



RECERTIFICATION OF RAPIDES AREA LEVEES

Red River Levee System

Alexandria City Council Chambers

24 February 2010 – 10 am

INTRODUCTION:

As part of the Federal Emergency Management Agency's (FEMA) Map Modernization Program, the Red River, Atchafalaya, and Bayou Boeuf Levee District (RRABB) and the Nineteenth Levee District (19th) are required to certify existing levees shown on the Flood Insurance Rate Map (FIRM) in our system. These levees are currently providing protection against the base flood (1% annual chance).

Who's got the ball?

The jurisdiction for levees in these matters falls within the authority, ambit, and scope of the levee districts involved. This is provided for both constitutionally and statutorily. These bodies can contract with other bodies pursuant to the Local Services Law and other provisions. A levee district means a political subdivision of this state organized for the purpose and charged with the duty of constructing and maintaining levees, and all other things incidental thereto within its territorial limits.



Two districts pertain here:

RRABB—

Red River, Atchafalaya, and Bayou Boeuf Levee District— The territory contained in the following boundaries: Beginning at the junction of the Red and Atchafalaya Rivers in the parish of Avoyelles, on the east then following the Atchafalaya River, to the mouth of Courtableau in the parish of St. Landry, then following Bayou Courtableau and Bayou Beouf to the line of the parish of Rapides, and all territory subject to overflow contained in the parishes of Avoyelles and Rapides, as well as that included in the described limits situated in the parish of St. Landry, including particularly the following:

(a) All that portion of alluvial lands in the parish of Avoyelles embraced and situated within the following described boundaries: All the territory in Avoyelles Parish consisting of alluvial lands subject to overflow, bounded by Red River, the Atchafalaya River, Bayou des Glaizes, and the public road running from David's Ferry, on Red River, to Bayou des Glaizes, by way of Marksville, Mansura, and the Long Bridge at Bout de Bayou;



(b) All that portion of the alluvial lands in the parish of Avoyelles lying north of the Red River and situated within the following described boundaries, namely: All the territory in Avoyelles Parish, consisting of the alluvial lands subject to overflow and embraced within the following limits: beginning at Cassandria on the line between sections 44 and 50, T3N-R3E, thence down Red River to Saline Bayou; thence following the Saline Bayou, Saline Lake, and Horespan Creek to Line between sections 17 and 18, T4N, R3E; thence south to the Point Maigre Hills and following the east edge of the hills to point of beginning;

(c) All the area in the parish of Rapides lying between Red River, Bayou Rapides, and Bayou Jean de Jean, and also there shall be included within the Red River, Atchafalaya, and Bayou Beouf Levee District all of the property included within the corporate limits of the town of Pineville, Rapides Parish, Louisiana, whether the same is actually subject to overflow or not;

(d) All the alluvial land now subject to overflow, or that has been overflowed, directly or indirectly, by the waters of the Red River in any year since 1865 on the left descending bank of Red River situated in the parish of Rapides, having for its northern boundary the southern boundary of Grant Parish and for its southern or lower boundary, the hills opposite the left bank of Bayou Rigolette, and following the hills to the upper side of the St. Louis Iron Mountain and Southern Railway right of way and following the right of way to Red River.



(e) There shall be excluded from the limits of the levee district the following: All that portion of St. Landry Parish lying west of the Atchafalaya River main levee and east of the west guide levee of the West Atchafalaya Floodway as now established extending from Avoyelles Parish line on the north to Bayou Courtableau on the south, with the exception of rights of way and other property belonging to railroads, pipelines, common carriers, or other public utilities.

19th—

Nineteenth Louisiana Levee District— All of the alluvial land subject to overflow on the left descending bank of the Red River in Grant Parish and all of the alluvial land subject to overflow along the tributaries of the Red River in Grant Parish downstream from the mouth of Bayou Nantachie.



RED RIVER LEVEE REACHES

- **Left Descending Bank**

- **Nantachie Lake to Pineville**

- **Federal Levee – not a system levee**

- **River Mile 87 to 123 (36 miles +/-)**

- **Insufficient Freeboard**

- **Approximately 4500' in total**

- **Cost of Repair – TBD**

- **Certification Cost - \$45,000/mile = \$1,620,000**



Freeboard is defined as the distance between the top of channel containment and the 100-year design flood water elevation.

Insufficient freeboard is therefore a deficiency in this regard.

The Corps can mitigate against this problem in several, oftentimes conjunctive manners:

- **Perform remedial work by modifying the existing floodwall**
- **Constructing a new floodwall**
- **Raising a portion of the levee.**



RED RIVER LEVEE REACHES

- **Right Descending Bank**

- **Bayou Jean de Jean to Moncla Bridge (LA 107)**

- **Mississippi River and Tributary System Levee: River Mile 59 to 107 (50 miles +/-)**

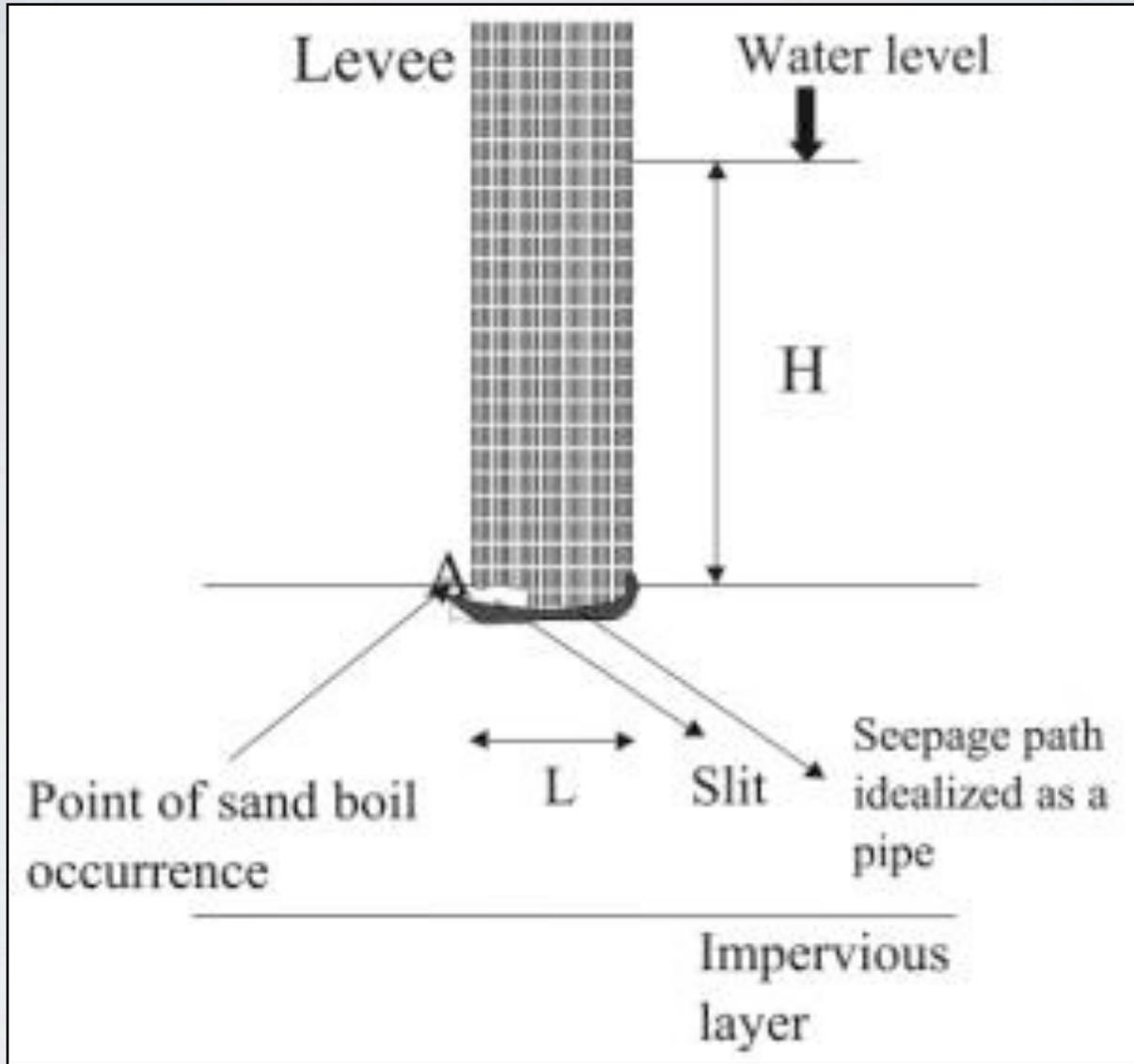
- **Five sand boil locations: Reach 1 - River Mile 96.5; \$650,000; Reach 2 - River Mile 93; \$1,100,000; Reach 3 - River Mile 81.3; \$475,000; Reach 4 - River Mile 75.5; \$850,000; Reach 5 - River Mile 59; \$375,000**

- **Total Cost of Repair - \$3,450,000**

- **Certification Cost - \$45,000/mile = \$2,250,000**



SAND BOILS



SAND BOILS CONT'D...

The U.S. Army Corps of Engineers states:

When floodwaters are higher than the land, the groundwater, under pressure from the river, exerts an upward pressure on the land inside the levee. With time this increased “head pressure,” as it is known to engineers, can drive groundwater through the underside of a levee to the surface.

This is expected and called “underseepage.” When water stands against an earthen levee for a long time, underseepage is expected to occur. In fact, investigations into the occurrence and control of underseepage are a major consideration of the Geotechnical design of a flood protection system.

Underseepage that allows clear water to reach the landside of the levee is not a problem. It is not even uncommon to see an area of dampness in an otherwise dry field when this happens. In fact, you may even see hundreds or thousands of ‘pin boils,’ small watery bumps that look like a water fountain with insufficient pressure.

When flood waters remain high for a long time though, underseepage can increase in volume and velocity and begin the destructive process of moving sand from the foundation, through the ground, to the surface, forming ‘sand boils.’



SAND BOILS CONT'D...



SAND BOILS CONT'D...

According to the Corps, here's how we deal with boils:

Most commonly, relief wells or landside seepage berms are used. Less commonly we use of a sheetpile cutoff or slurry trench cutoff.

Relief wells allow groundwater to flow out of the aquifer, thereby reducing the head-pressure in the aquifer. This pressure reduction decreases the upward seepage through the landside clay blanket and preserves the integrity of that blanket.

Seepage berms allow some of the excess seepage pressure to bleed through the surficial clay blanket and into the berm. There, the seepage flows horizontally to the end of the berm. The downward weight of the seepage berm also counteracts the upward seepage forces acting on the surficial blanket. Finally, the width of the seepage berm makes the underseepage travel a longer distance from the levee. The longer seepage path reduces the power and force of the underseepage so that when it does exit landside of the seepage berm, it causes no problems.

This is why the Corps builds up the sand berms to act as a counter to the force of underseepage trying to work its way to the surface. If it does make it to the surface, it will do so a longer, safer distance from the levee.



REMAPPING

- **FEMA remapping is continuing at this time**
 - **Time critical response required**
 - **Timely progress**
 - **Attainable goals/milestones**
 - **Re-designation as AR Zone**
 - **Adopt current draft maps with provision of reaccreditation of levee by specific time**



Our levee boards need us--the alliance of political subdivisions and local government entities.

RRABB and the 19th need our support, politically and perhaps also to gain the following:

- **staff support**
- **engineers**
- **equipment**
- **identification, determination and appropriation of funds to the levee districts from several known and available sources**
- **and, perhaps as a last resort, some directly advanced finances.**

RRABB and the 19th need us to aid in the identification of funds, pressure to receive those funds, formulation of solid plans to move our area into a bona fide plan of remedial action, and general support of the remedial effort.



Conclusions:

The Administration is requesting of the Alexandria City Council formation of a capital project known as the “Recertification of Rapides Area Levees Alliance” (“RRALA”) Project, from which \$100,000 should be immediately allocated to the RRALA project with an additional \$350,000 to be advanced upon certification of a bona fide plan gaining preliminary approval from the United States Army Corps of Engineers for re-certification of the affected levees, to confect any such agreements with the Corps and/or to confect any necessary agreements with the Federal Emergency Management Agency (FEMA); and

The City of Alexandria cannot protect its citizenry without providing immediate, emergency aid to adjoining and proximate localities and political subdivisions of the State of Louisiana—including but not limited to the Rapides Parish Police Jury, the City of Pineville, the Town of Boyce, the Avoyelles Parish Police Jury, the Grant Parish Police Jury, the Natchitoches Parish Police Jury, any villages, towns, and cities located within those jurisdictions, and other political subdivisions, agencies and instrumentalities of the state of Louisiana—such as the Red River, Atchafalaya and Bayou Boeuf Levee District, the Nineteenth Levee District, the Red River Waterway Commission, and any other jurisdictional or stake-holding public or private entities affected by de-accreditation that could affect Alexandria or engaged in flood protection and fighting efforts that could affect Alexandria.

