



KATRINA

8



PROGRESS...RECOVERY, RESTORATION & REBUILDING

8 YEARS LATER



PRESENTED BY THE SEWERAGE & WATER BOARD OF NEW ORLEANS
August 29, 2013

KATRINA 8 YEARS LATER

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The stories in this booklet were prepared on behalf of The Sewerage & Water Board of New Orleans by its Community and Intergovernmental Relations Department.



“RE-BUILDING THE CITY’S WATER SYSTEMS FOR THE 21ST CENTURY”

Sewerage & Water Board of New Orleans

Mitchell J. Landrieu, President
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Notice To The News Media From The Sewerage & Water Board: An Introduction to “Katrina 8 Years Later...Progress...Recovery, Rebuilding & Restoration”

The Board of Directors and the men and women of The Sewerage and Water Board of New Orleans are proud to be a part of rebuilding the water, sewerage, drainage and power systems devastated by Katrina.

The Board is providing this packet of information about our many achievements in the 8 years since Katrina so that the citizens of New Orleans know of our accomplishments. Enclosed is a review of many projects completed, ongoing or planned.

Almost \$2 billion in funding has been dedicated to rebuilding the system. The total estimated project cost amount for all FEMA-related activity to date is approximately \$739 million. Of this amount approximately \$573 million is obligated by FEMA. Corps funding has included \$1.1 billion for SELA and \$145.8 million for storm proofing. About a million dollars of stimulus funds has also been received.

These articles include information on the ongoing rehabilitation of the sewage collection system, the major rebuilding of the massive drainage system and improvements to the water system and the Board’s own power plant. Stories about the heroics of the Board’s own “first responders” who stayed on duty in dangerous situations and those that risked their lives to report to their duty stations are included. Also, a glimpse at the S&WB response to Hurricane Isaac in 2012 is included.

Executive Director Marcia St. Martin said, “Our goal of full restoration remains, so that we can provide maximum service to those residents and business owners who stayed in the City and those who have returned, have opened new businesses or who are still planning to return. We are resolute in this challenge.”

S&WB GETS EARLY START ON HURRICANE PREPAREDNESS AGAIN THIS YEAR

Plans Are Reliable, Multi-Faceted

Last August, when Hurricane Isaac hit the area, the Sewerage & Water Board experienced no major problems with the drainage system or its field operations.

One main reason was that the Board was so well-prepared for the storm because its management and staff began its emergency planning and preparations early, well before the tropical season began. And that's the case again this year. The S&WB began its planning and training well before the tropical storm season began.

Under the direction of Executive Director Marcia St. Martin, the Board's team of emergency responders--managers, directors and crucial employees are prepared to go into action as soon as necessary.

Mrs. St. Martin said, "Another reason for getting the jump on our preparation is the fact that our city has experienced record-breaking rainfalls in the spring and early summer. Many of these rainstorms often create more runoff than our experience with hurricanes."

She added, "Many goals are built into the plan, including an immediate reaction to any problems which may develop that would interfere with the protection of our city's citizens and the safety of employees. The board's mobile command center has further enhanced communications and the coordination of efforts.

The S&WB leaders met with the U.S. Army Corps of Engineers and its partners in flood protection, to ensure that coordination of operations and communications between the two are in place and tested. Preparation meetings and tabletop exercises and contingencies that are triggered when a hurricane/tropical storm enters the Gulf were completed early.

This includes:

- * Emergency contracts for pre-staged generators at key facilities
- * Emergency response boats and communication equipment staged at various Drainage Pumping Stations
- * Arrangements for an Emergency Operation Center at the Main Water Plant to coordinate the S&WB's response to emergency events
- * Providing employees with placards for response and re-entry
- * Giving employees a 1-800 call-in number to report their location in the event they have evacuated.
- * Building emergency protective Tiger Dams to protect against flooding at the Main Water Plant Power House
- * Establishment of a Mobile Command Post to be staged in Baton Rouge as an alternate Emergency Operations Center

Mrs. St. Martin said " Management and staff are confident that our team of experts are well-prepared and able to work internally with our own team and externally with the City's overall Office of Emergency Preparedness Command Center, Corps of Engineers, levee districts and adjacent parishes. The input from those employees who experienced Katrina, Rita, Gustav, Ike and Isaac will be invaluable resources in the event a major storm approaches."

She concluded, "At all the many neighborhood, community, civic and business meetings we attend a prime concern of our citizens is our readiness for storms. I tell them that everyone on our team knows what to do and when to do it. I assure them that our plan is flexible enough to quickly adjust to unforeseen challenges. The citizens of New Orleans can be confident that we are ready to go into action when needed."

MARCIA ST. MARTIN RETIRING: LEAVES A LEGACY OF DEDICATION, ACHIEVEMENT AND POSITIVE RESULTS BEFORE, DURING AND AFTER KATRINA

Marcia St. Martin, who has served as Executive Director of the Sewerage & Water Board since August 2004, announced her retirement effective December 31, 2013, citing an upcoming double knee replacement surgery.

Ms. St. Martin, who was previously deputy director of S&WB for 12 years, has served the citizens of New Orleans in various capacities for 42 years.

“For the last several decades, I have focused on providing New Orleanians with quality water, sewer, and drainage services,” said Ms. St. Martin. “We have come a very long way from devastation to recovery, rebuilding and restoration despite the mighty forces of Hurricanes Katrina, Rita, Gustav, Ike and Isaac. I am proud of our many accomplishments. Our board and staff have made the tough decisions that make our agency viable today. It is never the right time to leave, but I will leave with the satisfaction of knowing that our most caring and dedicated board and employees will continue the rebuilding of this agency that is so critical to the lives and well-being of all of our citizens.”

During St. Martin’s twenty-two year tenure in S&WB leadership, the agency has experienced substantial innovative changes, development and growth despite significant challenges. As the S&WB’s Deputy Director and Executive Director, Ms. St. Martin is credited with bringing the agency directly to the citizens through improved and increased

public contact, hundreds of town meetings, and interaction with civic, business, and neighborhood organizations.

In one of her most important roles at the agency, Ms. St. Martin has administered the complex and comprehensive terms of the 1998 sewer system consent decree with the U.S. Department of Justice and Environmental Protection Agency.

Under that agreement, S&WB and the

City agreed to a \$600 million rehabilitation of the aging sewerage collection system throughout the city. Under St. Martin’s leadership, the consent decree has recently been renegotiated, and S&WB is in full compliance



with the decree, meeting all construction deadlines and avoiding the potential for millions of dollars in fines.

Of course, most importantly, Ms. St. Martin led S&WB through Hurricane Katrina and its aftermath, guiding the most extensive and massive reconstruction and restoration of a utility in U.S. history.

Though the U.S. Army Corps of Engineers predicted that it would take months to pump the water out of the city, S&WB made the tough decision to de-water the city using the S&WB pumping system, knowing that the brackish water could cause damage to the century-old system. Within a few days, S&WB had restarted most of its pumping stations and 11 days after the breaches were closed, the city

was pumped out and ready to enter the next phase of its recovery.

She is also responsible for developing a modern, customer-friendly website and televised board meetings, both designed to bring S&WB closer to its customers. She has overseen the development of the SELA drainage program in 1995 with the U.S. Army Corps of Engineers, established the “crescent meter logo” as the agency’s official and identifying symbol, and developed the extensive Bayou Bienvenue Wetlands Assimilation Project.

Under her leadership and command, all employees of S&WB remained at their posts during the hurricane.

Mayor Mitch Landrieu said, “Marcia guided the Sewerage and Water Board and its staff through its most trying times. Her bold leadership during the months following the storm and swift response in getting the agency back into operation was critical to our city’s recovery. Hurricane Katrina destroyed much of the agency’s water, sewerage, and drainage systems, as well as the power plant, but Marcia was committed to the rebuilding of New Orleans. I want to personally thank her for her decades of remarkable service to the people of New Orleans.”

Her stint as head of the S&WB highlights a career committed to public service in New Orleans. Ms. St. Martin began as an accountant at City Hall in 1972 and was promoted to

several positions there including directing the equipment maintenance division, parking division, and the Department of Safety & Permits.

Marcia St. Martin is a 1969 graduate of Xavier University of New Orleans, where she holds a bachelor’s degree in accounting and business administration. She served on the board and was Treasurer of Water for People USA, an international humanitarian organization that aims to improve access to drinking water, adequate sanitation, and hygiene education throughout the world. She also holds membership in the American Water Works Association, Water Research Foundation, Water Environment Federation, American Public Works Association, Association of Metropolitan Water Agencies, National Association of Clean Water Agencies, and Clean Water America Alliance. Ms. St. Martin is on the Board of Trustees of the Louisiana Asset Management Pool, Inc. (LAMP), a trustee on the Water Research Foundation, and is on the EPA National Drinking Water Advisory Council.

“Marcia’s leadership and vision will allow the board and staff to grow and thrive far beyond her tenure as Executive Director. It was great for her to share her plans for early retirement with us at this time. This announcement will give the Board an opportunity to begin the process of selecting the right successor during her transition,” said Sewerage and Water Board President Pro Tempore Wm. Ray Manning.

Mayor Landrieu and Mrs. St. Martin tour pumping station with Corps of Engineers, employees and board members



G. JOSEPH SULLIVAN A REMARKABLE 39 YEARS OF SERVICE TO THE SEWERAGE & WATER BOARD

G. Joseph “Joe” Sullivan, who served as General Superintendent of the Sewerage & Water Board of New Orleans for 36 years, passed away in December of 2011 at the age of 85. For three years he served as General Superintendent Emeritus, working with new Superintendent Joseph R. Becker.

In 1972 Sullivan was appointed general superintendent by then Mayor Moon Landrieu. He was only the 5th person to occupy this position since 1899.

As general superintendent, he oversaw the expansion of every system at the Board-water, sewerage, drainage and power generation.

Mayor Mitchell J. Landrieu, president of the Sewerage & Water Board, said, “The City of New Orleans has lost a great man and a creative engineer who knew the challenges and solutions to the problems of our below-sea-level City better than anyone.”

“His peers throughout the nation respected him and recognized him with numerous awards for the many innovations which helped make our one-of-a-kind water systems continue to serve us so well for so long.”

Sullivan led much of the post-Katrina recovery of the Board. This was no easy task. In his late 70s, he was involved with the Corps of Engineers construction of flood gates at the 17th Street Canal and other outfall canals, the restoration of drainage and sewer pumping stations and treatment plants, power plant recovery, water distribution and a myriad of other on-going projects.

Upon his retirement in 2008, the Board honored him with an event at the World War II Museum which was attended by Board members, present and former employees, elected officials and other dignitaries he worked with

over the years.

During Katrina, Mr. Sullivan stayed at the Board's Power Plant in Carrollton. After the storm, he led restoration of the Board pumping stations, treatment plants and the water treatment plant.

In January of 2009, Drainage Pumping Station No. 6 on the 17 St. Canal, the world's largest pumping station, was named in his honor. Under Mr. Sullivan's watch, much of the modern and efficient water, sewer and drainage systems were constructed.

In 2003, he was honored By ASCE (American Society of Civil Engineers) with the ASCE Louisiana Section Outstanding Government Civil Engineer Award

Sullivan has received many awards for his technical expertise, lifetime accomplishments and contributions to his profession.

His retirement in 2008 brought to an end more than 36 years of hands-on service, leadership and direction to the Sewerage and Water Board and over 50 years of service within the construction industry.

Mr. & Mrs. G. Joseph Sullivan in front of Drainage Pumping Station No. 6



Improved Systems & Services Part of Plan

RATE INCREASE WILL HELP THE SEWERAGE & WATER BOARD RE-BUILD AGING WATER AND SEWER SYSTEMS

It is well documented that even before Katrina, the Sewerage & Water Board was in dire need of funds to repair and re-build its aging sewer and water systems.

Rates had not been increased in more than 20 years, while the cost of construction, materials and labor had increased in double figures.

Katrina only made matters worse, despite the Board's expertise and ability to obtain FEMA funds and other Federal assistance. The Board's costs grew with every new project brought on by the storm's damages.

But much help came when The City Council passed a rate increase that the Sewerage and Water Board had already approved at its monthly November 2012 meeting. The rate increase is 10% annually over 8 years.

Mayor Mitchell J. Landrieu said, "This council and the board of directors should be congratulated for the vision, insight and understanding of the importance of the board's mission and commitment to this city with a call to action for a rate increase that was so critically needed.

"They understood that there was a need for significant funding to revitalize, stabilize and continue to maintain the board's ability to provide services that will protect the health and safety of our community, he said.

The process for getting to this conclusion started over two years ago with a comprehensive study of financial requirements in 2010. The purpose of the analysis was to identify financial requirements for the water, sewer and drainage

The Sewerage & Water Board's staff is constantly developing and exploring new processes to improve its operations. One such project at the Carrollton Water Purification Plant is the Sodium Hypochlorite Bulk Storage/Feed Facility. It eliminates the need for transporting chlorine by rail and storing it on the plant grounds. Instead, the Board will use the safer sodium hypochlorite for disinfectant in the purification process and easily store it in a nearby facility. This chemical increases safety for surrounding neighborhoods and Board employees.





Drainage Pumping Station No. 7, on Marconi Drive near City Park, now has a new 4,023 horsepower, 3 mega watt generator to run one of its pump should commercial power be interrupted. The station pumps storm water through the Orleans Outfall Canal to Lake Pontchartrain. The cost of this important generator, its two-story housing building and fuel supply tank was \$16 million, fully paid for by Federal funds through the U.S. Army Corps of Engineers. The housing building was designed to blend into the landscape of nearby neighborhoods.

systems and develop recommended approaches for funding.

The funding included constructing, operating and maintaining the systems. The board's broad based plan included a comprehensive approach to fund the overwhelming capital and operational needs to provide quality of life services to our residents.

Post Katrina conditions which included financial issues for survival, plagued both the customer base and the agency. All of this and more were taken into consideration as the board reviewed and re-evaluated every way possible financially to meet its Federal mandates and system rebuilding dictates while keeping the rate increase at an acceptable level.

Mayor Landrieu gave his full support and led the measure after the Board agreed to lower the amount of the increase and to install certain procedures and policies of the Board.

Staff and consultants reduced the rate to 10% annually for both water and sewer. It was out of an abundance of concern for educating the public that citywide and area community meetings were held.

The Mayor said, "Since taking office, my administration worked to secure federal resources

to keep rates as low as possible. We secured over \$200 million in new funding from FEMA for repairs to thousands of water and sewer lines, power plant equipment, pumps and pump stations. We have secured nearly \$150 million in FEMA Hazard Mitigation funds to help repair the aging power plant. We are presently working with our Congressional delegation and the EPA to continue to reduce our burden of necessary costs related to the consent decree. Consideration for low income and the elderly has always been foremost in our minds. Thus, a part of the plan includes improved funding and functioning of the board's "Water Help" program administered by Total Community Action.

In July, 2013 the board was pleased to announce the upgrading of the Sewer and Water Revenue Bonds. The Rating Services increases were based on the systems' financial position with the securing of the pre-approval of the rate increases.

Overall, this rate increase was critical to provide the quality of life services of water, sewer and drainage that ensures the vitality and sustainability of New Orleans. The longer it would have been delayed the more expensive it would have been and the greater the risk to the city.



The Facility Maintenance Department fabricates, in-house, gears of various dimensions and specifications to accommodate the many different size valves that are used throughout the water and sewer systems.

BEING FIRST IN ALL ASPECTS OF DUTIES IS THE GOAL OF S&WB EMPLOYEES

Many citizens don't realize it, but a cadre of managers and employees of the Sewerage & Water Board are considered "first responders" in emergency situations, much like fire fighters, police and gas and electric utility workers.

The Board reacts quickly when a fire breaks out, sending personnel to the scene to make sure firefighters can locate and activate the nearest and most powerful hydrants in the area.

In other situations, such as chemical or fuel spills in the river, water intake and water plant operators join with managers and chemists quickly to react with proper procedures, equipment and chemicals to offset the danger

of the material in the river from entering the treatment plant. Quick action is also required when a problem develops at the Board's electrical generation plant, which provides power to pump water at high pressure to all homes, businesses, commercial operations and more than 18,000 fire hydrants.

Many times parts must be manufactured on the plant site at the Facility Maintenance Department because of the age and design of some parts. These parts no longer can be found "off the shelf" and are manufactured as sole source parts by the board.

The staff also refurbishes various pumps, motors, generators and other parts at Board facilities.

In the field, the Board's "First Responders" are often called to repair a locked valve, large water main or a problem at one of the underground power cables serving the water distribution system.

The Board's staff is constantly finding new ways to improve operations and save funds, especially post-hurricane events since 2005 that caused a great deal of impact to the system.

One such project is a specially-designed turbine which will power a 15-megawatt generator constructed by the U. S. Army Corps of Engineers. The generator will give the S&WB's Division of Pumping and Power the capability to improve the operation of its drainage, sewerage and water pumping systems in emergencies. The generator, funded 100% by the Corps, is part of a storm-proofing project for Orleans

Parish. The project, located on the grounds of the Carrollton Water Purification Plant, will cost in excess of \$32 million.

Another such project is in operation at the Carrollton Water Purification Plant. The Sodium Hypochlorite Bulk Storage/Feed Facility eliminates the need for transporting chlorine by rail and storing it on the plant grounds. Instead, the Board is using the safer sodium hypochlorite for disinfectant in the purification process and easily stores it in a nearby facility. This chemical increases safety for surrounding neighborhoods and Board employees.

Underway is the FEMA water line replacement program with the goal of reducing the volume of unaccounted for water in the distribution system. Staff worked diligently with FEMA and the award of funds continues to be

granted.

New Orleans continues to be the festival, special and sports events Capital in the World and one of America's Most Interesting Cities. During events, the City's population increases often with an additional surge of as many as 250,000 visitors in a very compressed time frame.

City officials have often recognized the Sewerage & Water Board's role in the successful staging of the events as crucial. In fact, providing the essential quality of life services of water, sewer and drainage is always extremely important. It is a priority of the men and women of the S&WB

to make sure that the Sewerage and Water Board can continue to fulfill its mission as that constant provider for the city.

The services that the Board provides are an integral part of allowing the City to put on the biggest and best extravaganzas in the world. The Board's staff is working hand

and hand with the City as we go about the process of improving streets, the streetcar line and the spruce up of the City for all of our citizens and the hundreds of thousands of guests who make our city home during their visit.

Since 1998, the U.S. Environmental Protection Agency (EPA) requires all water utilities to produce and distribute annual water quality reports. The fifteenth report included testing results for the year 2012. We hope that you found this Consumer Confidence Report both interesting and informative.

We want all of our valued customers to be well informed about all aspects of the water system. For more information go to the Board's website: www.swbno.org

THE MISSISSIPPI RIVER WATER IS TREATED AT THE CARROLLTON WATER PURIFICATION PLANT FOR EAST BANK CUSTOMERS IN ORLEANS PARISH AND AT THE ALGIERS WATER PURIFICATION PLANT FOR WEST BANK CUSTOMERS IN ORLEANS PARISH. IN 2012 THE CARROLLTON WATER PURIFICATION PLANT PROVIDED AN AVERAGE OF 138 MILLION GALLONS OF DRINKING WATER PER DAY TO A POPULATION OF 319,275. THE ALGIERS WATER PLANT PROVIDED AN AVERAGE OF 11 MILLION GALLONS OF DRINKING WATER PER DAY TO A POPULATION OF 53,082.

Progress Continues

IMPORTANT RECOVERY PROJECTS CONTINUE TO GROW IN NUMBER AND COMPLEXITY

The Board of Directors of the Sewerage and Water Board of New Orleans, its management and employees knew they had an incredible restoration and re-building challenge after Katrina, once all the damages and devastation to facilities and equipment were assessed.

So immediately after Katrina hit eight years ago, the staff achieved more than most thought they could. But, with an organized plan and the knowledge and skill of many on-staff experts, an incredible number of construction and repair projects were begun to once again provide quality and reliable water, sewer and drainage services for the citizens of the City. Many have been completed and numerous others are in progress, in the bid cycle or ready for bid. Funding of these projects have been a cooperative effort with the Federal Emergency Management Agency (FEMA) and the Army Corps of Engineers.

To assure a rapid response and realizing the magnitude of the repair and re-building work, the Board contracted with three program managers, one each for water, sewerage and drainage recovery projects. The Board also contracted with design firms to help speed the construction process.

The total estimated project cost amount for all FEMA-related activity to date is approximately \$739 million. Of this amount approximately \$573 million is obligated by FEMA. Additionally, major projects scheduled before the storm have now begun, been completed or are underway.

The Sewerage & Water Board's recovery efforts began the day after Katrina hit and have continued constantly thanks to the dedication of the Board members, management and

employees. These individuals stayed during Katrina or returned quickly to plan and restart operations immediately.

Executive Director Marcia St. Martin said, "Our goal of full restoration remains, so that we can provide maximum service to those residents and business owners who stayed in the City and those who have returned, have opened new businesses or who are still planning to return. We are resolute in this challenge."

"While we did get a fast start on repairs, we will not rest on our laurels. Instead, we are using our minds, expertise and knowledge



of our systems to restore many of our pumps, machinery, equipment, computers, facilities and vehicles and put them back into service more quickly than expected."

She added, "And, while we still have a lot of critical work

to do, I think it's important for our citizens to know we've already had many successes in all departments and there are many more to come."

These are just *some of the major undertakings* the Board staff and program managers have accomplished in the last eight years:

FEMA has obligated (to date) \$243 million to the water system. Some of the projects in this area include:

- Repair of Old Carrollton Pumping Station and Central Yard Annex Building overall complete restoration repairs
- Modifications to Algiers Water plant disinfection system
- Removal of residential meters from abandoned accounts
- Since Katrina and through July 31, 2013,

125,796 water main leaks, and house service leaks, hydrant leaks, valve jobs and meter related repairs were made.

- Also, 18,804 fire hydrants were inspected for pressure, lubricated and painted. 5,763 valves related to hydrants were inspected. Corroded anti-theft devices, which prevent water from being stolen, were replaced on the hydrants

- Some 15,781 paving jobs related to the repair of leaks were completed.

In the area of sewer projects FEMA has obligated (to date) \$238 million. Projects included are:

- Fluidized Bed Incinerator at the East Bank Sewage Treatment Plant

- Michoud and Lamb Sewage Pumping Stations

- Mechanical repairs to various citywide sewage pumping stations

- Continued rehabilitation of the East Bank Sewage Treatment Plant destroyed by Katrina

- Emergency installation of bypass pumps around damaged sewage pumping stations

- Sewer line leaks and breaks repairs

- Electrical repairs to sewage pumping stations

- Completed the rehabilitation of over 60 sewer pumping stations

- Completed sewer repairs related to the Emergency Sanitary Sewer Assessment project.

- Hurricane Katrina nearly destroyed the East Bank treatment plant and flooded almost every lift station on the East Bank.

- Following Katrina, the Sewerage and Water Board of New Orleans, Environmental Affairs Division was successful in obtaining a \$400,000 grant from the Delta Regional Authority to develop feasibility and pre-design for the Wetlands Assimilation Project. The Environmental Affairs Division was also able to obtain a \$10 million grant from the state's Coastal Impact Assistance Program (CIAP) to construct the first phase of the estimated \$65 million project. Construction of the project has commenced with a 20-acre demonstration project adjacent to the East Bank Sewage Treatment Plant.

A history making completion of a Memo of Understanding with the Corps of Engineers and the State for \$1 billion in SELA urban drainage projects throughout the city was executed. An additional \$48 million was obligated by FEMA for other drainage projects. SELA drainage projects included:

- A Corps of Engineers contract to build a concrete box culvert canal along Dwyer Road to improve drainage in eastern New Orleans.

- Construction of the new canal in Dwyer Road from Jourdan Road to the St Charles Canal is ongoing.

- Construction of the Florida Ave Canal from Mazant St to DPS No. 19 is ongoing.

- Contract to construct a new canal in Claiborne Ave from the Monticello Canal to Leonidas is under construction.

- Contract to construct a new canal in Napoleon Ave from Claiborne Ave to Carondelet Street is under construction.

Harrell Park was returned to the New Orleans Recreation Department after construction of a new football field and track. This NORD park was used to house SWB employees whose homes were destroyed so they could return to work. The park was a priority of the Board to restore as a New Orleans Recreation Department NORD facility.

The Sewerage and Water Board continues to work very closely with the city's Department of Public Works, in the coordination of street projects. The board's staff evaluates, plans and ensures that any water lines or sewer lines that need to be repaired are done. The closely coordinated work schedules on the Recovery Roads Program makes the street construction activity less inconvenient on the residents of the affected areas. The board staff also collaborates to co-ordinate infrastructure work with the state's Department of Transportation and Development, along with the city, on the Paths To Progress Program. Both of these programs include the paving of selected streets on the eastbank of the city.

Overall, this work marks the most aggressive and important rebuilding of the water, sewerage and drainage systems in the 110-year history of the Sewerage & Water Board.



Generator building at DPS # 7 is now complete.

NATURE, TOPOGRAPHY AND AGE CHALLENGE POWERFUL DRAINAGE SYSTEM EACH DAY

When it comes to topography, New Orleans is like a saucer. Levees that have been built to keep out the Mississippi River and Lake Pontchartrain serve to keep in all the rainwater that falls. Many parts of the city are as much as 6 feet below sea level, requiring rainwater (an average of 58.12 inches a year) to be pumped out.

Six inches of rain across the city produces about 69.8 billion pounds of water. That's about 8.2 billion gallons, enough to fill a lake ten feet deep and two miles square. Because the river levees are higher than the lake levees, most storm runoff is pumped into Lake Pontchartrain.

Exceptions are the two West Bank pumping stations and two stations in Eastern New Orleans that pump into the Intracoastal Waterway or the Industrial Canal, respectively.

Our drainage system of today dates back to the turn of the century. The New Orleans Drainage Commission was established in 1896 and merged in 1903 with the Sewerage and Water Board.

There are 24 Drainage Pumping Stations (DPS) in New Orleans. Station personnel are on duty 24-hours a day, seven days a week.

There are 7 unmanned pumping stations. Though fully automatic, S&WB personnel are sent to these unmanned stations during rainfall events.

There are also 13 underpass stations, each with two or three pumps that are automatically turned on by rising water. These pumps are checked every week and are monitored by field personnel during rain events.

The system's pumping capacity is over 50,000 cfs. (cubic feet per second) enough to empty a lake 10 square miles by 10.5 feet

deep every 24 hours. That flow rate is more than the flow rate of the Ohio River, the nation's fifth largest.

The S&WB's drainage network includes approximately 90 miles of open canals and 99 miles of newer subsurface canals. Many of the subsurface canals are large enough to drive a bus through.

Millions of dollars were invested to upgrade the system after the flooding rains of the 60s, 70s, 80s and 90s, which ruined homes and businesses.

Then came Katrina, destroying the newer parts of the system as well as the older parts which served us so well for so long.

Fortunately, through the Board's long-standing relationship with the Corps of Engineers, millions of dollars in projects were carried out when Board funding was not available.

Immediately following the storm, after the breaches were closed, it took the SWB employees 11 days to de-water the city. Then, the Corps worked with Board employees to repair the salt-water damaged motors by rewiring and baking them so that the pumps could continue to do the work of the drainage

system

The Corps also spent \$39.6 million to repair and restore 23 of the hardest hit stations and the Carrollton Frequency Changer Building to their Pre-Katrina levels of operation. The final station to be repaired in Orleans Parish was the Elaine Street Pump Station, which was completed in October 2010.

Additionally, the Corps storm-proofed stations throughout the City so that they can remain operable during and immediately following tropical storm events. This work strengthened the existing buildings, making it safer for S&WB employees that stay on site, as they work throughout all significant weather events. The storm-proofing cost is over \$145 million.

Also, in many cases the pumping stations have back up power making them more dependable. Commercial power losses can occur during a storm and adverse weather events.

The Board of Directors, the engineering staff and the Corps work together in the best interest of the citizens to continue to improve a most crucial asset—the Board's massive drainage system.

New power house # 3 at the main water plant is nearing completion.



\$145.8 Million Program:

U.S. ARMY CORPS OF ENGINEERS HURRICANE PROTECTION OFFICE & SEWERAGE & WATER BOARD OF NEW ORLEANS ARE WORKING TOGETHER ON STORM-PROOFING OF INTERIOR PUMP STATIONS



DPS 6 Generator

These completed projects provide for two (2) 60 Hz, 3 mega watt emergency back-up generators for the 60 cycle equipment at DPS 6. Program cost \$1.7 Million *.

15 MW New Generator & Storm-Proofing of The Power Plant

This 75% completed project provides S&WB with a 15 MW, 60 Hz generator at the Carrollton Power Plant Complex. This new Facility is called Power House No. 3. Also this project will apply storm-proofing measures at the Carrollton Power Plant complex (High Lift, Low Lift, Boiler Room, Power House No. 2, Central Control, etc.). These storm-proofing measures include, but are not limited to water intrusion protection, roof and wall reinforcement, strengthening of louvers, doors, shutters and ventilation systems and miscellaneous electrical and mechanical equipment storm proofing



measures. Program cost \$51.0 Million.



** All costs are based on the 4/29/2013 Information provided by USACE*



Storm-Proofing of Old & New River Intake Stations

This completed project provides storm-proofing measures at the Old and New River Intake structures. These storm-proofing measures include water intrusion protection, roof and wall reinforcement, strengthening of louvers, doors, shutters and ventilation systems and miscellaneous electrical and mechanical equipment storm-proofing measures. Program cost \$4.1 Million.



Two 300 CFS Pumping Station and Generator

To help ensure the operability of DPS No. 5 during hurricanes, storms and high water events, two new-elevated vertical pumps, at 300 cubic feet per second (cfs) each will be installed. These pumps will be housed in a new elevated hurricane-proof structure. A 60 Hz, 3-megawatt generator will be installed to provide back up power. Project is about 50% complete. Program cost \$26.0 Million.



DPS 20 Generator Bldg. and Storm-Proofing of DPS 3, 6, & 20

This 90% completed project will apply many of the previously described storm-proofing measures at DPS 3, 6, & 20 along with storm-proofing the existing generator at DPS 20. These storm-proofing measures include water intrusion protection, roof and wall reinforcement, strengthening of louvers, doors, shutters and ventilation systems, providing fuel tanks and miscellaneous electrical and mechanical equipment storm-proofing measures. At DPS 20 the existing generator is relocated in a new flood-proof building that is above the Design Flood Level. The new generator building is now connected to the existing DPS 20 building with a secure covered walkway. This walkway will be used by the pump station operators to move between the existing DPS 20 control room and the new generator building. Program cost \$12.7 Million.



DPS 7 Generator and Storm-Proofing

This completed project provides many of the previously described storm-proofing measures at existing DPS 7 along with a new 60 Hz, 3-megawatt generator and accessories. This generator is installed in a new generator building. These storm-proofing measures include water intrusion protection, roof and wall reinforcement, strengthening of louvers, doors, shutters and ventilation systems, providing a fuel tank and miscellaneous electrical and mechanical equipment storm-proofing measures. Program cost \$16.5 Million.



Storm-Proofing DPS 1, 2, 4, 19 & I-10

This 70% completed project will apply many of the previously described storm-proofing measures at DPS 1, 2, 4, 19 and I-10. These storm-proofing measures include water intrusion protection, roof and wall reinforcement, strengthening of louvers, doors, shutters and ventilation systems, providing house generators and fuel tanks and miscellaneous electrical and mechanical equipment storm-proofing measures. Program cost \$16.4 Million.



DPS 13 Generator Building and Storm-Proofing

This completed project utilized many of the previously described storm-proofing measures at DPS 13. These storm-proofing measures include water intrusion protection, roof and wall reinforcement, strengthening of louvers, doors, shutters and ventilation systems, providing a house generator and fuel tank, and miscellaneous electrical and mechanical equipment storm-proofing measures. Also as part of this project a new 60 Hz generator building facility is built with two 3-megawatt back-up emergency generators to enable pumping capacity. Program cost \$17.4 Million.



Drainage construction work on Napoleon Avenue

SELA PROJECTS CONTINUE THE FIGHT FOR IMPROVED DRAINAGE

\$1 Billion Investment

Heavy rainfalls in the late 70s, 80s and 90s brought severe and frequent flooding of thousands of homes, businesses, streets and cars in the City, with damages in the millions.

Citizens hurt most by the flooding formed drainage committees and called on the Sewerage and Water Board to upgrade its aging and inefficient network of canals and pumping stations.

A plan to greatly increase the capacity of the drainage system was prepared by the Board, but it did not have the massive funding to do all of the construction projects needed throughout the City.

But the rain event of May of 1995 showed the drainage needs when as much as 18.75 inches of rain fell on the City, causing massive flooding and, again, millions in damages.

This rain event caused serious damages to homes, business losses and major inconveniences associated with rainfall flooding in Southeast Louisiana. Citizens, and local officials in the tri-parish area of Orleans, Jefferson and St. Tammany requested Federal assistance in developing and implementing solutions to the flooding problem.

In 1996, Congress quickly authorized the design and construction of the Southeast Louisiana Urban Flood Control Project (SELA), in a partnership with the U.S Army Corps of Engineers.

Most of the SELA projects were large and expensive construction projects or improvements to canals, pumping stations and power facilities.

The Project Cooperation Agreement executed by the Sewerage and Water Board

of New Orleans (S&WB) in January 1997 required that the Federal government provide 75% of the total cost of the SELA projects in Orleans Parish, and that the S&WB provide 25%.

The S&WB files applications on a project-by-project basis, with the Statewide Flood Control (SWFC) program, administered by the Louisiana Department of Transportation (LaDOTD). The SWFC program provides 70% of the 30% S&WB cost share for projects approved by the SWFC program.

The Phase One SELA projects, completed before Katrina through August of 2005 at a cost of \$238 million were:

Expansion of Drainage Pumping Station No. 1 at S. Broad and Martin Luther King Jr. Blvd. by 2,400 cubic feet per second (cfs).

New concrete box canals beneath Napoleon Ave. from S. Broad to S. Claiborne; on Claiborne from Nashville Ave. to Jena St. and on Claiborne from Jena to Louisiana Ave.

New canals in Hollygrove beneath the railroad right of way and Eagle, Forshsey and Dublin streets, and the Dwyer Road Pumping Station Outfall Canal in eastern New Orleans.

In the years immediately preceding hurricane Katrina, the Federal funding level did not support the start of many projects that had been approved as SELA projects in Orleans Parish. But, in the aftermath of hurricane Katrina, this appropriation was 100% federally funded, which was \$107 million.

Because of the increased construction costs in southeast Louisiana, as the region rebuilds from hurricane Katrina, in 2008 Congress appropriated an additional \$1.3 billion for SELA. These funds are to be cost shared at 65% Federal and 35% local with payback via a 30-year plan granted by the Administration.

A new Project Partnership Agreement was executed in January 2009 which provides that 65% of the total project cost will be Federal, and

35% will be S&WB. Also, the agreement allows for the S&WB to pay its share over a 30-year period. It is anticipated that over \$800 million of this money will be utilized to complete SELA Orleans projects.

Among them are:

Federal SELA Projects – Phase 2 – Construction started in 2010 and beyond:

The next Federal SELA projects to be constructed in Orleans Parish with post-Katrina 6th and 7th Emergency Supplemental Funds of \$838M with a 65/35 cost share (\$545M Federal/\$293M S&WB):

- Florida Ave. Canal Phase 2 (Mazant to Piety) *Under Design*
- Florida Ave. Canal Phase 3 (Piety to St. Ferdinand) *Under Design*
- Florida Ave. Canal Phase 4 (St. Ferdinand to Deers & Peoples) *Under Design*
- Louisiana Ave. Canal (Claiborne to Constance) *Under Design*
- Napoleon Ave. Canal Phase 2 (Claiborne to Carondelet) *Under Construction*
- Napoleon Ave. Canal Phase 3 (Carondelet to Constance) *Advertised*
- Jefferson Ave. Canal Phase 1 (Claiborne to Dryades) *Awarded*
- Jefferson Ave. Canal Phase 2 (Dryades to Constance) *Under Construction*
- S. Claiborne Canal Phase 1 (Monticello to Leonidas) *Under Construction*
- S. Claiborne Canal Phase 2 (Leonidas to Lowerline) *Under Construction*

Through the combined forces of the Board and the Corps, drainage is being improved throughout the entire City through the many projects underway, nearing completion and under design—all to add protection against flooding.

For more info on SELA and projects, see the S&WB website: swbno.org. On the home page click Current Projects and then select Drainage



East Bank Waste Water Treatment Plant New Administration Building at 6501 Florida Ave.

WORK ON SEWAGE COLLECTION SYSTEM REMAINS A TOP PRIORITY

The sewage collection system operated by the Sewerage & Water Board of New Orleans serves an area of approximately 86 square miles and a population of approximately 350,000. Work on the system continues as the Sewerage and Water Board rebuilds and upgrades the infrastructure.

It consists of over 1,300 miles of gravity collection and trunk sewers ranging in size from 8-inches to 84-inches in diameter and over 120 miles of force mains ranging in size from 6-inches to 72-inches in diameter.

There are 86 sewer lift pump stations which help convey wastewater to the City's two wastewater treatment plants, one on the East Bank and one on the West Bank (Algiers) of the Mississippi River with a combined capacity of 132 million gallons per day (mgd).

Hurricane Katrina destroyed the East Bank treatment plant and flooded almost every lift station on the East Bank. The FEMA funds obligated to repair the sewer system to date is \$238 million. In addition, we also received \$141 million in Hazard Mitigation Grant funds from FEMA for the Power house.

Following Katrina, the Sewerage and Water Board of New Orleans' Environmental Affairs Division was successful in obtaining a \$400,000 grant from the Delta Regional Authority to

develop feasibility and pre-design for the Wetlands Assimilation Project.

The Environmental Affairs Division was also able to obtain a \$10 million grant from the state's Coastal Impact Assistance Program (CIAP) to construct the first phase of the estimated \$65 million wetland assimilation project. Construction of the project has commenced with a 20-acre demonstration project adjacent to the East Bank Sewage Treatment Plant.

S&WB Receives Awards for Wastewater Treatment Operations

Nationally, the Sewerage and Water Board has received many high level awards for its work in wastewater. Recently for 2011 and 2012 the Sewerage and Water Board earned 2 Gold awards for operations at the West Bank and East Bank wastewater treatment facilities respectively.

In 2012, the West Bank Wastewater Treatment Plant received a "Gold Peak Award" for not recording a single discharge of pollutants in the year. The East Bank Wastewater Treatment Plant won a "Silver Peak Performance Award". The awards were presented by the National Association of Clean Water Agencies (NACWA).

The S&WB was honored by NACWA at their summer conferences. Mention of the awards were included in the Clean Water Advocate News and the NACWA website.

Post-Katrina Work Ongoing

SAFETY AND RELIABILITY FOR CITIZENS ARE MAJOR GOALS OF S&WB'S MASSIVE SEWAGE COLLECTION SYSTEM UPGRADE

The Sewerage & Water Board of New Orleans began a major rehabilitation and capacity upgrade of its aging sewage collection system in 1996 called SSERP (Sewer System Evaluation and Rehabilitation Program.)

Since Katrina, under the SSERP Program, the SWB has completed 19 construction contracts for a cost of approximately \$34 million. Under these contracts, the Board has completed over 4,000 repairs to the sewer collection system. The sewer system repairs include the following:

1. Full line replacements from manhole to manhole
2. Full length lining of the line segment from manhole to manhole
3. Sewer main line point repair
4. Sewer service lateral point repair
5. Manhole rehabilitation

Like most of the nation's major metropolitan areas, New Orleans' underground water and sewer systems are at least 50 years old and, in many cases, up to 100 years old. Factors common to this area, such as unstable soil conditions and large numbers of tree roots, contribute to a higher-than-normal number of breaks and deterioration of the sewer pipes.

At a public meeting in 1996, the S&WB's staff and consultants provided details of a \$631 million multi-year program to the public, environmental, preservation and neighborhood groups, elected officials and the news media.

SSERP was eventually incorporated into a consent decree the S&WB signed with the

EPA in 1998 to ensure that system repair work was done on a fixed schedule. At that time, timetables and deadlines were established for the work.

SSERP is used to identify and address structural and mechanical deficiencies in the wastewater collection system.

A number of new processes are being used for the testing, including a state-of-the-art trenchless method which allows for rehabilitation of buried pipe and manholes without the need for excavation and the disturbance to residents that it causes.

Other testing methods are smoke and dye tests, water flow and rainfall monitoring, manhole inspections and surveys and closed circuit televising (CCTV) of the lines. Sonar technology is also employed to determine the condition of sewer lines that cannot be de-watered.

With the implementation of repairs identified and completed in SSERP, the S&WB will not only be in compliance with federal regulations, but it will also be accomplishing its goals of protecting the environment and increasing the sustainability of the sewer system.

Hurricane Katrina struck in 2005, causing extensive damage to the sewer collection system. As was evidenced by the extent of damage in the areas where SSERP repairs had not yet been completed, it was shown that



the work completed under SSERP is greatly improving the resiliency and dependability of the S&WB's sewer system.

SSERP work was interrupted due to the storm, and the S&WB invoked force majeure (conditions beyond control) with respect to its obligations under the Consent Decree.

Between 2006 and 2009, the S&WB presented to the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Justice revised schedules for SSERP, reflecting the disruption of work and new activities associated with recovery of the sewerage systems from the damages sustained in August 2005.

On March 22, 2010, the S&WB entered into a Modified Consent Decree (MCD) that maintains the same basic structure of the original 1998 Decree. The MCD set new schedules for completing the remediation of the sewer collection system.

The Sewerage & Water Board is responsible for the coordination of the numerous engineers and contractors carrying out the planning, design and construction of improvements to the sewer system.

As a result of initial planning, the city was divided into the following ten service basins: Lakeview, Central Business District/French Quarter (CBD/FQ), Gentilly, Uptown, Mid-City, Lower Ninth Ward, Carrollton, New Orleans East, South Shore, and Algiers. The sewer rehabilitation in the tenth basin, Algiers, is not required under the Consent Decree.

The S&WB has been in compliance with every aspect of the original Consent Decree. Four of the basins (Lakeview, Central Business District/French Quarter (CBD/FQ), Gentilly, Uptown) were completely remedied in accordance with the requirements of the Decree.

For the schedule and progress in the other districts, and the methods used to determine needs and the unique processes to repair the system, visit the S&WB website; www.swbno.org, then click on About the Board, click on Sewerage and click on GOSSERP.

SSERP expenditures to date are \$220 million including rehabilitation and capacity related design, construction, and program

management services.

Rebuilding New Orleans' Underground

Currently, the sewage collection system serves an area of approximately 86 square miles and a population of approximately 350,000. It consists of over 1,300 miles of gravity collection and trunk sewers ranging in size from 8-inches to 84-inches in diameter and over 120 miles of force mains ranging in size from 6-inches to 72-inches in diameter. There are 83 pump stations which help convey wastewater to the City's two wastewater treatment plants, one on the East Bank and one on the West Bank (Algiers) of the Mississippi River with a combined capacity of 132 million gallons per day (mgd).

The Sewer Rehabilitation Future

Thus far, the S&WB and its contractors have met the tight consent decree timeline for the initial phases of the project--most ahead of schedule.

At this time, discussions of future funding options are underway by the S&WB, its financial advisors and bond counsel. The future of SSERP, naturally, depends on the availability of funds to complete the projects in accordance with EPA deadlines to avoid large fines of up to \$15,000 per day.

The S&WB has kept the public informed of the SSERP projects through billing inserts, its website, news releases, media briefings, public hearings and meetings, special neighborhood meetings and participation in meetings scheduled by the Mayor or councilpersons.

Because of the high visibility of smoke and dyed water testing and televising of the sewer lines conducted in conjunction with the sewer evaluation surveys, the S&WB schedules special demonstrations of the tests prior to work beginning. Invited to the demonstrations are area residents, neighborhood and civic associations, environmental groups, elected officials and the media.

For more information regarding the S&WB's Sewer System Evaluation and Rehabilitation Program (SSERP) visit the SSERP website at www.gosserp.com.

WETLANDS ASSIMILATION PROJECT IN ORLEANS & ST. BERNARD TO RESTORE BAYOU BIENVENUE WETLANDS IS MOVING FORWARD FOR THE BENEFIT OF BOTH PARISHES

Mayor Mitchell J Landrieu, on the day he led groundbreaking ceremonies marking the start of a unique environmental project to restore areas of Bayou Bienvenue (Central Wetlands Unit), said this was a good example of two parishes working together for the betterment of both.

The Bayou was severely damaged by Katrina's salt-water surge from the now-closed Mississippi River Gulf Outlet (MRGO).

Construction on the project is well underway and progressing on schedule.

Joining the Mayor were representatives of St. Bernard Parish and officials from the Sewerage & Water Board, the City and State and community leaders from the area.

The Wetlands Assimilation Project, the brainchild of the S&WB's Environmental Affairs Division, is an innovative partnership between the Sewerage and Water Board and the St. Bernard Parish government to restore 20,000 acres of Bayou Bienvenue.

The restoration includes planting Bald

Cypress and Tupelo trees to enhance wetlands growth. Established trees will aid in wetland stability, water filtration and storm protection in the future

The project is designed to re-establish cypress swamps that will help protect Orleans and St. Bernard parishes from future storm vulnerability because wetlands and barrier islands can take the brunt of a storm.

The Mayor later said "This project is an environmental journey into new territory which is already getting the attention of scientific groups from across the country."

St. Bernard officials say they are pleased to be in partnership with the Sewerage & Water Board in this giant step forward to discover effective methods of restoring or building new wetlands for maximum protection for both parishes.

Marcia St. Martin, S&WB Executive Director, said, "I am very proud of our employees who saw an opportunity, brought it to management and, once approved by the Board of Directors, moved full speed ahead.





Installation of turbine # 4 is well underway

POWER PLANT IS HEART OF OPERATIONS, PROVIDING POWER TO SEWERAGE, DRAINAGE AND WATER SYSTEMS

The Sewerage & Water Board, since its founding in the early 1900s, has always had its own power source to operate its systems in case of a failure of commercial power or the non-existence of an external source of power.

Until Katrina, the Power Plant had never completely gone out of service, but when the plant flooded during Katrina; the Board's main source of power was destroyed.

But the men and women of the S&WB remained on the job to immediately begin repairing and restoring the plant so that, among other priorities, the city could be de-watered in record time by the massive drainage system. Power was also needed to run the water and sewerage systems.

All of the employees are highly skilled, experienced and dedicated, with a great knowledge

of the plant's operations and capabilities.

Power can be distributed to the water, sewerage and drainage systems as needed, demonstrating the flexibility built into the plant and the underground conduit system to send power throughout the system.

Since Katrina, millions of dollars have been invested in the plant, and there are more funds yet to come. The plant has since performed without problems during Hurricanes Gustav and Isaac due to those improvements.

And there is more support coming for the Power Plant.

Since taking office, Mayor Mitchell J. Landrieu has worked to secure federal resources to keep customer rates as low as possible. He, working with the Board, recently secured over \$141 million through the Hazard Grant Program of which \$19 million in projects are

underway.

Recognizing the importance of the Power Plant to the Board's operations, FEMA has also provided \$37.7 million through the Public Assistance Program (of which \$15.5 million went for projects completed and \$22.2 million is for work to be done). We also received \$141 million in Hazard Mitigation Grant funds from FEMA for the Power house. This is an addition to the above dollars.

One such major project underway at the Power Plant is the full repair of Turbine No. 4, which was badly damaged by Katrina. The 20,000 Kilowatt steam turbine generator will increase the output at plant and provide back-up in case problems develop with one of the other turbines..

Electrical energy for the operation of the water plant, the sewage pumping stations and the drainage pumping stations is generated at the water plant and distributed to the various

points of consumption over the Sewerage and Water Board's own transmission system. During rainstorms, practically all power is transmitted to the drainage pumping stations by underground feeder which are not subject to lightning, wind and other hazards that cripple overhead transmission lines and cause power failures. Reliability of drainage pumping stations is therefore increased.

The Power Plant maintained and operated at the water plant has a 61,000 kilowatt capacity, an output sufficient to serve the electrical needs of a city of approximately 80,000 people.

Emergency generation is provided at various critical locations for power to supplement or replace the commercial utility services in the event of hurricane conditions or power outages. The emergency generation is provided by diesel engine-driven generators, which provide power for essential loads in sewage treatment, drainage and within the main power generation complex itself.

Turbine No. 3, a crucial element of the Sewerage & Water Board's own Power Plant, has undergone an extensive overhaul after it failed while in operation. The 1928 vintage, 25-cycle, 15-megawatt generator supplies 25-cycle power for low day-to-day power needs, as well as for peak potential loads to run drainage pumping stations during heavy rain events and hurricanes. Disassembly and repair were required to ensure the turbine will return to service in like-new condition and provide many more years of reliable service.



UNIQUE PARTNERSHIP ADDRESSES CRITICAL S&WB SUCCESSION PLANNING – CREATES ECONOMIC OPPORTUNITIES FOR CITY’S YOUTH

In the summer of 2010, the Sewerage and Water Board of New Orleans forged a unique partnership with the not-for-profit training provider, Limitless Vistas, Inc. to provide classroom and hands-on job training for at-risk youth in the water and wastewater treatment industries. The partnership not only provides economic opportunities for New Orleans’ youth but also addresses the Board’s critical need for succession planning as its existing workforce approaches retirement.

When presented with the training partnership concept by Limitless Vistas, Inc., S&WB Executive Director Marcia St. Martin embraced and nurtured the partnership by providing training facilities and staff support. Additionally, Veolia Water North America

Operating Services, LLC (Veolia) which operates the Eastbank and Westbank Wastewater Treatment Plants provided internships for 10 students for practical applications. Program participants received training on water treatment, water distribution, water production and wastewater collection, spending 128 hours in the classroom and another 300 hours working in the field. During the 4-week internship students rotated through duties which include taking water samples and testing the water for various chemicals used in the water purification process.

With the success of the pilot training program in New Orleans, the Environmental Protection Agency (EPA) recognized the need for water operator job training and consequently in 2011 awarded Limitless

Limitless Vistas, Inc. water and waste water treatment training program students participate in 4-week internship with Veolia.





Thomas Lobell, chemical house supervisor and Charles Collins, S&WB employee and graduate of the job training program

Vistas, Inc. with a two-year grant to maintain the program. The EPA awarded Limitless Vistas, Inc. with a second two-year grant for the program in 2013 which provides \$200,000 over a two year period to train 40 at risk young adults and place a minimum of 32 program graduates in environmental jobs.

At a press conference held at the S&WB East Bank Wastewater Treatment Plant to announce 2013 EPA grant recipients, Sam Reynolds, EPA Region 6 Job Training Grant Project Manager said he was “highly encouraged that S&WB and Veolia Water would take such an active interest in reaching out to the Limitless Vistas, Inc. Water and Waste Water program.” He added, “It’s critical that industry and other end users of EPA funded programs be at the table and engaged and this partnership accomplishes that”. Mathy Stanislaus, assistant administrator for the EPA’s Office of Solid Waste and Emergency Response added, “People want and deserve both a healthier environment and greater economic opportunity.”

According to Marcia St. Martin, “This partnership in the training of water and wastewater operations through Limitless Vistas helps to address the critical need for succession planning as our workforce ages. It also prepares

our young people for sustainable entry level jobs so they become vital participants in the water and wastewater industry.” Limitless Vistas, Inc. Executive Director Matilda Tennessee added, “Students are introduced to the technical aspects of environmental work as well as the value of working in their communities, through service learning.”

Kevin Servat was Senior Project Manager, at the time, at Veolia Water-New Orleans. He saw these internships not only as a way to help the community but also ensure the growth of the industry. Certified water and wastewater operators are difficult to find. The water and wastewater workforce is getting older and new younger skilled laborers are needed in the field. The partnership agrees there is no better way to give back than to invest in the education of the city’s youth.

Recently, the S&WB hired its first program graduate. Charles Collins is working in the Chemical House at the S&WB Carrollton Water Purification Plant. Collins credits the training partnership with preparing him for a life-long career in the industry.

HURRICANE ISAAC CAN'T DAUNT RESOLVE OF S&WB EMPLOYEES

As Hurricane Isaac moved ashore on the eve of the seventh anniversary of Hurricane Katrina, the Sewerage & Water Board had 345 employees on duty around-the-clock working to keep its power system running, drainage pumps operating, and water services available to New Orleans residents and businesses. Packing sustained 80 mile per hour winds, the Category 1 storm was far less powerful than Hurricane Katrina, however, Isaac's large size and slow, 8 mph procession produced a sizable storm surge and significant rainfall resulting in widespread street flooding and downed power lines.

In response to Hurricane Isaac, President Obama declared states of emergency in Louisiana and Mississippi, Louisiana Governor Bobby Jindal activated 4,200 members of the National Guard, and the Red Cross opened 18 shelters in Louisiana. In the aftermath of Hurricane Isaac

damages have been estimated at upwards of \$2 billion – far less than the \$45 billion in damages produced by Hurricane Katrina when levee breaches caused 80% of the city to flood. The levees and floodwall system in New Orleans was rebuilt by the U.S. Army Corps of Engineers at a cost of \$14.45 billion and protected the city from massive flooding from Hurricane Isaac. The storm did, however, trigger street flooding, downed trees, road closures, airline cancellations and power outages to approximately 75% of the city.

Although Hurricane Isaac lingered over New Orleans for two days pouring 9 to 12 inches of rain on the city, the Sewerage & Water Board drainage system continued pumping at full capacity. Its 24 drainage pump stations operated consistently, being powered by on-site generators or electricity from the board's own power plant. As a result, rainwater was quickly

S&WB workers load a truck at Sewer Pump Station A in Armstrong Park with equipment and fuel





After passage of Isaac, Executive Director Marcia St. Martin and Emergency Management Director Jason Higginbotham discuss plans for the aftermath initiatives.

drained from City streets, the potable water system provided uninterrupted protection from the danger of fire, toilets flushed and showers worked. In addition to the 24 drainage pump stations, the Sewerage & Water Board operated 2 Potable Water Purification Plants, 2 Waste Water Treatment Plants, 2 Power Generation Plants, 83 Sewerage Pumping and Lift Stations, and more than 100 miles of Power Transmission and Distribution Lines during and after the storm. Additionally, the Board afforded ongoing assistance to the Plaquemines Parish Public Works Department by providing manpower to aid the parish in manning pumps dewatering Plaquemines Parish.

According to S&WB Executive Director, Marcia St. Martin, the successful performance of New Orleans' rebuilt storm protection system during Hurricane Isaac, is an important confidence builder for area residents and businesses. Sewerage & Water Board flood protection defenses include a pumping system with the capacity of over 30 billion gallons a day, enough to empty a lake 10 square miles by 13.5 feet deep every 24 hours. About \$1 billion has been spent since Katrina repairing and modernizing the pump stations. "The city pumps are able to push out 50,138 cubic feet of water per second - enough to fill the Mercedes-Benz Superdome in seven minutes,"

said St. Martin.

"It's a well-rehearsed, extremely well-exercised system," said St. Martin. "Twenty-four large drainage pumps throughout the city - some more than 100 years old - are designed to push rainwater out from city streets. The water is then sent to canals near Lake Pontchartrain on the northern edge of the city, where federally built pumps dump it to the lake."

To ensure power to operate its 24 drainage pump stations and 13 pump stations serving highway underpasses, the Sewerage & Water Board operates a 25 Hertz power generation plant and electrical distribution system to provide 60 megawatts of peak power. The electrical system began operation in the early 1900s at a time when much of the nation's railroad equipment was being built for 25 Hertz operation, and has been modified over the last century to meet the City's needs. Six (6) of the 60 Hertz-powered pump stations are also equipped with back-up diesel generators. In addition to draining the City of New Orleans, the system serves 22,000 acres of neighboring Jefferson Parish. The Interstate 10 pumps ensure that this critical pre-hurricane evacuation route and post-hurricane corridor for relief equipment and personnel is passable.



Mayor Landrieu held daily briefings and press conferences with all city departments and agencies to keep residents informed.



**AS THE STORM
CLOUDS BUILD,
S&WB PREPARES
FOR HURRICANE
ISAAC.
AUGUST 2012**

Some facilities have been equipped with boats for possible floods.

Staging of vehicles to higher ground.





**AS SOON AS
HURRICANE ISAAC
PASSED, THE CLEAN
UP & ASSISTANCE
BEGAN
AUGUST 2012**

S&WB employees assisting the residents of Venetian Isles.

Drainage pumping station operators discuss operations of the drainage system and the rainfall totals from slow-moving Hurricane Isaac.



S&WB working with the Department of Public Works to clean up streets.



“WE’RE ALWAYS HERE. WE NEVER LEFT.”

The 300 S&WB employees on emergency hurricane duty thought the worst was over when Katrina blew through New Orleans on August 29, 2005 with minimal rainfall and strong winds, but not as strong or damaging as predicted.

That same morning, reports of flooding began to come in—it was described as heavy, deep flooding. Reports came from employees at their duty stations and citizens from all parts of the City wondering if the massive S&WB pumping system was working.

Then the news came in—there were several floodwall failures in outfall canals along Lake Pontchartrain and the Industrial Canal, dumping millions, possibly billions, of gallons of water into some of the lowest parts of the City in an instant. Eventually, 80 per cent of the City was flooded.

The 300 employees on duty, and those who risked their lives to reach whatever Board facility needed help, knew a major catastrophe was taking place.

For the first time in the Board’s 110-year history, water service on the East Bank was interrupted when the Board’s power plant flooded, despite bold efforts by employees to build a sand bag barrier around it.

Efforts like this were taking place everywhere...even in drainage pumping stations where employees were stranded. Operators of two pumping stations on the Industrial Canal clung to rafters for days, with no food or water, until teams of employees and the Coast Guard could reach them.

Executive Director Marcia St. Martin said, “Some real heroics by our employees took place in the days after the flood to get systems up and running as quickly as possible.

“The 300 employees on duty and those who rushed to help did not know the fate of their families or friends who evacuated. But they did not leave. They did their jobs and did whatever they could to protect our facilities and help the struggling people of New Orleans.”

The heroic efforts of the Sewerage and Water Board employees were displayed as these

Rufus Burkhalter, now retired, is wet down with bottled water after fighting a fire at Drainage Pumping Station No. 6. The fire occurred during the recovery period soon after Katrina hit the city. Hundreds of S&WB employees, first responders after the storm, performed similar heroics to help get the systems up and running again. Pumping stations throughout the city were quickly repaired to help de-water the flooded parts of the city.



workers, even in the face of disaster, focused on their responsibility to keep the water, sewer and drainage system operating. They immediately understood that if there was no water, no sewer or no drainage services there would be no city of New Orleans.

In a speech Mrs. St. Martin delivered to a nationwide professional water group in 2006, she stated, “With so much destruction of our facilities, equipment and heavy truck fleet, we relied on the skill, expertise, knowledge and determination of our employees to put our water, sewerage, drainage and power systems back in operation.”

When experts said it would take months to de-water the system with our badly damaged drainage pumps, our staff was actually able to achieve the goal after breaches were closed, it took 11 days for the Sewerage and Water Board employees to dewater the city.

The extraordinary actions and reactions of the Sewerage and Water Board employees garnered international, national and local media attention as indicated in a *Times-Picayune* article in 2010.

In the lead-up to Katrina’s fifth anniversary, more than 50 water board workers and administrators gathered Friday inside Pump

Station No. 1 to retell survivor stories and to honor the work they’ve put in since, beginning with pumping the floodwater out of the city after the breaches were closed.

Many also bemoaned the fact that even though they report for duty during hurricanes just like other emergency workers -- and put in their most strenuous work during the height of storms, when others hunker down -- they don’t seem to get the same respect.

“Especially right after Katrina, nobody was paying attention to our operators,” said Bob Moeinian, Superintendent of Pump Stations. “Everything was about first responders: Police Department, Fire Department. And our folks, who were trying to help the city get up and running, you weren’t hearing much about.

“We kind of felt like we were left behind,” he said. “We’re always here. We never left.”

Nevertheless, the men and women of the Sewerage and Water Board are extensively trained to meet the challenges presented by extreme weather events. They remain prepared to risk their lives by working through storms, hurricanes, and flooding, knowing full well that the city’s survival and future existence depends on the availability of water, sewer and drainage services.

Flood waters from Hurricane Katrina submerged many of the giant motors which power the massive pumps of the S&WB’s Drainage System. Within three days of the storm’s passing, the Board had arranged for a team of experts from the General Electric Corporation to come to the City to work with S&WB staff to dry the motors and begin the re-winding process.





SEWERAGE & WATER BOARD EMPLOYEES WORKING THROUGH THE STORM

On September 26, 2005 National Public Radio (NPR) reported, “One of the untold success stories of Hurricane Katrina is how quickly New Orleans was able to pump out floodwaters. That work was done by the New Orleans Sewerage & Water Board. For three weeks, about 300 employees did the work of 1,000 — in the most harrowing of circumstances.”

Some 300 Sewerage & Water Board employees were working emergency hurricane duty when Katrina gusted through New Orleans on August 29, 2005 with mostly wind damage and minimal rainfall. The thought of “dodging a bullet” was, however, fleeting as reports from employees and citizens of heavy flooding started pouring in that same day. And although the drainage system has a 30 billion gallons per day or 50,268 CFS capacity, some wondered if the system built in

1903 had said ‘no more’.

Then the news came in and all the employees knew a major catastrophe was at hand. There were several floodwall failures in outfall canals along Lake Pontchartrain and the Industrial Canal, dumping millions, possibly billions, of gallons of water into some of the lowest parts of the City. Eventually, 80 percent of the City flooded.

As the flood waters continued to rise, the 300 S&WB employees struggled to keep the systems operating. “Some real heroics by our employees took place in the days after the flood to get systems up and running as quickly as possible,” said S&WB Executive Director Marcia St. Martin. “The 300 employees on duty and those who rushed to help did not know the fate of their families or friends who evacuated. But they did not leave. They did their jobs and did whatever they could to

protect our facilities and help the struggling people of New Orleans.”

For the first time in the Board’s 110-year history, water service on the East Bank was interrupted when the Board’s power plant flooded, despite bold efforts by employees to build a sand bag barrier around it.

A *Chicago Times* article from October 2005 reported the experiences of Chris Fontan and his coworkers as they worked desperately to get the plant back up and running. According to Fontan, a zone manager for the Sewerage & Water Board, the city cannot survive without water. “Pressurized water is crucial for fire protection. It cools the bearings in massive pumps that drain the city after floodwaters. Almost any industrial operation, including the electric utility, needs it to operate.”

After Katrina hit New Orleans on Aug. 29, it shut down the city’s Carrollton Purification Plant for the first time since it opened in 1906. Flooding at the huge facility on the city’s West Side took down the generators, and that shut down the pumps that send purified Mississippi River water to much of the city.

Not only does a lack of pressurized water leave the city vulnerable to fire and make it more difficult to pump itself out, but it also allows groundwater to seep into the system, contaminating the water supply.

In the first days after the storm, Fontan and others raced out in boats to shut off the main valves closest to the plant to help restore water pressure at the plant itself.

Meantime, Rudy St. Germain, chief of engineering, led a team that rigged an old steam boiler to power the pumps.

With people running back and forth through the flood waters to communicate between the

pump room and the control room, the team tried three times to start the system before the pumps finally came to life, sending clean water as far as the closed valves. This built pressure back up at the plant, stabilizing the situation.

The extraordinary actions and reactions of the Sewerage & Water Board employees



Katrina's rain pulled car into canal

garnered international, national, and local media attention. According to the national publication, *Public Works Magazine*, “After Hurricane Katrina tore through New Orleans, the U.S. Army Corps of Engineers direly predicted that it would take months to pump the water out of the city. Within a few days, though, the Sewerage & Water Board of New Orleans (SWBNO), founded in 1903, had restarted

most of its 24 drainage pumping stations and the water was receding. Within about three weeks, the city was mostly pumped out and ready to enter the next phase of its recovery.”

The heroic efforts of the Sewerage & Water Board employees were displayed as workers, in the face of disaster, focused on their responsibility to keep the water, sewer and drainage system operating. They knew if there was no water, no sewer or no drainage there would be no city of New Orleans.

The Winter 2006 edition of the *Tulanian*, highlighted the efforts of Gerald Tilton, a 24-year veteran of the S&WB. Tilton, rode out Hurricane Katrina at Pumping Station 19 adjacent to the Industrial Canal in the Ninth Ward.

His job is to make sure things are running well, dealing with operational concerns, maintenance and personnel matters.

On Monday, Aug. 29, things were not running well.

“Water came over the floodwall surrounding the station. It filled the pits in the station, and

the water kept rising and came within about a foot of the third level in the pumping station, which is raised about 15 feet high.”

At the back of the pumping station, Tilton and three pump operators walked in ankle-high water, fearing they might be electrocuted if the water rose higher. They dismantled the motor and blades of a big ventilation fan to make a potential escape hatch. But seeing a vortex of swirling water beneath the pumping station, they realized it would be impossible to escape the building. They started bringing food, water, cell phones and medications up a ladder to the top of a crane, which might be the only dry space if the water kept rising.

The next day, the workers at Pumping Station 19 peered into binoculars and across the Industrial Canal to Pumping Station 5, located in the Lower Ninth Ward.

“I saw some of my guys standing on an elevated balcony in water up to their chests. I could see water rushing back out of the Lower Ninth Ward, so I knew there was a breach in the levee system,” Tilton says. “It was a traumatic experience. I feared for my life and for the lives of the other workers. When I got a call from a supervisor saying we were on our own, that the Coast Guard weren’t coming, that the National Guard weren’t coming, and we could see the water rushing in, it looked like it was the worst-case scenario we had all



feared.”

Tilton and another man swam through the floodwater to the generator building next to Pumping Station 19, hoping to start the generator necessary for the pumps to work. Two feet down in the dirty, foul-smelling water were valves essential to the pumping operation that had to be opened. So Tilton and another man dove in.

Electrical panels destroyed by water



“Within 24 hours we were able to pump at 19, but it was fruitless,” Tilton says, noting that any water pumped into Lake Pontchartrain would return via the breach in the levee. “We had to wait for the break to be fixed.”

Eventually, the Industrial Canal breach was sealed and the Sewerage and Water Board was able to pump the floodwater out of the area. Then, only a few weeks later, came the threat of Hurricane Rita.

“Pumping Station 19 was the only one running in the old part of the city and I knew how to run it. We had done a real MacGyver job to get it up and running, with spit and bubble gum,” Tilton says with a wry smile.

It was more than a month before Tilton went to his home in the Hollygrove neighborhood of Carrollton to survey the damage there.

Tulanian Winter 2006

In the lead-up to Katrina’s fifth anniversary, more than 50 water board workers and administrators gathered inside Pump Station No. 1 to retell survivor stories and to honor the work put in since. In an October 2010 story covering that anniversary, *Times Picayune* reporter Michelle Krupa recounted one such story:

On Friday, Ricky Alexander recalled the moment before dawn on the Wednesday after Katrina that the two-way radio crackled to life inside his Algiers pump station.

Alexander, then a 26-year S&WB veteran, had heard about the catastrophic flooding across the river. And he had heard before bedding down the previous night that dozens of his colleagues were still stranded in S&WB facilities across the city.

But he’d also heard that boats and helicopters were expected to rescue them overnight.

As he heard the voice of pump operator Renauldo Robertson broadcasting from Pump Station No. 1, it became clear the plan had disintegrated.

“No one showed up,” Robertson said. “We need to get out of here. Is someone coming?”

“Do you need me to come and get you?” asked Alexander, who had brought his own boat with him to work.

“More than you know, Ricky,” his colleague said. “More than you know.”

Launching his boat from an Interstate 10 ramp at Earhart Boulevard, Alexander maneuvered the flooded city. He had to pass residents crying out for a ride, people balancing water containers on their heads as they waded through the water — and dead bodies afloat in the muck. He rescued his co-workers at the Broad Street pump station, ferried them to Algiers, then returned to check four more S&WB facilities before nightfall.

In a speech Mrs. St. Martin delivered to a nationwide professional water group in 2006, (page 39) she stated, “With so much destruction of our facilities, equipment and heavy truck fleet, we relied on the skill, expertise, knowledge and determination of our employees to put our water, sewerage, drainage and power systems back in operation.”

The men and women of the Sewerage & Water Board are extensively trained to meet the challenges presented by extreme weather events. They remain prepared to risk their lives by working through the storms, hurricanes, and flooding, knowing full well that the city’s survival and future existence depends on the availability of water, sewer and drainage services.



INTERNATIONAL WATER UTILITY PROFESSIONALS SHOW GREAT INTEREST IN SEWERAGE & WATER BOARD EMERGENCY RESPONSE TO KATRINA

(The following is from a March 13, 2006 speech presented by Marcia St. Martin, executive director of the Sewerage & Water Board of New Orleans, at a Water Quality Conference of the Association of Metropolitan Water Agencies. This information serves as a model response for similar catastrophes facing water utility operators.)

Like many of you and other water utility managers throughout the nation, the week of August 22nd through August 26th, 2005 was a typical one for meetings with staff, Board members and engineers working on a host of enforcement and environmental projects detailed in a consent degree my agency signed with EPA and DOJ in 1998.

It was the week following a meeting of our Board of Directors, so there were actions to be implemented and newly approved projects to be started.

Little did I know that in just a few days, one of the most devastating storms to ever strike the United States would thrust me directly into one of the most massive utility recovery and reconstruction projects ever undertaken by a City or a major utility like ours--The Sewerage & Water Board of New Orleans.

I, along with most members of my family, and 80 per cent of our 1,200 employees lost

our homes when several levees were breached, allowing a sea of water to flood 80 per cent of the City and destroying more than 200,000 homes and businesses.

The Sewerage & Water Board suffered massive losses of water, drainage and wastewater facilities, equipment, supplies, tools and numerous fleet vehicles, including heavy field equipment.

It is true...the devastation is so much worse than can be depicted in television reports or in newspaper accounts or photos. Even seasoned reporters, emergency experts, insurance company officials and Congressmen express disbelief upon seeing the destroyed areas for the first time.

Today we'll discuss the role of the Sewerage and Water Board in the City's full recovery, but first, let me give you some background on this unique and historical agency.

In 1896, a Drainage Commission was

Helicopter tries to plug the breaches with sandbags





When one of the pumps at Drainage Pumping Station No. 3 began to “chatter” and make a loud noise, it was discovered that 5 of the 8 impeller blades were cracked. The Board’s own employees from Facility Maintenance disassembled the pump, gouged out the cracked areas and weld-repaired the blades.

Additional work was done on the shaft while the casing was off. The pump, which has been in service for more the 80 years, was reassembled, test run and put back in service. The station is located at North Broad and the London Avenue. On many jobs, the Board’s employees can make repairs more cheaply and quickly than contractors not as familiar with the Board’s complex machinery.

organized to carry out a master plan for drainage developed by the City. In 1903, the commission was merged with the Sewerage & Water Board to consolidate sewer, water and drainage functions under one Board.

The Board membership is the Mayor, three councilpersons, seven citizen members with overlapping nine-year terms and two members of the Board of Liquidation, City Debt.

Today, the Drainage System consists of 24 major pumping stations with a combined capacity of 30 billion gallons per day or 50,268 cubic feet per second. The system can create a water flow to match that of the Ohio River. It drains 59,000 acres in the developed parts of the City and 2,250 acres in adjoining Jefferson Parish.

A network of subsurface drain pipes, 93 miles of covered canals and 82 miles of open canals transports runoff from the streets to the pumping stations.

The Water Department operates two water

plants, one on the East Bank of the Mississippi River and one on the West Bank, with a combined capacity of 270 million gallons per day.

Purified water is distributed to 143,000 service connections and 17,000 fire hydrants via 1,610 miles of mains.

The Board operates a state-of-the art Water Quality Lab capable of detecting 100,000 compounds, a necessity since our only source of raw water is the Mississippi River.

We operate two wastewater treatment plants--one on the East Bank and one on the West Bank--with a combined treatment capacity of 142 million gallons per day.

Three major pumping stations and 83 lift stations; trunk sewers and force mains transport effluent through the gravity collection system, which consists of 1,450 miles of lateral and trunk sewers.

The Board also operates its own electrical

generator plant, which can support all three systems. The 25-cycle plant has a 61,000-kilowatt capacity, an output sufficient to serve a city with a population of 80,000 people.

Now, with that background, I will detail for you the challenges the men and women of the Sewerage and Water Board faced immediately after the storm and what has been accomplished in the last six months.

We knew we had to face Katrina head on, using all the skills, training, experience, ingenuity, planning and dedication of our management and employees and the leadership and support of the Board of Directors.

Katrina's attack left many Board facilities, vehicles and equipment inoperable, completely disrupted normal communication channels and put the lives of many employees who were on duty in jeopardy.

A decision was made by top management early on to protect those assets not damaged and to focus on the business of providing water services (sewer, water and drainage) for the City of New Orleans and other communities devastated by the hurricane as quickly as possible.

Since the Board already had tried and tested hurricane plans and procedures in place for short-term hurricane rainfall runoff, we knew extraordinary and immediate action would need to be taken to offset this type of devastation... and destruction caused by the catastrophic levee breaches, which allowed water to flow into the city for days and remain in our "soup bowl" for weeks.

With a force of 300 employees already on duty, and many more reporting to duty in the next few days following the storm, a number of crucial actions were taken to begin restoration of the systems and to put business procedures in place.

Among them were:

- Establishment of a command center at the Algiers Water Treatment Plant on Aug. 31. The area had not flooded and the plant was in full operation, with power and phone service. The plant was also used to provide housing, food and water for employees on duty or reporting for duty.

It also served as a staging area from which food and water could be delivered to other employees at duty stations reachable only by boat or helicopter. Inoculations for tetanus and hepatitis a and b were also available to employees through the location.

Water produced at the plant was sold to FEMA via tanker trucks, which distributed it in New Orleans and other areas ravaged by the storm. 31,770,000 gallons were produced for sale to FEMA.

- On Aug. 30, we dispatched staff to the state's command center to secure diesel fuel to run the Algiers plant and other key operations and to obtain cement for a dam to prevent flooding of the Board's crucial electrical generating plant on the East Bank.

- On Sept. 5, we opened an administrative office in Algiers and another on Sept. 10, in Baton Rouge, located 80 miles west of New Orleans. The BR office gave the S&WB access to the state's command center where FEMA and other key agencies were set up.

- On Aug. 31, we contacted GE seeking specialists to help with damage assessment and emergency repair of drainage pumping stations and power plant turbines, motors and pumps. GE began work on Sept. 3.

- On Sept. 6, established a toll-free phone number for employees to notify management of where they were and how they could be reached for work assignments.

- Held first staff meeting on Sept. 6



to assess damage, outline an action plan and coordinate activities. Restoration of damaged systems began two days after the storm's passing.

- Set up special communications system through Central Control's radio system when all other forms of communications failed.

- By Sept. 3, key staff were located and 350 personnel were on duty to provide services throughout the City at drainage pumping stations, sewer plants, Central Yard, power plants, water treatment plants, Central Control, Water Quality lab and the Engineering Department.

- By Sept. 5, the Computer Center was functioning at the Main Building on St. Joseph St. to begin business processes and assist the field operations in any way possible with damage assessment and restoration.

- On Sept. 7, the Board sought assistance from FEMA for temporary housing, medical support, food, water and other provisions for staff who had been working constantly since the storm. FEMA began providing assistance on the East and West Banks via boats and helicopters on Sept. 9.

- Oct. 16 restored primary treatment at the East Bank Waste Water Treatment Plant.

- Leased a fleet of vehicles to replace those flooded when the levees failed. This allowed for staff to carry out duties in areas not flooded and other areas when they were drained.

- Nov. 16 restored secondary treatment at the East Bank Waste Water Treatment Plant.

- Worked with water, sewerage and engineering associations in posting the needs of area utilities on websites and seeking volunteers from the water profession to assist during the crisis.

There are many stories of heroics by our employees to keep their facilities operating at great risk, to help citizens fleeing their flooding homes and to save the lives of fellow employees.

But all of those employees who worked

during and after the storm are part of a special team, which is a major part of the process of participating in the most massive reconstruction and restoration project in the 107-year history of the Sewerage and Water Board of New Orleans.

All of this first stage work helped us achieve one of two primary goals--repair parts of the field systems so that services would be available to citizens and businesses and to accommodate the rebuilding and restoration of the City.

The other goal was administrative functions to assess damages, file for FEMA funds and insurance claims and to ensure that revenue was collected for those services still being provided.

As more and more people returned to the City, water would be needed for personal and safety needs, clean-up efforts and fire fighting.

Sanitary sewer service would help prevent disease and allow customers to live in areas, which did not flood and allow hotels, restaurants and other businesses to re-open.

Drainage, of course, would be needed to protect the City from flooding, should additional rainstorms occur.

A key element in the field and administrative recovery process is the Board's extensive Computer Center which generates operational and financial reports, provides budget reports, processes customer bills, analyses and tracks field work, maintains inventories of supplies, equipment and vehicles, does payroll and maintains the Board's email network and website.

The Center was operational almost immediately--just days after Katrina hit. Its capabilities were of great importance to management in assessing damages, tracking expenses, filing insurance claims, helping determine the extent of damage in the field and to communicate internally and externally.

Through computer-generated reports and analyses, management was able to quickly forge and carry out a comprehensive plan to restore



DPS # 6

services, file claims and to re-start a much-needed revenue stream.

I was pleased to report at the January Board Meeting of progress we have made in the field since the storm.

Though we had some \$300 million in damages on the East Bank of Orleans Parish, we are projecting that the sewer and drainage systems will be ready for the heavy spring rains.

Initial inspections of the East Bank water distribution system revealed some 3,900 leaks, many of which were from lines broken by tree roots when they were toppled by high winds. By March 5 approximately 11,853 breaks had been repaired by local contractors hired by the Board board forces and volunteers.

It is still important and a priority to repair the leaks quickly to ensure a safe supply of potable water to all parts of the City and to prevent the costly waste of water.

The Federal government will pay 80 per cent of the \$300 million for these and other repairs.

We suspect that many leaks that are draining the underground pipe system of millions of gallons of water daily have yet to be found, especially in parts of the Lower 9th Ward.

We know we're not finished, because we are pumping 120 million gallons a day, but our population should be using about 40 million.

An inspection of 92 percent of the East Bank's sewer system lines has shown that about half of the system still is blocked, either because water remains in the pipes or because there is no electricity in the area to power the pumps to move the water. To solve the problem, we are using emergency discharge systems or generators to make the pumps work. The process, known as bypass pumping, is under way or complete at 18 stations, and preparations are being made at seven more.

At this point after Katrina's Aug. 29 impact, we estimate that the board would be collecting about 30 percent of what it had received before Katrina to provide funds the board needs.

With leaner income in mind because of a drop in revenue from this source, the board has approved a budget for this year that, at \$96.5 million, is almost 19 percent below the 2005 figure of \$118.8 million.

Even though customers may not be occupying their pre-Katrina homes, everyone still owes a flat fee for S&WB services, even though the other part of the bill, for usage, would be virtually nil.

To get an even better grasp on the future customer base and revenue projections, we are embarking on a study to best determine what a pre-Katrina population of 500,000 will be in the future.

We will use flood maps, overlaid by pre-Katrina zip code delivery figures, to determine the per cent of population living in the City. This,

combined with actual water usage from meter reading in a zip zone, should give us a base for accurate revenue projections.

The Board expects 30 per cent of Pre-Katrina revenue and recovery expenses of 200 per cent over normal expenses.

So with the expected loss of revenue and increased costs for restoration, the Board is restructuring its debt, will borrow from the Community Disaster Program and continue to apply for disaster funds.

Before I close today, I would like to take this opportunity to publicly and sincerely thank three water utilities who answered our urgent call for help in the days and weeks after the storm struck.

While we received numerous offers of assistance from throughout the nation, the help these three groups could provide best

THERE ARE MANY STORIES OF HEROICS BY OUR EMPLOYEES TO KEEP THEIR FACILITIES OPERATING AT GREAT RISK, TO HELP CITIZENS FLEEING THEIR FLOODING HOMES AND TO SAVE THE LIVES OF FELLOW EMPLOYEES.

matched our needs at the time. They are The Portland (Oregon) Water Bureau, The Lafayette (Louisiana) Utilities System and Central Arkansas Water, which serves Little Rock.

Lafayette Utilities dispatched pipeline crews and equipment to help repair numerous breaks in major water lines caused by roots from trees toppled by high winds. Restoring water service and pressure was crucial for citizen needs and to fight fires occurring throughout the City.

Lafayette also ran hundreds of bacteriological samples from the water supply system at its lab, allowing the Sewerage & Water Board to advise citizens of the quality of water in various parts of the City.

The Little Rock crews supplied staff, equipment and four gate trucks and greatly helped us in the repair and replacement of valves and pipelines.

I will go into more detail of the Portland team's work, because their plan is being cited as a model for future disaster assistance for major catastrophes.

Their response included a fleet of gate and maintenance trucks and backhoes and a 35-member emergency response team trained

in operations and damage assessment required by FEMA to ensure loss reimbursement under its Public Assistance Program.

The Portland initiative is different than others, which provide short-term help. Its self-contained team is prepared to stay for weeks with its own rations and emergency shelter.

The efforts of these three outstanding utilities are greatly appreciated by our Board, staff and the citizens of New Orleans. Their help was invaluable.

Thank you for allowing me to address you today and to describe what we experienced in New Orleans from Hurricanes Katrina and Rita.

I will also tell you that the men and women of the Sewerage and Water Board, our Board of Directors, our citizens and elected officials are all committed to the full renovation and restoration of our systems and one of the greatest, most resilient and unique cities in the nation--New Orleans..

We are determined to accomplish our long-term goal of "Tackling The World's Toughest Water Challenges."

Come visit us soon.



OUR MISSION IS TO PROVIDE SAFE DRINKING WATER TO EVERYONE IN NEW ORLEANS; TO REMOVE WASTE WATER FOR SAFE RETURN TO THE ENVIRONMENT; TO DRAIN AWAY STORM WATER; TO PROVIDE WATER FOR FIRE PROTECTION; TO PROVIDE INFORMATION ABOUT PRODUCTS AND SERVICES; AND TO DO ALL OF THIS CONTINUOUSLY AT A REASONABLE COST TO THE COMMUNITY.

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