in the last five years, and we've yet to hold up to anything really well. Atlantic City has proven itself after one or two storms.

Thank you.

ASSEMBLYMAN GIBSON: Thank you again.

I would invite Larry Spaulding, L.W. Spaulding Enterprises, who also has an innovative beach erosion proposal for us to hear about.

D A V I D C A S E Y: Thank you for inviting us today. My name is Dave Casey. I'm with Larry Spaulding Enterprises. I'm one of the officers and also one of the people that will be marketing this beach erosion project.

A little background. L. W. Spaulding is a construction company that has been doing business in New Jersey for the past 25 years. We were involved in new home construction, rehabbing, and also we subbed with engineering firms and environmental contractors to handle the beach construction.

As you know, due to the constant threat posed to coastal communities and property owners because of beach erosion, L. W. Spaulding Enterprises has designed a shore protection engineering technique which offers publicly and privately owned beachfront properties protection from erosion.

As stated by Mr. Moore before, New Jersey has spent over \$300 million in shore protection yearly, and the battle

goes on and so do the costs continue on. Ocean City, as of July 1995, has concluded a phase of beach replenishment to the tune of \$4.5 million or \$4.6 million. Again, you can go to each different municipality and you will find the same things happening over again.

Our erosion control system is a series of 10 to 12 foot sieve-like sand traps for a better word. They are strung littorally along a beachfront. As you can see from the picture -- that's an artist's rendering of what it will look like -- (displays picture) there will be some variations upon getting into productions.

It's an instant, cost-effective device that is intended to facilitate the preservation of sand on beaches with grades from zero degrees to 45 degrees below the horizontal plane. The uniqueness of this technology is it's ease of handling, lightweight, it's environmentally friendly, and basically maintenance free.

Installation can be completed seasonally and before pending hurricane-sized storms. Removal after winter storms allows a natural beach use, encouraging tourism to a more natural surrounding in the State. When in place, of course, protecting the beach for future use by holding back the sand that's already in place.

We are a New Jersey based company, and it's a new technology that we are trying to bring to the State. We hope to be creating new jobs in the State and stabilizing the shoreline for a better New Jersey.

I would like to thank you. We do have -- we've passed out the proposals. We have more proposals in the back.

We also have a brief outlay of what we intend to do, which we would be glad to give out to everybody.

Thank you very much for having us.

ASSEMBLYMAN GIBSON: Thank you for your participation in the hearing. Are there any questions?

MR. KEMPF: Yes, Mr. Chairman. I was just looking through this quickly and on the anchoring process is not very clear. Could you just explain how it's anchored?

MR. CASEY: Well, it would be anchored with-- As you can see these are augers. It's a technique that has been used in undersea exploration, and it's been tested in that capacity. They will be driven into the ground approximately eight to ten feet, and the couplings will be secured to the top of these augers to hold the existing fiberglass tubing with the screen.

MR. KEMPF: Basically like a screw into the wood type of thing. Is that what you are saying?

MR. CASEY: Correct. It would be screwed into the sand base which can be removed at anytime, put in place and-- During a winter season, you put them in and leave them in. Summer season you can take them out and store them, and they're reusable.

The cost-effectiveness -- it looks to us that it's going to be around \$75 a linear foot as far as installation and construction is concerned. But as you use this over and over each year, the cost quite naturally goes down.

MR. KEMPF: Have you done any testing on this product yet, either privately or with any recognized laboratories yet?

MR. CASEY: Not yet. We have been in contact with the Davidson Laboratory at Stevens Institute in Hoboken, New Jersey.

Dr. Bruno has expressed his interests and his ability to test everything we have proposed here this morning. We have consultants from around the State -- geotechnical consultants -- that will come on board as soon as we secure funding to pursue this venture.

MR. KEMPF: Thank you very much.

MR. CASEY: Thank you very much.

ASSEMBLYMAN GIBSON: Thank you, sir.

I would just mention that there is a third innovative technique that is being used rather successfully; it's the offshore breakwaters reefs. That has been used in Avalon, in what they call "an open-ended method." One end is attached to a groin, the other end is free, in two sections in Cape May Point, where they have been installed between jetties, and it's sealed from jetty to jetty. At Cape May Point, Mayor Malcolm Fraser -- he's not here today -- but I can say that he's very satisfied with the results there. He is, in fact, probably going to ask the Department, if he hasn't already asked the Department, for an opportunity to use some more of that.

So that's the third technique that this Commission has had some experience with. All of these, we look at with the idea that once we spend the tax dollars to put sand on the beach that we retain it for the maximum possible period of time.

The mayors are now invited to give us their comments on the status of their beaches -- any comments that they would like to make regarding proposed projects that they would like to see. I would call first Mayor Knight, who is our host Mayor in the City of Ocean City, Bud.

MAYOR HENRY S. KNIGHT: Thank you very much, Assemblyman. I'd like to thank the Commission for meeting here; after all, it is an apropos site. Ocean City is the only barrier island on the whole East Coast that has had a renourishment from the entire length, north to south. We are a recipient and a participant in the Army Corps plan that goes from our north end jetty down to 36th Street.

This year, for the first time, we entered into an agreement with the State to do from 36th Street to 60th Street. It was one of the projects that Bernie Moore mentioned using some of the money that is not allocated for Army Corps' match to individual projects with the cities and municipalities. Worked out very, very well.

We recently received a brochure from the Army Corps of Engineers. It just proves that renourishment works. During the December storm of 1992, if we hadn't had the renourishment in early 1992, there would have been the estimated damage of our private and public property and our boardwalk of over \$20 million. Renourishment works. It protects our property.

I'd like to also say that we have a great relationship with New Jersey DEP and with our elected officials. We work very hard at that. We have in our audience George Savacano. George just stick your hand up there. George is our Director of Public Works. He is a professional engineer. He was an employee of the Army Corps of Engineers for years when they first did the replenishment here. So we understand where our priorities are, and that's one reason why George is with us, along with his other capabilities: we have a commitment to our beach.

One of the things that I would also like to emphasize is on the mitigation. We work hand in hand with the county and the State. Frank mentioned -- Frank McCall mentioned -- the good relationship that we have on hazard mitigation and it works well. We have our own computer set up with our police communications and our own emergency management. We track our own hurricanes and things like that. We work hand in hand with the county.

One of the other things that we're interested in, and I know it's not within the purview of this particular Commission, but I know that Assemblyman Gibson is interested in it. We are now working on a master plan for dredging our bays and lagoons. We have an unusual situation there because the lagoons are owned by different entities: the State owns some, the city owns some, some are privately owned. So we're working on a master plan to work with New Jersey DEP to expedite that. One of the problems is to find a spoils area.

About the only criticism I have, and I would like some help here, is that we have been having a time getting reimbursed for FEMA projects for 1992 storms. We put the money as anticipated revenues in our budget for 1995. If anybody has any kind of pull, and I'll look around the whole table, (laughter) we certainly would like to be reimbursed for our expenses by the end of 1995 so that we can get them into our budget.

Thank you very much for the opportunity to speak.

ASSEMBLYMAN GIBSON: Thank you, Mayor, you certainly will have our collective pull. If you'll make the specific information or project number known to our offices, we'll make the necessary calls. I think, in cooperation with us, through

the State and the Congressman's Office, maybe we can move things a little bit faster for you.

Were there any questions of Mayor Knight? (no response)

Mayor Fraser is not here. Is his representative Jim Hanley (phonetic spelling) here? (no response)

Then we'll go on to any other mayors that want to address the Commission. (no response)

Meg Smith? Is Meg Smith here?

M E G S M I T H: (off microphone) Yes, I'm here.

ASSEMBLYMAN GIBSON: Meg, I guess we'll call you up next. Not much warning. You're next on my list of people who have asked to have some comments.

MS. SMITH: No, I had not anticipated speaking in public.

ASSEMBLYMAN GIBSON: Just indicated that you would be attending. All right, that's for being here.

Elizabeth Bergus, would you like to address the Commission? Thank you.

E L I Z A B E T H R. B E R G U S: Assemblyman Gibson, I wasn't planning to address the Commission, but I have been listening to these various systems of the sausages.

Some 13, 14 years ago, my husband and I traveled, at our own expense, to Belgium and invited someone from Mr. Moore's Office to come along with us to see what was then referred to as "long guards." I came back with a report and was laughed out of court in Cape May County by them.

Now, what they did was-- We visited the shores of Belgium after a major storm. There had been some five lives

lost in this. These long guards were placed in a gridlike pattern. They weren't just placed as a bulkhead. They were gridded so that the water would wash over and the sand would be deposited. It was true that at times a certain amount of maintenance had to be done.

I do have pictures. I think I'll dust that file off again and possibly send you a copy of my report on that. As I say, it went into the back of my file never to be brought out again when everyone said, "No long guards." But long guards were used improperly. They were used as bulkheads so that you had more erosion rather than -- in the United States they were used as bulkheads, not gridded.

I thought at the time that the way a beach section of Upper Township -- which is not a populated beach particularly -- was a good experimental place for the DEP to try these. I still feel that might be a good area to try long guards. So I will dust my report off. I will get a copy to you and let you look at it. I do have pictures that we took, it was very impressive.

ASSEMBLYMAN GIBSON: Thank you for your comments. We all appreciate your long-term commitment to beach erosion problems in Cape May County and your dedication to that.

I don't know if I have a particular order from now on. It's open to the public, and whoever wants to speak I certainly would invite to come on up here.

Yes, sir. Jim Alexis.

JAMES ALEXIS: Thank you Assemblyman. I'm Jim Alexis from Middle Township. I'm here on behalf of the Township Committee. I think we would be remiss today if we did not bring

about some of the problems that Middle Township is experiencing along the Delaware Bay.

It may be insignificant in the overall picture in the scope of beach erosion within the State and Cape May County, but our Reed's Beach area is becoming more and more vulnerable with each passing high tide and major storm event. Our Public Works Department has almost exhausted its ability to be able to perform and protect the roadway on Reed's Beach. We have severe silting of Bidwell's Creek, which is becoming a navigational hazard.

Bidwell's Creek, as you already know, is becoming a major harbor of refuge for the medium size to small boater. There are two active marinas on the Creek, plus we have some small commercial fisherman with boats in the 35, 40 foot class who frequent those waters to fish the Delaware.

In addition, the beach erosion just north of Reeds Beach on Beach Avenue, which runs parallel with the waterway, has a high tide line within six feet of the roadway. In any major event, the roadway being breached is going to isolate 65 to 70 families, plus whatever boaters are in Bidwell's Creek. They won't be able to exit and get out to any safe area.

Thank you very much.

ASSEMBLYMAN GIBSON: Thanks for those comments, and we are very much aware and will continue to be concerned about the Delaware Bay section as well, particularly Bidwell's ditch. I would comment that the Blue Acres concept, as we were forming that, we did include the Delaware Bay right on up to the area of Salem City. So Blue Acres, in this Green Acres proposal, will apply to the Delaware Bay as well.

Does any of the Commission members or-- Bernie, yes.

MR. MOORE: Mr. Chairman, in response to Mr. Alexis' comments. When we were planning our 1996 budget several years ago, included in there was the repairs to the Bidwell's Creek Jetty. That is one of the projects that we are looking at right now.

Recently, of course, Kilum Associates has gone out and done soil borings which have been very helpful, so that this project could move forward sometime in 1996. That of course, would include the dredging of the channel also at the same time. That jetty that is out there was built back in the 1970s. It has major problems with it, and with the soil boring information that we now have, we are able to go forward with that.

ASSEMBLYMAN GIBSON: Good, glad to hear that, Bernie.

Was the representative of Lower Township prepared to have any comments for the Commission?

E U G E N E A . F O L E Y , C P A : I'm Gene Foley, the Manager of Lower Township. We are particularly interested in the work of the Commission. Of course, we have beachfront on the oceanside and on the bayside, as well as a community that no longer exists in South Cape May, which some years ago was destroyed and has never been rebuilt.

The Township is certainly very interested in doing what we can on the bayside, which is the larger segment of our beach, to protect it. So what you're saying with regard to Blue Acres is of paramount importance to us. We will be listening with eager attention to what you have to say.

ASSEMBLYMAN GIBSON: Thank you for those comments.

Jack Bryson asked to come.

J A C K B R Y S O N: Jack Bryson, Ocean City. Congratulations on your appointment. I think the concern of the public should be recognized here that you folks are here, rather than in Trenton, where you can be heard by the public.

To give you an idea, I hard hat dive; I scuba dive; I have a 65 foot motorboat captain's license for more than six passengers for hire; I was appointed by our Mayor to our Coastal Conservation Commission. So my commitment to our oceans and bays and everything is long-standing.

I just have one concern regarding our offshore fishing reef. It's been there-- There are a couple of films -- let's say video things -- that I'll make available to you. I'll drop them off at your office so you can get a chance to look at it regarding offshore structures.

My concern is here we've dumped cars, trucks, tanks, ships, we've got rubber tires filled with concrete, and the fishing reef. I don't know whether this fishing reef is a planned structure or not. My question is, very simple is, when does a fishing reef become a dump? I don't know if there is anything on there. So if you keep that in mind I'd appreciate it.

Thank you.

ASSEMBLYMAN GIBSON: I appreciate that. We'll try to get an answer. Steve has a response.

MR. KEMPF: No, no, not a response. But I just wanted to touch on hazard mitigation before we close today.

ASSEMBLYMAN GIBSON: Sure.

MR. KEMPF: In response to Mayor Knight, who I certainly agree with your comments, sir, about hazard

mitigation. For those who are not aware of the current structure under the Stafford Act, when there is a disaster, the Stafford Act Section 404 provides for 10 percent of public assistance dollars be utilized after the disaster is closed for hazard mitigation. It's a very, very clumsy process and it puts the horse after the cart.

That has been one of my issues -- I think we discussed this back after the 1992 storm, Mayor, if my memory serves me right-- One that I've been very interested in because it seems to be a backwards way of doing business. However, there seems to be some new thinking coming down the pike about having a separate hazard mitigation program. Funded solely to conduct hazard mitigation studies and implement hazard mitigation practices, but it has not yet been funded.

I have spoken directly to our coastal senators, excuse me Congressmen, Congressmen LoBiondo, Saxton, Smith, and Pallone. I do know that Congressmen Saxton and LoBiondo have looked into providing or drafting some legislation for review to look into changing the old 404 practice. So that instead of waiting, because sometimes a disaster book doesn't close for five years after the disaster, and you don't get your money till then.

Then there's a process after that which may be six, seven, eight years. So it's kind of slow, kind of clumsy, kind of ridiculous. There may be a way, perhaps through this legislation, to open those dollars immediately, so that while you're doing recovery work, you can engage, at the same time, into hazard mitigation, which I think is the way it should be done.

So that's some of the things that are being done, just for your piece of mind, Mayor. I know it's been a long process, but hopefully it's a learning one, and with the help of our legislators, that will come to fruition.

Thank you, Mr. Chairman.

ASSEMBLYMAN GIBSON: Thank you, Steve.

Ken, did you have some remarks that you would like to share with us?

K E N N E T H J. S M I T H: Shy as I am. (laughter)

ASSEMBLYMAN GIBSON: Shy as you are. Last but not least, certainly. Not necessarily last if there is anybody else that wants to talk after you.

MR. SMITH: Let me just say something about the geotubes, not just Jim Caterina's installation but others. We have been very pleasantly surprised along the coast with the effectiveness of them. They are a percentage solution. I think Jim would be the first to admit that, but they have worked very well in Surf City. We had a similar type of installation that held up very well.

Also to echo what Frank McCall said about the difference between the 1962 and 1992. Just to give you a figure, the elevation requirements that FEMA put in reduced damages in V zones along the oceanfront by 83 percent and have saved the National Flood Insurance Program, or the taxpayers actually, about half a billion dollars a year.

I want to just tell you about two initiatives that are most important that are happening in Congress right now and also say that I am pleased that Frank LoBiondo has signed on to the House side of this. These are the coastal representative

coalitions. Senator Bradley and Connie Mack, from Florida, cochair the one in the Senate, and Clay Shaw, from Broward County, in Florida and about 20 other members that have now signed on are doing the same thing in the House. These will constitute a significant voting block, and shore protection is their highest priority. Senator Bradley is looking at some clear water issues, also, but, again, shore protection is the mainstay of these.

I am working with a network of colleagues from around the country and we're very supportive of this. We want to make sure that it doesn't die, because we don't have a coastal policy in Washington. We have catch-as-catch-can and whoever screams the loudest. The economics of the coast and beaches really dictate that we have a policy down there, so we will be moving that along.

I just want to close with a comment. Fourteen years ago, American Shore and Beach Preservation Association started its New Jersey section. We held a conference in Wildwood Crest. Bernie was there. Many people came up from Florida. We were all looking toward Florida with respect for what they had done. They were the guiding light for beach restoration. That situation is somewhat reversed today.

Bernie and I were just down at a conference two weeks ago in Palm Beach given by the Florida Shore and Beach Preservation Association. While we have an \$18 million shore protection fund in New Jersey, Florida's Governor vetoed all their shore protection money last year and was not overridden by the legislature. How that happened, I don't know. But I can

tell you that it's caused a lot of consternation down there with 85 percent of their people at the coast.

So I think it's to all of our credit, everybody that worked to get that fund together and to keep it going, that we do have a fund, and now we're commanding the respect of neighboring states.

That's it.

ASSEMBLYMAN GIBSON: Thank you very much, Ken.

MR. SMITH: Thanks.

ASSEMBLYMAN GIBSON: Florida has beautiful winter weather and that's their attraction. Our attraction is our beaches. They have to be maintained as Steve said, and they have to be protected.

I think it's an appropriate time to read into the record the letter that the Congressman has provided us for today's Commission hearing. It's addressed to me, and it goes on to say, "The New Jersey coastline is one of the State's greatest assets, attracting visitors from around the world and producing more than \$18 billion annually for the State.

"Since tourism is one of the State's largest industries, it has become vitally important for the government to take an active part in making sure the shore remains a prime attraction.

"The government's role should be a partnership between Federal, State, county, and local governments. At the Federal level, I am fighting to assure funding continues.

"Earlier this year, I testified before the House Subcommittee on Energy and Water Development Appropriations that cutting beach protection and other maintenance projects would

have nationwide repercussions. The House voted to keep beach protection funds and continue the Corps of Engineers' 50-year maintenance plan for New Jersey's beaches.

"This commitment, along with the commitment from the State of New Jersey, has insured strong protection for the State's beaches. I know that with a continued commitment from all levels of government our beaches will continue to help provide a better quality of life for all New Jersey residents.

"Sincerely, Frank A. LoBiondo, Member of Congress."

This will be included in the record of today's testimony.

Is there anyone else that has any comments?

Yes, sir.

BRYAN DICKERSON: Thank you for hearing me speak. My name is Bryan Dickerson from the Township of Brick. Our two miles of ocean beaches are scheduled as part of the Corps' recon phase from Manasquan to Barnegat. In light of the court termination -- halting I should say, the projects on Long Beach Island, Delaware, and on Long Island, we're worried that our project will be halted after the recon phase as well.

Thank you for hearing me.

ASSEMBLYMAN GIBSON: Bernie will comment on that, sir.

MR. MOORE: The recon has been started or will be started in Fiscal 1996. We are very confident that the study will continue on into the feasibility. In this year, the only area that was not going to be continued was the area from Barnegat to Little Egg Harbor Inlet.

However, our congressional delegation pushed for the added funds. That is still in the budget as it goes to the

committee, and we expect to move on that into the feasibility stage. So we are confident that between the State support and the congressional support we have had that all of the funds will be provided for the necessary studies and also the construction.

ASSEMBLYMAN GIBSON: Okay I'll close the hearing to members of the public. I do have some closing remarks and perhaps my colleagues may as well.

Yes, sir, I'm sorry.

J A M E S R O N E Y: Thank you, Mr Chairman. My name is Jim Roney. I'm one of the Borough Commissioners from the beautiful Borough of West Cape May. I'm here to represent his Honor, Mayor Jack Vassar, who could not make it today.

I would just like to say to the members of this auspicious Commission, if that's the right word, you have our undying support. I think the job you are doing is just extremely commendable. So thank you so much, and whatever support we can give you, you sure can count on it.

Thank you very much for listening

ASSEMBLYMAN GIBSON: Thank you, Commissioner. It's a two-way street, so you have ours as well.

Any others? (no response)

What we have been doing through the summer, and since we have had some brushes with hurricanes -- fortunately they were only brushes -- is to hear from our local officials as to some of the projects they would like to have started, but there is, always, a priority and limitation of funds.

This year the Legislature was able to raise the dedicated amount that comes from the Realty Transfer Tax from \$15 million to \$18 million. We have made a study of the funds

that are coming into the Realty Transfer Tax to see whether we could develop an argument for our colleagues in the Legislature that there is need and a resource to provide additional funds for beach erosion. There certainly is need.

Assistant Commissioner Bernie Moore, indicated that when the announcement that there would be \$3 million available for Fiscal 1996 that he got applications and requests in the neighborhood of \$10 million.

From what we have heard, based on the attention that we have given on these recent storms -- which, by the way, were not as serious as originally had been expected. Our beaches held up very well. Our beaches for the most part, although they may not be formally, they are in fact engineered beaches. The municipal officials, the State of New Jersey, the Federal commitment has done an excellent job in New Jersey and we expect that to continue.

But as far as a fiscal report, when we first provided funds for dedicated beach revenue the year before that was considered, there was \$32 million coming in into this area of the Realty Transfer Tax. The year we enacted dedicated revenue in the State Legislature -- the first time in many, many years -- we finally arrived at and achieved dedicated revenue for beach erosion. That increased to \$35 million; in 1993 it went to \$37 million; in 1994, \$43.9 million; and in 1995, receipts reached \$44.3 million. This year, we've taken \$18 million out of that fund, the balance goes toward the General Fund.

I believe there is a justification because of the steady growth in that fund for increased moneys for beach erosion based on the priority the Department of Environmental

Protection will send to the Legislature as to what their recommendations are. This Commission will be making that recommendation, and the entire Legislature will be listening to the recommendations that this Commission makes.

I thank you for your attendance. I would ask my colleagues if they have anything to add to that. We'll be glad to hear from them.

ASSEMBLYMAN ASSELTA: I think Assemblyman Gibson has really put forth our position in the future on this matter. I think we are going to be totally supportive, Assemblyman Blee and myself, as to increasing that funding.

I would just also like to add that the tourism dollars that are taken in by this State have exceeded \$18 billion or are probably over \$20 billion this year and how valuable that particular business is to the State of New Jersey. It's very important to us to maintain our beaches, and to keep people coming down here is highly critical for the economy in New Jersey, and I will be fighting for that continually.

Thank you.

ASSEMBLYMAN GIBSON: Thank you, Assemblyman.

Assemblyman Blee, any comments?

ASSEMBLYMAN BLEE: Just very briefly. To reconfirm what Assemblyman Asselta just said. This is a very, very important aspect of Atlantic County, and I would, again, just like to give you my assurances that I will be side by side with your legislative team fighting to see that this funding stays in place and that increased funding can be made available in the future.

I spend a lot of time on the beach in the summer, myself. This is very, very near and dear to my heart. It's been a thrill to be here today. It's been very, very informative for me. I look forward to working with your team in the future.

ASSEMBLYMAN GIBSON: Thank you, Assemblyman.

All right, I'll close the hearing. Thank you all for your attendance and your participation.

(MEETING CONCLUDED)

APPENDIX

DIVISION OF ENGINEERING AND CONSTRUCTION - SHORE PROTECTION

AREA/PROJECT	CATEGORY	FUNDING SOURCE	FY 97		FY 98		FY 99	
			REQUEST	O & M COST REVENUE INCREASE	REQUEST	O & M COST REVENUE INCREASE	REQUEST	O & M COST REVENUE INCREASE
Sea Isle City Groins	U PUBLIC PURPOSE	SPF	\$ 900,000		\$ 900,000			
		LOCAL	\$ 300,000		300,000			
Beachfill	U PUBLIC PURPOSE	SPF			\$ 750,000			
		LOCAL			\$ 250,000			
Barge Bulkhead	N PUBLIC PURPOSE	SPF			\$ 750,000			
		LOCAL			\$ 250,000			
Seaside Heights Beachfill	N PUBLIC PURPOSE	SPF					\$1,350,000	
		LOCAL					\$ 450,000	
Seaside Beachfill	N PUBLIC PURPOSE	SPF					\$1,500,000	
		LOCAL					\$ 500,000	
Dune Repair	N PUBLIC PURPOSE	SPF					\$ 600,000	
		LOCAL					\$ 200,000	
SUB-TOTAL			\$1,200,000		\$3,200,000		\$4,600,000	
			\$ 900,000		\$2,400,000		\$3,450,000	
			\$ 300,000		\$ 800,000		\$1,150,000	

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11

I=URGENT N=NECESSARY D=DESIRED

DIVISION OF ENGINEERING AND CONSTRUCTION - SHORE PROTECTION

AREA/PROJECT	CATEGORY	FUNDING SOURCE	FY 97		FY 98		FY 99		
			REQUEST	O & M COST REVENUE INCREASE	REQUEST	O & M COST REVENUE INCREASE	REQUEST	O & M COST REVENUE INCREASE	
IR-6 PROJECTS									
S ARMY STUDIES Feasibility Studies	U PUBLIC PURPOSE	SPF	\$ 2,653,000		\$ 2,043,000		\$1,177,000		
		FEDERAL	\$ 2,653,000		\$ 2,043,000		\$1,177,000		
Deal to Asbury Park beachfill	U PUBLIC PURPOSE	SPF	\$ 7,500,000						
		LOCAL	\$ 2,500,000						
		FEDERAL	\$10,000,000						
Ocean City beachfill	N PUBLIC PURPOSE	SPF			\$ 3,100,000				
		LOCAL			\$ 1,000,000				
		FEDERAL			\$ 7,600,000				
Posecon Island beachfill	U PUBLIC PURPOSE				\$ 6,750,000		\$3,400,000		
					\$ 2,250,000		\$1,100,000		
					\$15,000,000		\$9,000,000		
Peape May City beachfill	N PUBLIC PURPOSE	SPF			\$ 150,000				
		LOCAL			\$ 50,000				
		FEDERAL			\$ 1,800,000				
Asbury Park/Avon beachfill	U PUBLIC PURPOSE	SPF	\$ 6,200,000						
		LOCAL	\$ 2,100,000						
		FEDERAL	\$15,400,000						
NEMA SHORELINE MONITORING	U PUBLIC PURPOSE	SPF	\$ 100,000		\$ 110,000		\$ 130,000		
		LOCAL							
		FEDERAL							
Wansends Inlet Peape May Inlet beachfill	U PUBLIC PURPOSE	SPF	\$ 750,000				\$ 3,900,000		
		LOCAL	\$ 250,000				\$ 1,300,000		
		FEDERAL					\$10,000,000		
City of Newark beachhead	N PUBLIC PURPOSE	SPF			\$ 3,000,000		\$ 3,000,000		
		LOCAL			\$ 1,000,000		\$ 1,000,000		
		FEDERAL			\$12,000,000		\$12,000,000		

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DIVISION OF ENGINEERING AND CONSTRUCTION - SHORE PROTECTION

AREA/PROJECT	CATEGORY	FUNDING SOURCE	FY 97 REQUEST	O & M COST REVENUE INCREASE	FY 98 REQUEST	O & M COST REVENUE INCREASE	FY 99 REQUEST	O & M COST REVENUE INCREASE
Administration	U PUBLIC PURPOSE	SPF	\$ 1,400,000		\$ 1,500,000		\$ 1,600,000	
..R. 6 SUB TOTAL			\$50,506,000		\$59,396,000		\$48,784,000	
		SPF	\$17,853,000		\$16,653,000		\$13,207,000	
		LOCAL	\$ 4,600,000		\$ 4,300,000		\$ 3,400,000	
		FEDERAL	\$28,053,000		\$38,443,000		\$32,177,000	
GRAND TOTAL Shore Protection			\$18,753,000		\$19,053,000		\$16,657,000	
		LOCAL	\$ 4,900,000		\$ 5,100,000		\$ 4,550,000	
		FEDERAL	\$28,053,000		\$38,443,000		\$32,177,000	
			\$51,706,000		\$62,596,000		\$53,384,000	

=URGENT N=NECESSARY D=DESIRED

New Jersey State Library

3X

U S ARMY - STATE - LOCAL SHORE PROTECTION PROJECTS

STATES AND ESTIMATED FUNDING REQUIRED

AREA	ACTION	FEDERAL	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05
RARITAN BAY GENERAL	RECONR.	FEDERAL	\$600,000.00									
	FEAS.	FEDERAL STATE		\$390,000.00 \$390,000.00	\$440,000.00 \$440,000.00	\$270,000.00 \$270,000.00	\$250,000.00 \$250,000.00	\$70,000.00 \$70,000.00				
RARITAN BAY CLIFFWOOD BEACH	RECONR.	FEDERAL	\$50,000.00									
	FEAS.	FEDERAL STATE		\$250,000.00 \$250,000.00	\$300,000.00 \$300,000.00	\$250,000.00 \$250,000.00						
RARITAN BAY (BOYD STUDIES COMBINED)	CONSTR.	FEDERAL STATE LOCAL					\$6,500,000.00 \$2,500,000.00 \$900,000.00	\$6,500,000.00 \$2,600,000.00 \$900,000.00	\$6,500,000.00 \$2,600,000.00 \$900,000.00	\$6,500,000.00 \$2,600,000.00 \$900,000.00	\$6,500,000.00 \$2,600,000.00 \$900,000.00	
	SEA BRIGHT NORMOUTH BEACH	CONSTR.	FEDERAL STATE LOCAL					\$21,400,000.00 \$8,700,000.00 \$2,900,000.00				
LONG BRANCH	CONSTR.	FEDERAL STATE LOCAL	\$9,600,000.00 \$3,900,000.00 \$1,300,000.00					\$7,200,000.00 \$2,900,000.00 \$900,000.00				
	DEAL TO ASBURY	CONSTR.	FEDERAL STATE LOCAL	\$10,000,000.00 \$7,500,000.00 \$2,500,000.00					\$7,000,000.00 \$2,800,000.00 \$900,000.00			
ASBURY TO AVON	CONSTR.	FEDERAL STATE LOCAL	\$15,400,000.00 \$6,200,000.00 \$2,100,000.00						\$7,000,000.00 \$2,800,000.00 \$900,000.00			
	BELMAR TO MANASQUAN	CONSTR.	FEDERAL STATE LOCAL	\$15,400,000.00 \$6,200,000.00 \$2,100,000.00					\$7,200,000.00 \$2,900,000.00 \$900,000.00			
MANASQUAN INLET TO BARNEGAT INLET	RECONR.	FEDERAL	\$290,000.00									
	FEAS.	FEDERAL STATE		\$550,000.00 \$550,000.00	\$400,000.00 \$400,000.00	\$275,000.00 \$275,000.00	\$25,000.00 \$25,000.00					
BARNEGAT INLET TO LITTLE EGG INLET	CONSTR.	FEDERAL STATE LOCAL						\$1,500,000.00 \$5,200,000.00 \$1,700,000.00	\$12,000,000.00 \$5,200,000.00 \$1,700,000.00	\$8,000,000.00 \$3,500,000.00 \$1,200,000.00		
	FEAS.	FEDERAL STATE	\$500,000.00 \$500,000.00	\$400,000.00 \$400,000.00	\$275,000.00 \$275,000.00	\$25,000.00 \$25,000.00						
BARNEGAT INLET TO LITTLE EGG INLET	CONSTR.	FEDERAL STATE					\$1,200,000.00 \$1,500,000.00	\$15,200,000.00 \$3,700,000.00	\$9,000,000.00 \$1,700,000.00			\$6,500,000.00 \$2,600,000.00 \$900,000.00

45

U S ARMY - STATE - LOCAL SHORE PROTECTOR PROJECTS

STATUS AND ESTIMATED FUNDING REQUIRED

AREA	ACTION		PY 86	PY 87	PY 88	PY 89	PY 90	PY 91	PY 92	PY 93	PY 94	PY 95
BRIGANTINE INLET TO GREAT EGG INLET (INCLUDES ABSCON, BRIGANTINE ISLAND)	FEAS.	FEDERAL	\$115,000.00	\$100,000.00	\$70,000.00	\$32,000.00						
		STATE	\$151,000.00	\$153,000.00	\$19,000.00	\$16,000.00						
ABSCON ISLAND	CONSTR.	FEDERAL		\$1,000,000.00	\$15,000,000.00	\$9,200,000.00				\$6,500,000.00		\$6,500,000.00
		STATE			\$6,750,000.00	\$1,400,000.00				\$2,600,000.00		\$2,600,000.00
		LOCAL			\$2,250,000.00	\$1,100,000.00				\$900,000.00		\$900,000.00
BRIGANTINE ISLAND	CONSTR.	FEDERAL				\$1,000,000.00	\$5,850,000.00	\$4,200,000.00			\$5,200,000.00	
		STATE					\$2,800,000.00	\$1,600,000.00			\$1,300,000.00	
		LOCAL					\$900,000.00	\$600,000.00			\$500,000.00	
OCEAN CITY	CONSTR.	FEDERAL			\$7,600,000.00			\$7,600,000.00			\$7,600,000.00	
		STATE			\$3,100,000.00			\$3,100,000.00			\$3,100,000.00	
		LOCAL			\$1,000,000.00			\$1,000,000.00			\$1,000,000.00	
GREAT EGG HARBOR TO TOWNSEDS INLET	FEAS.	FEDERAL	\$290,000.00									
		STATE		\$550,000.00	\$400,000.00	\$275,000.00	\$25,000.00					
	CONSTR.			\$550,000.00	\$400,000.00	\$275,000.00	\$25,000.00	\$600,000.00	\$8,000,000.00	\$5,000,000.00		
TOWNSEDS INLET TO CAPE MAY INLET	CONSTR.	FEDERAL			\$1,000,000.00	\$10,000,000.00	\$6,000,000.00				\$3,900,000.00	
		STATE	\$80,000.00	\$41,000.00		\$3,900,000.00	\$3,000,000.00				\$1,600,000.00	
		LOCAL	\$119,000.00	\$59,000.00		\$1,300,000.00	\$1,000,000.00				\$500,000.00	
CAPE MAY HEADONS TO CAPE MAY POINT	FEAS.	FEDERAL	\$350,000.00	\$140,000.00	\$34,000.00	\$20,000.00						
		STATE	\$275,000.00	\$73,000.00	\$40,000.00	\$20,000.00						
	CONSTR.				\$120,000.00	\$8,000,000.00	\$1,100,000.00	\$400,000.00	\$825,000.00	\$206,000.00	\$69,000.00	\$825,000.00
DELAWARE BAY CAPE MAY POINT TO HAURICK RIVER	CONSTR.	FEDERAL			\$200,000.00	\$200,000.00	\$600,000.00	\$1,600,000.00				
		STATE	\$440,000.00	\$232,000.00	\$124,000.00	\$30,000.00	\$375,000.00	\$1,200,000.00				
		LOCAL	\$595,000.00	\$277,000.00	\$108,000.00	\$97,000.00	\$125,000.00	\$400,000.00				

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U S ARMY - STATE - LOCAL SHORE PROTECTION PROJECTS

STATUS AND ESTIMATED FISCAL YEAR REQUIRED

AREA	ACTION		FY 96	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05
CAPE MAY VILLAGES AREA	CONSTR.	FEDERAL			\$100,000.00	\$200,000.00	\$200,000.00	\$2,400,000.00	\$2,300,000.00			\$975,000.00
		STATE						\$1,125,000.00	\$975,000.00			\$394,000.00
		LOCAL						\$375,000.00	\$325,000.00			\$131,000.00
REEDS BRANCH TO PIRCHES POINT	CONSTR.	FEDERAL				\$100,000.00	\$200,000.00	\$200,000.00	\$650,000.00	\$800,000.00		
		STATE							\$487,000.00	\$300,000.00		
		LOCAL							\$163,000.00	\$100,000.00		
TOTALS		FEDERAL	\$27,737,000.00	\$29,053,000.00	\$25,943,000.00	\$21,797,000.00	\$25,150,000.00	\$75,472,000.00	\$59,775,000.00	\$24,200,000.00	\$10,125,000.00	\$13,975,000.00
		STATE	\$11,650,000.00	\$16,402,000.00	\$11,832,000.00	\$8,528,000.00	\$10,175,000.00	\$29,497,000.00	\$24,568,000.00	\$10,100,000.00	\$7,206,000.00	\$5,594,000.00
		LOCAL	\$3,400,000.00	\$4,600,000.00	\$3,250,000.00	\$2,400,000.00	\$3,325,000.00	\$9,775,000.00	\$8,057,000.00	\$3,400,000.00	\$2,469,000.00	\$1,931,000.00

RECON - RECONNAISSANCE
 PRAS - FEASIBILITY
 CONSTR - CONSTRUCTION

6X

STABLE VS FEDERAL FUNDS

(\$ MILLIONS)

FISCAL	FEDERAL	STATE	LOCAL	TOTAL
94	1.7	1.7	-0-	3.4
95	10.7	4.6	-0-	15.3
96	27.7	11.6	3.4	42.7
97	28.0	16.5	4.6	49.1
98	38.4	15.0	4.3	57.7
99	32.2	11.6	3.4	47.2
00	25.1	10.2	3.3	38.6

7X

Mitigation

By. Mr. Anthony S. Mangeri
State Hazard Mitigation Officer

Hazard mitigation must be a locally driven initiative but there is assistance available for local officials to develop mitigation policies and set up hazard mitigation programs.

The State Hazard Mitigation Team has been very busy reviewing local and county applications for hazard mitigation assistance. The team has also been called upon to provide technical assistance to jurisdictions developing local mitigation programs.

To date, the Team has reviewed more than 167 applications for the Hazard Mitigation Grant Program and has recommended that 39 projects be funded by the Federal Emergency Management Agency.

Most of the available \$2.2 Million was used to fund structural mitigation projects such as a concrete reef and geotextile tubes designed to diffuse wave action and retain sand along New Jersey's shoreline.

Many of the projects are designed to enhance local residents knowledge of natural hazards in their communities. Cape May County residents will be receiving booklets which contain information on floods, northeastern coastal storms and hurricanes.

Information will include emergency action steps and general preparedness information for residents and visitors. Road maps defining evacuation routes and shelter locations will be designed for those visiting the County during the summer season. Once the grant is approved by FEMA, the booklet will be available in French and English.

As a condition of the grant, the Cape May County Freeholder Board will be asked to pass a resolution calling for one of these books to be placed in all seasonal rental properties.

FEMA has approved 13 of the recommended projects. The remaining projects are awaiting environmental assessments and further federal review.

Once approved all project applicants will be required to develop a hazard mitigation plan for their communities. The purpose of the plan is to tie mitigation projects and activities of various agencies together towards a common plan. The State Hazard Mitigation Team will be conducting workshops on developing mitigation strategies and planning.

In addition to the projects funded under the Hazard Mitigation Grant Program, the Team has been working with other agencies to develop state level natural hazard risk reduction strategies and policies. These agencies include the Departments of Community Affairs, Environmental Protection and Transportation.

The Department of Transportation has funded a major project to provide back bay tide level telemetry. Tidal monitors and rain gages will be placed in more than 30 back bay and coastal waterway locations from Cape May County to Monmouth County.

This system will be connected to the current IFLOWS system and will be used by the emergency management community to assess back bay inundation during coastal storms. DOT will also use the data to determine proper elevation for causeways and critical evacuation routes in the coastal areas.

The Mitigation Team is also involved in research. Recently Rutgers University, Institute of Marine and Coastal Sciences was awarded a \$40,000 grant to conduct research to establish baseline vulnerability data for existing coastal development.

The project also calls for the institute to develop an educational package on coastal vulnerability. The educational package can be used by local emergency managers to educate local officials or by educators to supplement natural science curriculum.

The State Hazard Mitigation Team is in the process of reviewing several new pieces of legislation that will greatly impact upon the State's mitigation program and make pre-event funds available for New Jersey's municipalities.

The National Flood Insurance Program has been revised. Under the new law, monies will be available for state and local natural hazard mitigation projects. Regulations for the grants have not yet been issued by FEMA but are expected in September.

A second major legislative change has been an attempt to rewrite the Robert T. Stafford Act, P.L. 93-288. The changes would create a Natural Hazard Insurance Corporation to provide insurance for residents in high hazard areas.

The revision would also make a minimum of \$250,000 available to states if they are in compliance with the requirements of the new regulations. At this point, the rewrite has not yet been sponsored in Congress but the Team is working hard to review and determine the impacts of such new legislation.

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- 1 **State of New Jersey
Office Of Emergency Management
State Hazard Mitigation Program**
 - State Hazard Mitigation Team formalized by Executive Order 115, January 1994
 - State Hazard Mitigation Plan, Revised 1992
 - Administer post-disaster Hazard Mitigation Grant program
 - Provide technical assistance to county & local governments in developing risk reduction strategies, programs and projects
- 2 **What is Hazard Mitigation?**
 - Actions, programs and policies intended to reduce or eliminate the risk or vulnerability to Natural hazards
 - Structural and non-structural in nature
 - Designed to break the cycle of damage, reconstruction, damage, reconstruction
- 3 **Why is Mitigation Important to New Jersey?**
 - Reduction of property damage & economic losses
 - Lives saved and injuries reduced
 - Critical facilities kept functioning
 - Reduced legal and social liability of government and public officials
 - physical and mental health unaffected
 - Manufacturing and agricultural production remain unimpaired
 - Positive political ramifications
- 4 **Why is Mitigation Important to New Jersey?**
 - Courts are tending to find local governments liable for negligent actions which result in hazard related losses to property owners including:
 - Negligent maintenance of sewers, storm drains, dams, etc. which result in private loss
 - Failure to adequately enforce provisions of construction Code including National Flood Insurance requirements
 - Public construction which increases private losses
- 5 **Accomplishing Mitigation
Local Initiatives**
 - Preventing or limiting development in hazard prone areas
 - Land-use regulations
 - Zoning ordinances
 - Land Acquisition
 - Altering design or construction to reduce hazard vulnerability
 - Building codes
 - Subdivision regulations
 - Public Health regulations
 - Adapting to the hazard
- 6 **Accomplishing Mitigation
Local Initiatives**
 - Structural Measures To shield people and property
 - Public works program
 - structural
 - land treatment
 - Voluntary incentives

- Public Education/Public Awareness
 - orienting the public to natural hazard vulnerability
 - workshops, lectures and presentations
 - publications, pamphlet, inserts
 - Hazard zone mapping
 - Home inspections

7 Local Opportunities for Hazard Mitigation

- Identifying the Need
 - Identify the hazards
 - Determine risk & vulnerability
- Developing a Hazard Mitigation Strategy
 - Determine acceptable risk reduction goals, policies and tools to reduce human and property loss from natural hazards
 - Seek public involvement to determine what is acceptable risk and what measures are acceptable to the community as a whole
 - Goals and Objectives are to be developed by agencies involved in the planning process

8 Local Opportunities for Hazard Mitigation

- Identify a Range of Alternative Measures
 - Consider existing capabilities
 - Build a consensus in the community
 - Select a set of criteria to judge proposed measures
- Corrective Measures
 - Acquisition - Public control of developed properties that are vulnerable to damage
 - Purchase at full market value
 - Purchase through foreclosure, tax-delinquent property, bargain sale, purchase and lease back
 - Donations; by will, through reserved real estate
 - Relocation - Permanent evacuation of hazard-prone areas to a safer area

9 Local Opportunities for Hazard Mitigation

- Corrective Measures Cont'd
 - Redevelopment or renewal - Rebuilding damaged areas in a way that future damages are reduced and economic viability is improved
 - Building Modifications - Making existing structures more resistant to damage through retrofitting
 - Public Works Measures - Engineering measures used to contain or redirect natural hazards away from development
 - Structural Measures - Dams, Reservoirs, Dikes, Levees, Seawalls, Bulkheads, High Flow Diversion, Spillways, Retaining Wall

10 Local Opportunities for Hazard Mitigation

- Corrective Measures Cont'd
 - Land treatment - Reestablishing vegetative cover, contour plowing, grading, soil stabilization
 - Planning & Regulatory Measures - Land-use planning, zoning, subdivision regulations, environmental regulations, building, housing & sanitary codes, space planning, disclosure acts, transfer of development rights, open space planning
 - Public Education - workshops, seminars, publications hazard mapping, site inspections

11 Funding Hazard Mitigation

- National flood Insurance Mitigation Fund (Section V)
 - signed in September 1994 regulations to be published by FEMA
 - \$10 Million in 1994, \$15 Million in 1995 and \$20 Million per year thereafter
 - Repealed Upton Jones & Sect. 1362 Buyout Program
 - Penalty for those who are eligible but fail to maintain flood insurance

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12 **Funding Hazard Mitigation**

- **Hazard Mitigation Grant Program**
 - Funds are currently available through the State Office of Emergency Management
 - Must benefit or be located in a presidentially declared disaster area
 - Not to be used for equipment purchases or planning
- **Sponsorships & Free services**
 - Name Visibility
- **Foundation Grants & Fellowships**
- **Non-profit development**
- **Deals & Donations**

Hazard Mitigation

This brochure is designed to answer common questions about the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program.

What is the Hazard Mitigation Grant Program?

The Hazard Mitigation Grant Program (HMGP) was created in November 1988, by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The HMGP assists States and local communities in implementing long-term hazard mitigation measures following a major disaster declaration. In December 1993, the President signed the Hazard Mitigation and Relocation Assistance Act which amends Section 404 to increase Federal funding of HMGP projects to 75 percent of the project's total eligible costs. For disasters declared before June 10, 1993, the Federal share for the program is 50 percent.

What is the Hazard Mitigation Grant Program?

The Program's objectives are:

- To prevent future losses of lives and property due to disasters;
- To implement State or local Hazard Mitigation plans;
- To enable mitigation measures to be implemented during immediate recovery from a disaster; and
- To provide funding for previously identified mitigation measures that benefit the disaster area.

Who is eligible?

Applicant eligibility is the same for the Hazard Mitigation Grant Program as it is for the Public Assistance Program. Applicants who are eligible for the HMGP are:

- State and local governments;
- Certain private non-profit organizations or institutions; and
- Indian tribes or authorized tribal organizations and Alaska Native villages or organizations.

What types of projects can be funded?

The HMGP can be used to fund projects to protect either public or private property. Examples of projects include:

- Structural hazard control, such as debris basins or floodwalls;
- Retrofitting, such as floodproofing to protect structures from future damage;
- Acquisition and relocation of structures from hazard-prone areas; and
- Development of State or local standards to protect new and substantially improved structures from disaster damage.

How do I apply?

Eligible applicants must apply for the Hazard Mitigation Grant Program through the State, since the State is responsible for administering the Program. The applicant should contact the State Hazard Mitigation Officer for specific details. Every State must develop a Hazard Mitigation Administrative Plan that explains the State's procedures for administering the HMGP.

What is the deadline for applying for funds?

The State must submit a letter of intent to FEMA to participate in the HMGP within 60 days of the disaster declaration. Applications for mitigation projects are encouraged as soon as possible after the disaster occurs so that opportunities to do mitigation are not lost during reconstruction. All new project proposals must be submitted for approval within 90 days after FEMA approves the State's hazard mitigation plan for the disaster.

You should contact your State Hazard Mitigation Officer for specific application dates.

How much money is available in the HMGP?

FEMA can fund up to 75% of the eligible costs of each project. The State or local match does not need to be cash; in-kind services or materials may be used. With the passage of the Hazard Mitigation and Relocation Assistance Act of 1993, Federal funding under the HMGP is now based on 15% of the Federal funds spent on the Public and Individual Assistance programs (minus administrative expenses) for each disaster.

How are potential projects identified and selected for funding?

The State's administrative plan governs how projects are selected for funding. However, proposed projects must meet certain minimum criteria. These criteria are designed to ensure that the most cost-effective and appropriate projects are selected for funding. Both the law and the regulations require that the projects are part of an overall mitigation strategy for the disaster area.

How does the HMGP differ from mitigation funded under the Public Assistance Program?

Mitigation projects may also be identified and funded through FEMA's Public Assistance Program after a disaster declaration. Public Assistance funds allow an existing damaged facility to incorporate mitigation measures during repairs, if the measures are cost-effective or are required by code. These potential measures can be identified by either FEMA, the State, or the local applicant.

Mitigation funded under Public Assistance is only for public facilities damaged by the disaster. The HMGP can fund mitigation measures to protect public or private property, so long as these measures fit within the overall mitigation strategy for the disaster area, and comply with program guidelines. For public property damaged in the disaster, it is more appropriate to fund mitigation measures under Section 406 before applying for the HMGP.

Where can I obtain further information?

Regulations for the HMGP are published in Title 44 of the Code of Federal Regulations, Part 206, Subpart N. Detailed information about applying and managing the Program can be found in FEMA's HMGP Interim Guidance handbook.

For copies of the handbook or further information, contact your State Hazard Mitigation Officer or FEMA Mitigation Division in your Region. A list of FEMA's Regional Offices is printed on the back of this brochure.

17X

EXECUTIVE ORDER NO. 115

WHEREAS, various natural hazards have caused physical and financial impact in New Jersey and will continue to do so and these impacts have resulted in unexpected costs to county and local governments as well as degradation of the State's health, safety, environment, infrastructure and economy, and

Whereas, the opportunities to significantly mitigate the impacts of coastal storms, hurricanes, floods, wildfires, earthquakes, and other natural hazards are identifiable and should be executed as funding is available; and

Whereas, there exist the skills, expertise, and talent within the Executive Branch departments and independent authorities to examine and make recommendations to reduce the vulnerability of New Jersey's citizens and property; and

WHEREAS, Executive Order No. 12 (1970-Cahill) and Executive Order No. 39 (1954-Meyner) directs State agencies to fully participate in the emergency management system: and

WHEREAS, the Office of Emergency Management in the Department of Law and Public Safety is charged with the responsibility to administer the State's comprehensive emergency management programs; and

WHEREAS, the Governor's Advisory Council on Emergency Services is empowered to authorize expenditures from the Governor's Emergency Services Fund, upon approval of the Governor, to provide relief from an emergency; and

WHEREAS, a need exists to provide formal recognition, authority and responsibility to this organizational structure;

NOW, THEREFORE, I JAMES J. FLORIO, Governor of the State of New Jersey, by virtue of the authority vested in me by the Constitution and by the Statutes of this State, do hereby ORDER and DIRECT:

1. An interagency State Hazard Mitigation Team (SHMT) is established. A representative of the Office of the Governor will chair the Team and the State Hazard Mitigation Officer appointed by the Governor for the most recent Presidential Disaster Declaration, pursuant to federal law, shall serve as Deputy Chair.

2. In addition to the Chair and Deputy Chair, the team shall consist of the following members or their designees, with the ability to add other participants as appropriate:

A. Department of Community Affairs

Assistant Director Codes and Standards.

Representative, Division of Fire Safety.

B. Department of Education:

Emergency Coordinator.

C. Department of Environmental Protection and Energy:

Supervisor of Land-Use Regulations.

State Floodplain Management Coordinator.

State Forest Fire Warden.

D. Department of Insurance:

State Ombudsman.

E. Department of Transportation

Director of Roadway Design.

F. Department of Treasury:

Representative, Office of Statewide Planning.

Representative, Office of Management and Budget.

G. Department of Law and Public Safety:

Representative, Office of the Attorney General.

Representative, Office of Emergency Management.

All participants shall be prepared to evaluate hazard mitigation initiatives based on current agency policies and programs.

3. The activities of the team shall be coordinated by a steering committee consisting of the Chair and the Deputy Chair, Assistant Director of Codes and Standards, Director of Roadway Design, State Floodplain Management Coordinator, Supervisor of Land Use Regulation, the Representative of the Office of the Attorney General, and the Representative of the State Office of Emergency Management.

4. The SHMT shall develop a systematic program to identify hazards, monitor changes in hazard vulnerability and implement measures for reducing potential damage by providing a mechanism for follow-up activities crucial to the successful implementation of team recommendations.

5. The SHMT shall develop and maintain a comprehensive plan for the reduction of natural hazards. The team shall review and update this document as deemed necessary.

6. The SHMT shall work to increase the public's awareness of the risk associated with known hazards and promote preparedness among residents of the State.

7. The SHMT shall meet at the call of the Chair, but not less frequently than twice a year.

8. The SHMT shall serve as an advisory group to the Governor's Advisory Council on Emergency Services (GACES) and shall prepare post-disaster hazard mitigation recommendations for all applications for assistance.

9. GACES shall review and approve such recommendations based on their expected effectiveness in reducing the threat to the health, safety and property of the citizens of New Jersey.

10. The SHMT shall investigate and recommend cost-effective hazard mitigation opportunities to the Office of Emergency Services as part of any disaster recovery effort.

11. The SHMT shall prepare and submit to the Office of Emergency Management an annual work program which shall contain a budgetary needs statement. The team shall provide to the State Director an annual status report covering progress achieved through team activities.

12. This Order shall take effect immediately.

GIVEN, under my hand and seal
this 14th day of Jan.
in the Year of Our Lord, One
Thousand Nine Hundred and
Ninety Four, and of the
Independence of the United
States, the Two Hundred and
Eighteenth

/s/ Jim Florio
Governor

Attest:

/s/ S.W.
Chief Counsel to the Governor

21X



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Solution: Geotubes

Application: Sand Dunes
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Breakwaters
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Sincerely,

James Caterina
president

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THIS PROJECT IS ADVERTISED ON AN UNRESTRICTED BASIS PURSUANT TO
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Solicitation No. DACW01-92-B-0007

SPECIFICATIONS
FOR
MAINTENANCE DREDGING
OF THE
THEODORE SHIP CHANNEL
AND
MOBILE NAVY HOMEPORT
AT
MOBILE HARBOR, ALABAMA

OF-0

118

THIS IS A CIVIL WORKS PROGRAM PROCUREMENT AND IS NOT FUNDED BY
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"GOOD ENGINEERING RESULTS IN A BETTER ENVIRONMENT"

U. S. ARMY ENGINEER DISTRICT, MOBILE
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Mobile, Alabama



38X

SECTION 2C

GEOTUBE DIKE DEMONSTRATION

Index

- | | |
|-----------------------------------|--------------------------------|
| 1. Work Covered by Contract Price | 5. Contractor Supervision |
| 2. Geotubes and Aprons | 6. Mobilization/Demobilization |
| 3. Other Equipment/Supplies | 7. Measurement and Payment |
| 4. Laborers | |

1. WORK COVERED BY CONTRACT PRICE: The work described by this SECTION will include furnishing the described material and supplies, fabricating/furnishing the described equipment and operating personnel (operators and laborers) with any necessary operating supplies, all for constructing four geotube dike sections at a designated location on the Gaillard Island D/A.

2. GEOTUBES AND APRONS:

2.1. Geotube dimensions/construction: The Contractor shall fabricate and furnish four (4) geotubes, each geotube 500 foot in length (a total length of 2000 feet of geotube). Each geotube shall be fabricated from two twelve (12) foot wide pieces of fabric laid on top of each other and the longitudinal edges sown together. These sown seams must achieve a strength of 250 lbs/in. After construction the geotube will have a theoretical diameter of approximately 7.6 feet with its circumference approximately 24 feet. Inlet/outlet openings shall be sown into the geotube every 100 feet along one side of the geotube's length and midway between the sown joints. These inlet/outlet openings shall be capable of being securely fastened to the flexible pipe extension discussed below to form a leak proof connection.

2.2. Geotube fabric: One of each of the four geotubes shall be made from fabric with the following characteristics:

	#1	#2	#3	#4
W.W.T.S., #/in	400x400	400x400	250x400	250x400
A.O.S.. mm ≤ (w/liners)	0.210 (w/liners)	0.210	0.210	0.210
Initial Perm.: (gpm/sq ft)	40	10	20	10
Residual Perm.: (gpm/sq ft)	fill	fill	fill	fill
Type Fabric: NICOLON	570	570C	505	555
Nonwoven liner: N60	X	-	X	-

NOTE: W.W.T.S. is Wide Width Tensile Strength; A.O.S. is Apparent Opening Size; and Perm. is Permittivity.

2.3. Aprons: The Contractor shall furnish impermeable film (such as 4-mil polyethylene) in widths of at least 16 feet and in either continuous or overlapping lengths of 500 feet total (four sections, 16' X 500'). This material will be laid under the four geotube sections prior to pumping dredged material into the geotube. There will be a constructed water flow outlet off the apron at least every 100 feet along the apron edge.

3. OTHER EQUIPMENT/SUPPLIES:

3.1. Feeder pipeline material/construction: The Contractor shall furnish 3500 feet of 8-inch diameter light weight pipe (steel, aluminum, PVC, etc; irrigation pipe will meet this requirement) in no less than 25 foot long sections but no greater than 50 foot long sections. The pipe shall have quick connect-disconnect ends for ease of construction of the feeder pipeline. The Contractor shall furnish two slide valves (gate valves) which can be installed into the piping. The Contractor shall have the capability of installing (or fabricated into the pipe sections) a stub pipe or nipple at points along the feeder pipeline length at not greater than 100 foot intervals. The Contractor shall furnish a 25 foot long (minimum) flexible hose (8 inch dia.) that will be adaptable to be attached to the stub pipe or nipple on the feeder pipeline. The Contractor shall also furnish two 90 degree elbows that are adaptable to the feeder pipeline (adaptable to the required quick connect/disconnect pipe sections). The Contractor shall have several caps to fit the feeder pipe ends and stub or nipple ends if any of these need to be shut off during the operation.

3.2. Flexible extension pipe support: The Contractor shall fabricate and furnish at least two independent mobile support frames or structures that are capable of positioning and holding the flexible extension pipe suspended over the geotube and in the air as high as ten (10) feet above the surface on which the geotube sits (the support frame or structure must be capable of height adjustment reference the geotube and flexible extension pipe joint, all without physical reconfiguration of the structure itself). The mobile support frames or structures can either straddle the geotube (in which case the straddled space would be at least 12 feet) or reach to the center of the geotube from one side (in which case the cantilever would be at least 6 feet). The mobile support frames or structures will have to be stable under the loads presented by the geotube filling operations.

3.3. Tractor (Dozer): The Contractor shall furnish, equip and operate a wide track, low-ground pressure tractor (bull dozer) equivalent to a D-4 CAT. The tractor shall have an angle blade and winch.

3.4. Pressure gauges: The Contractor shall furnish and install two pressure gauges as directed by the Contracting Officer. One is anticipated to be installed into the feeder pipeline just down stream of the "Y" valve. The second gauge is anticipated to be installed into the feeder pipeline just prior to the flexible extension pipe section.

3.5. "Y" valve: The Contractor shall furnish and install a "Y" valve into the main dredge pipeline at a point at on very near the Gaillard Island dike crown where the main dredge pipeline enters the D/A. This installation may be done during only one, or both, of the work areas under SECTION 2B of the contract as instructed by the Contracting Officer. The "Y" valve will serve as a means to direct dredge slurry into the feeder pipeline described above therefore, that side of the "Y" valve must be adapted down to the 8-inch diameter pipeline size. The Contractor shall operate the "Y" valve as instructed by the Contracting Officer's Representative.

4. LABORERS:

4.1. The Contractor shall furnish laborer(s) as directed by the Contracting Officer's Representative. The number of laborers used will depend on what the operation of the demonstration calls for in the opinion of the Contracting Officer's Representative. The laborers will be used (or paid) for a full days activities when called out. The laborers will construct the feeder pipeline; place and handle the geotube and apron materials; position and operate the flexible extension pipe mobile frames or structures; and handle and connect the flexible extension pipe.

5. CONTRACTOR SUPERVISION:

5.1. The Contractor shall have on the site of the demonstration operations a representative capable of coordinating the materials supply and supervising the pipeline construction and equipment operation.

6. MOBILIZATION/DEMOBILIZATION:

6.1. All equipment, materials, supplies, etc, shall be mobilized to the designated work sites on Gaillard Island D/A within thirty (3) days after direction from the Contracting Officer.

6.2. All materials, supplies, and equipment except the filled geotube and apron materials shall be removed from the work site by the Contractor at the conclusion of the demonstration.

7. MEASUREMENT AND PAYMENT:

7.1. Bid Item No. 7.a.: The payment under this item shall include all costs for the Geotube and Apron material, fabrication and placement. Payment will be made as a lump sum when materials are satisfactorily in place.

7.2. Bid Item No. 7.b.: The payment under this item shall include all costs fabrication, furnishing, installing and operation of the Feeder Pipeline, the Flexible Extension Pipe, the Pressure gauges, and the "Y" valve. Payment will be made upon completion of the work.

7.3. Bid Item No. 7.c.: The payment under this item shall include all costs for fabrication, set-up, and operation of the Mobile Support Frames or Structures (2 each). Payment will be made upon completion of the work.

7.4. Bid Item No. 7.d.: The payment under this item shall include all costs for furnishing, equipping, operating supplies, operator, etc. of the Tractor. Payment will be made by the day where full credit for a day is given for working any part of the work day.

7.5. Bid Item No. 7.e. through 7.i.: The payment for any of these items will include all costs for equipping, transporting, and maintaining each Laborer. Payment will be made by the day where full credit for a day is given for working any part of the work day.

7.6. Bid Item No. 7.j.: The payment for this item includes all costs for mobilization and demobilization of all materials, supplies, equipment, personnel, etc. to and from the job site, as appropriate. Payment will be made upon completion of the work.

*

*

CASE HISTORY

NORRIEGO POINT GEOTUBE™ GROINS

Destin, Florida

June, 1991

OWNER: City of Destin
Contact: Philip Cook, City Manager
Phone: 904-837-4242

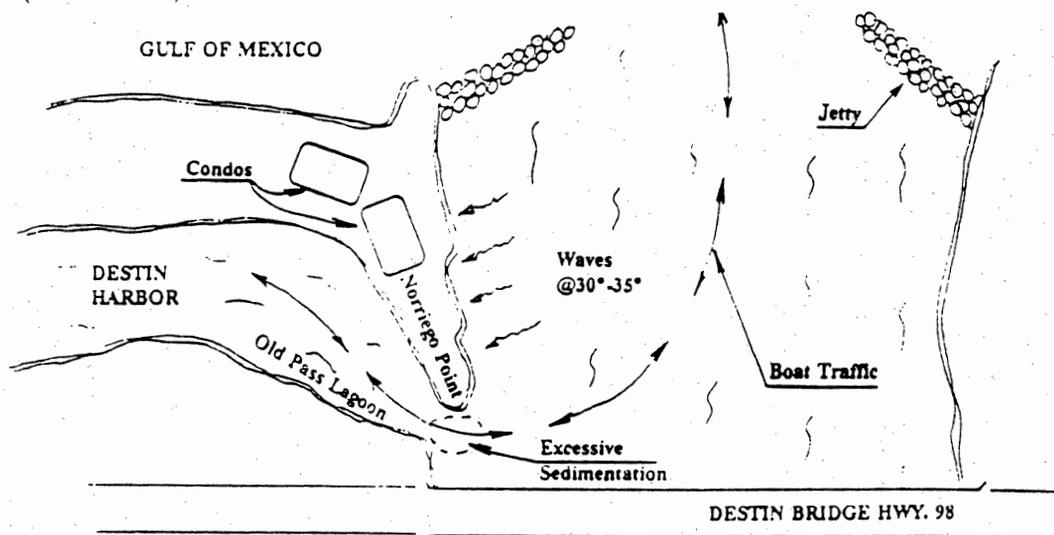
**ENGINEER/
DESIGNER:** US Corps of Engineers, Mobile District
Contact: Alton Colvin
Phone: 904-763-2881

CONTRACTOR: C.O.E. & Pekor Pumps & Nicolon Corp.
Contacts: Ed Griffin, Jr. (Pekor)
Joel Sprague (Nicolon)
Phone: 800-277-7867
Phone: 404-447-6272

PRODUCT: Geotubes™
Quantity: 3 ea. @ 100 LF x 225" circumference

PROJECT DETAILS:

Overview: Old Pass Lagoon leads into Destin Harbor and provides the only passage for boat traffic. Last dredged in 1988 and again in February of 1991, within 3 weeks further dredging was necessary. Clearly, accelerated erosion was taking place. Serious erosion of Norriego Point appeared to be the source of the sediments being deposited in Old Pass Lagoon. (See sketch).



Case History (Continued)

Design:

Realizing that constant dredging and replacing material on Norriego Point would be expensive, Alton Colvin from the COE Panama City Area Office developed a proposal to use a portable jet-pump dredge to "back-pass" sediment. A dredged-soil filled fabric groin would be used to stop sediments upstream of the lagoon channel. The specific equipment and fabric material required for the site depended primarily on the sand weight and gradation (See Fig. A) and the length of transport (See Fig. B). The following equipment and materials were chosen for the demonstration:

JETEL JET PUMP

Discharge:	2300 gal/min to 3500 max.
Discharge Head:	25 feet to 70 max.
Max. Particle Size:	5½ inches
Production Rate:	SG = 2.65, 159 CY/HR to 372 max. SG = 1.50, 172 CY/HR to 401 max.
Discharge Diameter:	8 inches

GEOTUBE™

Flat Bag Width:	112 inches	
Filled Width:	80 inches	} Projected
Filled Height:	60 inches	
Tube Length:	100 feet	
Fabrics:	Nicolon F570 (tube shell for strength) Geolon N60 (tube innerliner for soil retention)	

APRON

Dimensions:	50 ft. x 100 ft. with 24" hem sewn around edge. Hem either pumped with sand or slit and fitted with sandbags in place to reduce scour.
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Fabric:	Filterweave 70/20
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Case History (Continued)

Design (Continued):

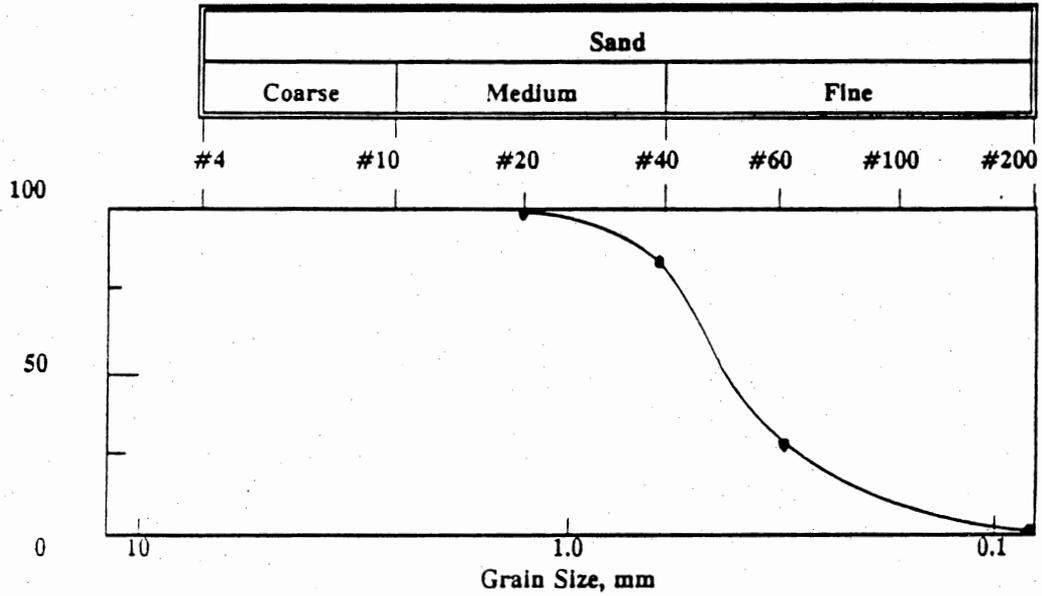


Figure A: Grain Size Curve

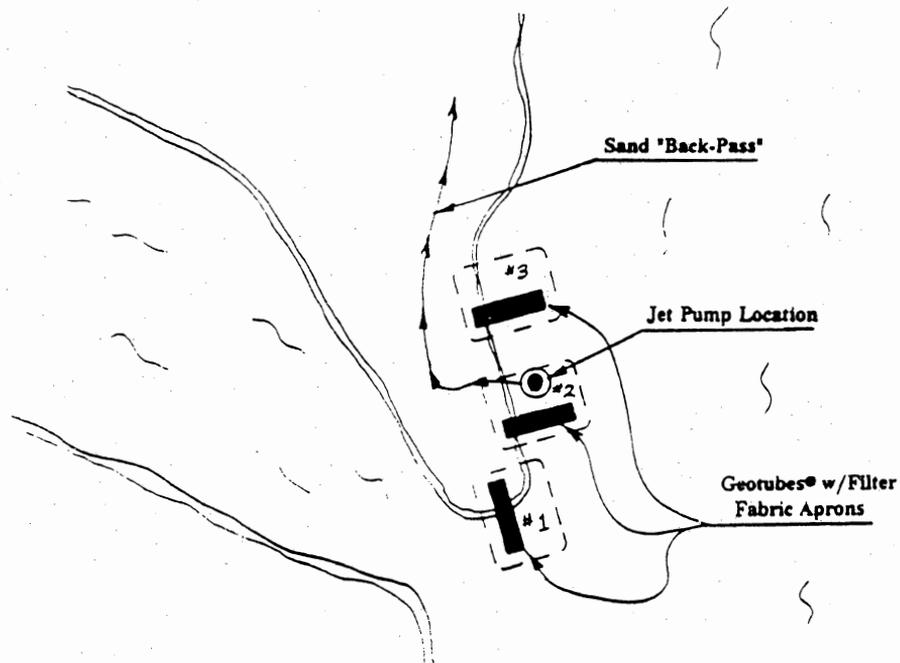


Figure B: Proposed Groin & Sand "Back-Pass" System

45X

Case History (Continued)

Construction:

Installation of the Geotubes™ and filter fabric aprons involved the following steps:

1. Construction of a sand platform out into the water and approximately to the dimensions of the filter fabric apron. Geotubes™ were all at or above water level.
2. Positioning of the filter fabric apron and ballasting of the edges of the apron using sandbags slid into slits in the hem (tubes #1 and #2) or by pumping sand into the continuous hem (tube #3).
3. Unrolling the Geotube™ into position and inserting the dredge discharge pipe into the selected tube inlet. Tube #1 had inlets at either end. Tubes #2 and #3 had an additional inlet in the middle.
4. Filling the Geotubes™ with dredged material under a pressure that is compatible with the tube shell strength. (The seam strength, especially at inlets, will likely control.)

Observations:

The following observations were made:

1. The Geotube™ design depends on the pump discharge pressure and capacity and the characteristics of the dredge material, including grain size distribution and specific weight.
2. The inlet design is critical to accommodating maximum pressure in the tubes.
3. Greater pressures within the tubes produces a higher profile.
4. Final moments of filling will require a gradual reduction in filling (perhaps using a valved configuration) to insure complete filling of tubes and a uniform cross-section throughout the entire tube length.
5. Enhancements in inlet design can improve aesthetic appearance and reduce the time and manpower required to connect/disconnect filling pipe.
6. Approximate material costs:
 - Geotube™ w/225" circumference @ \$15/LF
 - Filter fabric apron, 50' wide @ \$10/LF

Case History (Continued)

Observations (Continued)

7. Final height of tubes ranged between 4 and 5 feet. Less than originally expected as a result of lower pressures to accommodate weaknesses at inlet seams.
8. To-date the Geotube™ groins/sand "back-pass" system is adequately reducing sediment build-up in the lagoon channel and encouraging sand accretion on Norriego Point.

- - -

GEOTUBE™

Geotube is a geotextile tubular construction suitable for direct filling by a suction dredge delivery line. It was used for the first time in an industrial manner with great success in the project Leybucht on the North Sea in Germany in 1988. As shoreline protection, it provides a sure barrier to the fill placed to the inside, and a protection against currents and waves from the outside.

The Geotube is by choice of yarns and construction of the fabric made in such a way, that:

- sufficient permeability is achieved
- the dredge fill is secured
- a good resistance against all erosive factors is proven

The Geotube, as described above, ensures 100% filled tube coming up to 80%-90% of the theoretical circular diameter.

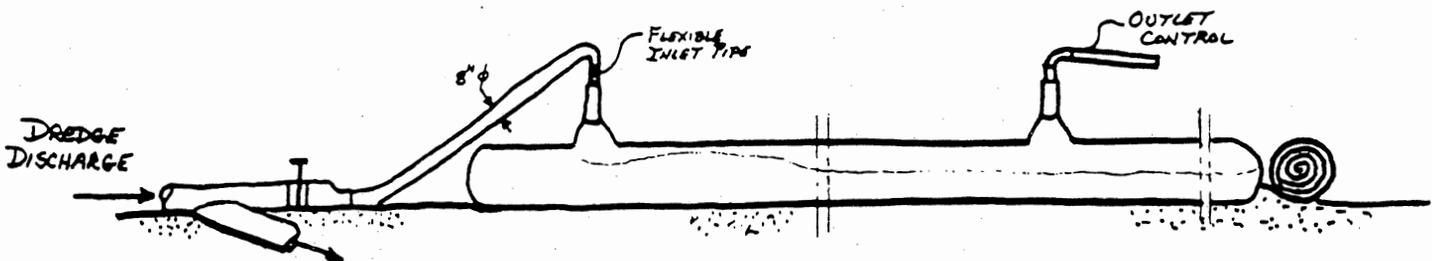
GEOTUBE™ DIMENSIONS

The fabric has a mill width of 3.81 meters (12.5 feet). A tube with the desired diameter is made out of this fabric, using a longitudinal seam(s). The length of the tube is only limited by practical weight limitations based on fabric weight of approximately 20 oz/yd.

Inlets/outlets are regularly spaced along the length of the tube at intervals appropriate to the settling characteristics of the dredge fill.

Inlet/outlet diameter is somewhat larger than the filling/inlet pipe.

The tube is delivered to the site rolled up on a steel rod.



GEOTUBE™ CONSTRUCTION

SITE PREPARATION

Before installation, a shallow ditch is made which is lined with a plastic film to keep water from washing soil away from under the tube while it is filled.



POSITIONING THE GEOTUBE™

The Geotube is rolled out along the intended alignment with inlets/outlets centered on top. Only the length intended to be filled at one time should be deployed. The Geotube should be "tied-off" at the end of each length to be filled slightly beyond on outlet.

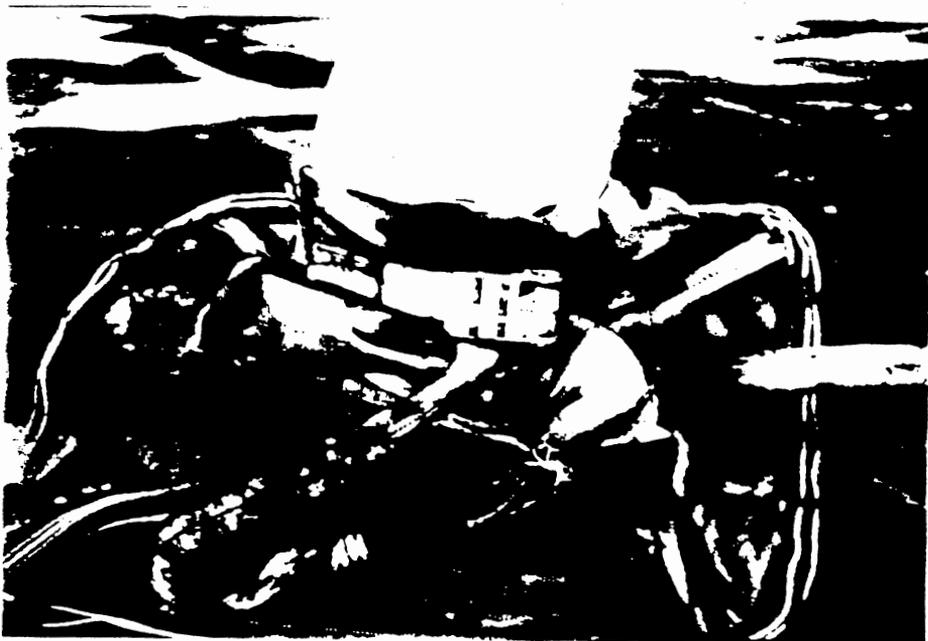
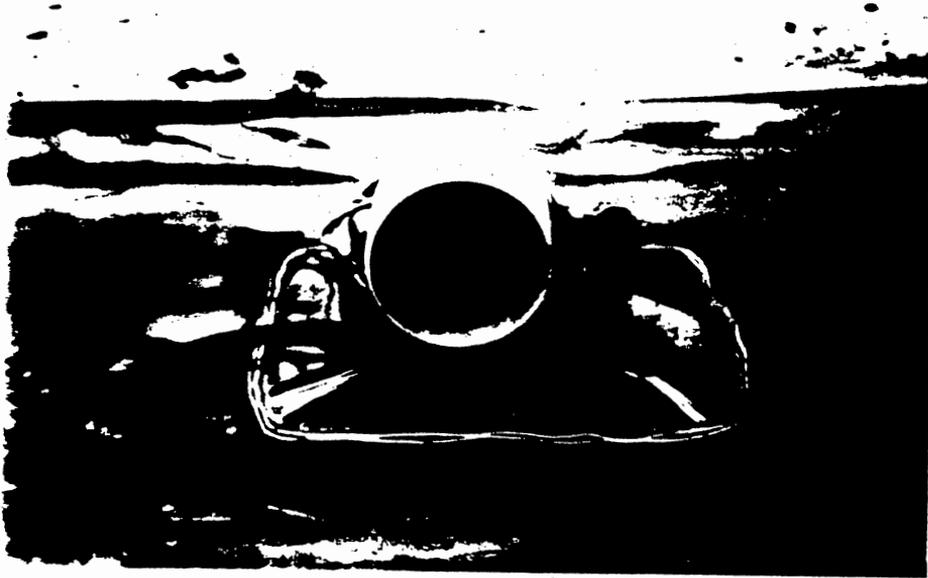


49X

DISCHARGE CONNECTION

Install an elbow and pipe extension in the fabric outlet to allow for controlled removal of water during the pumping process.

The fabric outlet is tightly secured to the discharge pipe to prevent leakage. The pipe extension is supported by an "A-frame" or comparable equipment capable of raising and lowering the discharge during filling.



INLET CONNECTION



The filling pipe is connected into the fill inlet. The pipe that leads into the tube must be flexible enough to avoid mechanical damage to the fabric during the pumping process, yet rigid enough to provide unrestricted flow. The fabric inlet is secured tightly around the filling pipe to prevent leakage. The inlet pipe must be supported by an "A-frame" or other comparable structure to prevent misalignment under pressure.

DREDGE LINE CONNECTION

For pumping purposes, a branch line - commonly 20 centimeters in diameter - with a slide valve is connected to the main line.

The main line runs to the dredge across a system of floats.



GEOTUBE™ FILLING



The pumping process will not be interrupted. By opening the slide valve, the tube will simultaneously be filled by the branch line. The actual rate of filling will depend on the granular size and weight of the dredge fill. A granular size of 0.10 mm is the most suitable as pumping sand. The dredge fill is commonly pumped in a slurry of 1:4. The water escapes through the fabric and through the outlet pipes, spaced at intervals along the tube. Based on experience, the filling of a 400 meter long tube with fine sand using outlets located every 75 meters (240 feet) takes about 5 hours.



ENHANCED FILLING

To expedite filling, the dredge-fill slurry can be pumped in from both ends, by two dredges.

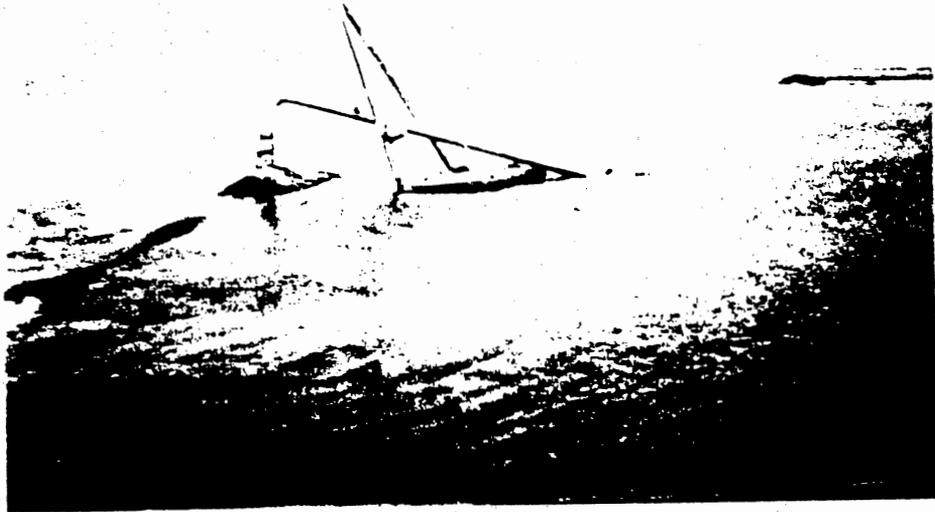


Consolidation of the dredge-fill within the tube occurs during and after filling. High slurry solids content and consistent, moderate in-flows optimize solids distribution and consolidation during filling. After several hours, the tube becomes completely filled, achieving a geometry approaching 80 percent of the theoretical circular diameter. Depending on the characteristics of the dredge-fill, final tube height may be effected by consolidation.

54X

CONTROLLING THE FILLING

Structural "A-frames" or other equipment capable of raising and lowering are used to properly position both the inlet and outlet pipes. The inlet pipe must be securely positioned to prevent misalignment while the outlet pipe must be raised or lowered to regulate internal tube pressure. The A-frames also assist in the connect/disconnect procedure which is cumbersome when pipes are filled with water and/or sediments.



SSX

EXTENDING TUBES

The tubes, which are commonly up to 400 meters long, are connected to each other, at the site, by sewing them with a hand sewing machine. There is about a 40 centimeter overlap between the tubes.



56X

GEOTUBE™ DURABILITY

A total of 3,000 meters (10,000 feet) of Geotube have been installed on the Leybucht building site. Twice a day at high tide, the water submerges up to 60 centimeters (2 feet) of the tubes. There has been no damage to the tubes during the initial one year period.



57X

Some severe weather has been encountered during the first year. At a water level of 1 meter (3.28 feet) above normal tide levels, waves broke over the tube. Even in winter, no damages or instabilities have occurred.



58X