

**MINUTES OF  
SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY-EAST  
COASTAL ADVISORY COMMITTEE MEETING  
HELD ON MAY 20, 2015**

PRESENT: G. Paul Kemp, Chair  
Rick Luettich, Committee Member  
Albert Gaude, Committee Member  
John Lopez, Committee Member  
Carlton Dufrechou, Committee Member

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The Coastal Advisory Committee (CAC) of the Southeast Louisiana Flood Protection Authority-East (SLFPA-E or Authority) met on May 20, 2015, in Meeting Room 201, Orleans Levee District Franklin Administrative Complex, 6920 Franklin Avenue, New Orleans, Louisiana. Mr. Kemp called the meeting to order at 2:00 p.m.

**Opening Comments:** None.

**Adoption of Agenda:** The agenda was adopted as presented.

**Approval of Minutes:** The minutes of the March 19, 2015 CAC meeting were approved.

**Public Comments:** None. Mr. Kemp encouraged participation by the public during the meeting.

**New Business:**

**A. Recommendations on pre-armoring levee lifts.**

Robert Turner, SLFPA-E Regional Director, advised that he has been working with the Coastal Protection and Restoration Authority (CPRA) and U.S. Army Corps of Engineers (USACE) to firm up the preliminary decisions on the reaches to be raised prior to armoring. Mr. Turner stated that he met several weeks ago with General Michael C. Wehr, Mississippi Valley Division Commander, to discuss armoring and the USACE's requirements for the permitting of levee lifts prior to armoring versus allowing the USACE to do the construction. According to data provided by the SLFPA-E's surveyors, the levee sections recommended for lifts prior to armoring are at or near the required hydraulic elevation for this year. As the sea level rises and subsidence occurs, the depth of the water near a levee gets deeper, which effects wave heights and storm surge. The USACE determined that with the sea level rise and subsidence that is anticipated to take place by 2057, a levee height increase of one to one-and-a-half feet will be required in some areas over the 50 year period in order to meet the 100-year design elevation. The levees were originally constructed in the 2011-2012 timeframe about a foot above the required hydraulic design elevation. The levees have settled and the hydraulic requirement has increased. The levee reaches recommended for lifts

prior to armoring are LPV 00.2, LPV 01.1, LPV 02.2, LPV 19.2, LPV 20.1, LPV 109.02a and LPV 111.01.

Mr. Turner discussed the settlement of the various levee reaches. The SLFPA-E is looking closely at LPV 109.02a because the USACE's original calculations did not include the wave berm fronting the levee and recent additional information provided by the USACE indicated that a lift would not be required for 10 to 15 years. Additional measurements will be taken on LPV 111 to ensure that the observed settlement information is correct since the levee was constructed using deep soil mixing and there was an uncertainty relative to the bench mark numbers that were used when the levee was constructed. The draft resolution to be presented to the Board would allow the Regional Director to proceed with the analysis of the design of the lifts for the recommended levee sections and to develop a Memorandum of Understanding (MOU) with the CPRA for some of the geotechnical work. The CPRA developed a relatively short method for determining the factors of safety using CPTs rather than doing soil borings. A monetary contribution would be required for the geotechnical work. The Board would be informed about any determination made during the design process that a levee section does not require a lift, and upon agreement by the Board, the USACE would be notified that it can proceed with the armoring of the section. A profile of the levees was accomplished in December, 2014, and surveyors are in the process of collecting additional data, such as cross sections, required for the analysis. After the survey and geotechnical work is completed, a 408 Permit request must be submitted to the USACE. Funding has been set aside by the East Jefferson Levee District and Orleans Levee District in order to go forward with the levee lift projects assuming that nothing of significance is unexpectedly found.

Mr. Turner explained that the emergency supplement appropriations that funded the Hurricane and Storm Damage Risk Reduction System (HSDRRS) provided authority to the USACE to design and build a system that could be certified to meet National Flood Insurance Program (NFIP) requirements. Historically, the Federal government participated in the cost of levee lifts. When the USACE began the design of the HSDRRS it anticipated that this situation would continue and the Project Partnering Agreement (PPA) excluded levee raisings to account for sea level rise and subsidence from the local sponsor's operations and maintenance responsibilities. The HSDRRS was to have a 50-year design life with the levees being lifted over time. The floodwalls in the HSDRRS were designed and constructed to meet a 50-year design life. After the levee designs were completed, the USACE's attorneys determined that the supplementals did not include a provision for Federal participation in future levee lifts. The problem concerning Federal participation in the levee lifts was identified about two years ago and the SLFPA-E began working with the Louisiana Congressional Delegation for a remedy. The language subsequently included in a Water Resources and Development Act (WRDA) called for the Secretary of the Army to cost share future levee lifts on the HSDRRS provided a General Reevaluation Report (GRR) is completed and has three positive findings: the project is feasible, economically justifiable and does not cause any environmental problems. However, money must be appropriated by Congress to fund the GRR (cost shared 50% federal/50% local). There is some

question concerning the potential finding in a GRR relative to the economic justifiability of an incremental levee lift. General Peabody informed General Walsh in a memorandum that by 2016 several levee sections would fall below the required NFIP 100-year elevation; therefore, the HSDRRS would no longer be certifiable. The USACE is at this time in the process of armoring the HSDRRS. The potential risk of delaying the armoring on the aforementioned levee sections was briefly discussed. Mr. Luettich pointed out that the risk is lower if the levee sections are raised at this time prior to armoring than if the levee sections are raised several years from now and the armoring is removed in order for the construction to take place.

Dr. Lopez offered a motion, which was seconded by Mr. Luettich and unanimously adopted, to recommend that the Board adopt the resolution that was presented to the CAC.

**B. Presentation on archaeological methods used to detect buried infrastructure and near surface conditions - Tremaine & Associates**

Mr. Kemp explained that the CAC has been attempting to understand and examine methodologies that could be used to track levee conditions, such as settlement and consolidation, over a period of time. On a recent trip to California he met John Lopez, co-owner with Kim Tremaine of Tremaine & Associates, Inc. (Tremaine). He stated that Tremaine was doing geophysical surveys of the levees in the Sacramento Valley and has a technology that may be relevant to the SLFPA-E's efforts.

John Lopez advised that Tremaine has been in business since 1994. Mr. Lopez and Kim Tremaine are archeologists who initially developed technology for the location of buried archaeological sites. Tremaine combined a number of technologies and followed conventional archaeological practices in order to locate two lost historical buried sites without the use of excavation. After using and improving the technology over a number of years, Tremaine was asked by the USACE to use the technology to locate buried tunnels along the U.S.-Mexican border. Thirty-one tunnels were found between San Diego and El Paso, Texas. The USACE then requested that Tremaine build a super version of its technology for use in the Iraq and Afghanistan wars. The instrument emitted a large electro-magnetic signal. Underground objects responded to the signal and emitted a unique response that was picked up and used to identify objects and underground conditions. Tremaine was able to cover approximately 70-80 miles a day to a depth of 30-40-ft. Surface elevations and voids were mapped.

Mr. Lopez explained that the newly development instrument for which permission was received from the Army for commercial application is capable of reaching a depth of 25 to 35 meters and can travel at freeway speeds. The instrument measures response patters and is capable of detecting objects under any condition.

Kim Tremaine explained that continuous high density geophysical data is integrated with historic contextual data. The technology can be used to screen risks, evaluate particular issues and monitor changes over time. Tremaine's goal is to provide targeted

information for less cost and improve the management of flood risks by finding hidden structural defects. Fine grain baseline data is rapidly collected by looking at apparent conductivity and magnetic susceptibility. An array consisting of a transmitter and three receivers are towed by an ATV collecting the two different soil properties. The technology is integrated with other types of technology (ground penetrating radar or seismic technology) and the data fused in order to produce greater accuracy. The technology can be used to direct the placement of bores. Ms. Tremaine discussed Tremaine's work in the San Wakeen Valley in California and St. Louis, Missouri, their ability to locate various historical underground objects, and analysis examples. The technology can assist with risk reduction by providing more data, fewer assumptions, improved understanding and better allocation of resources.

Mr. Lopez advised that the estimated cost is \$600 to \$1,800 per line mile. Ground penetrating radar or seismic data can be used to constrain the conductivity models to produce finer detailed results than can be achieved by a single instrument. Tremaine has the capability of examining and evaluating the data while in the field in order to determine whether additional data collection is needed. The typical process includes pre-field research, the development of expectations and a sampling strategy, data collection and data processing. Mr. Lopez reviewed a cost matrix based on the types of technology that are utilized and the desired data. He explained that the technology was developed to produce results that are self-evident. It was important to the Army when the technology was developed that the readings would be similar, if not identical, for the same type of object or void regardless of the external or ground conditions. There are a number of algorithms or methods through which the data can be run to aid interpretation and data mining. Mr. Kemp noted that a sophisticated storage capability and access to algorithms that can parse through the data would be required in order to use this bundle of technologies. Mr. Lopez pointed out that the client would have to determine who is going to manage the system and the security measures to be put in place.

Mr. Kemp discussed doing a potential demonstration project (perhaps 10 miles of levee) later in the year using a mix of different instruments. The data would be analyzed to determine its usefulness. A subset of the instruments could be used on longer levee reaches based on the analysis.

There was no further discussions; therefore, the meeting was adjourned at 3:50 p.m.