

CITY OF CLEVELAND, MISSISSIPPI

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John Lindsey
Brett Moorman
Greg Korb
Ray Bell
Bill Quinton
Tommy Naron
Bobby Love
Donnell McNeer
Herman Cox, Jr.
Mike Belenchia
Jerry Metcalf
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FLOODPLAIN MANAGEMENT PLAN

2009 Update

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INTRODUCTION

Flood Hazard Mitigation is defined as, “all actions that can be taken to reduce property damage and the threat of life and public health from flooding”. While flooding cannot always be stopped, flood hazards can be reduced.

The City of Cleveland has been a participant of the National Flood Insurance Program (NFIP) since 1978 and in the Community Rating System (CRS) since 1992. As a part of those participations, city personnel are constantly engaged in efforts to prevent flooding and minimize hazards that may threaten life and property.

In May of 1997 a Floodplain Management Committee was appointed by the Mayor and Board of Aldermen and given the immediate task of researching the flood hazard within The City of Cleveland and developing a Floodplain Management Plan. A committee was established that consisted of the Mayor, City Administrator, different City Department Heads, the Bolivar County EOC Director, and private citizens. The committee included residents in the mapped floodplain area and others from around the city.

This update of the Floodplain Management Plan will include the same principles and techniques established by the original plan committee. The objective of this plan is to produce a program of activities that will best mitigate Cleveland’s flood problem and meet other community needs. This plan update will strive to meet the following objectives:

- Ensure that all possible activities are reviewed and implemented so that the most appropriate and efficient solutions are used to address the local flood problem.
- Link floodplain management policies to specific activities.
- Ensure that activities are coordinated with each other and with other community goals, objectives and activities, preventing conflicts and reducing the cost of implementing individual activities.
- Educate residents about the flood hazard, flood loss reduction measures, and the natural and beneficial functions of floodplain areas.
- Build public and political support for projects that prevent new flood problems, reduce flood losses and protect the natural and beneficial functions of floodplain areas.
- Fulfill planning requirements for state or federal assistance programs.
- Facilitate implementation of floodplain management activities through an action plan that has specific tasks, staff assignments and deadlines.

COMMUNITY BACKGROUND

The City of Cleveland, Mississippi was incorporated in 1886. Prior to this, the community was known as Simms. Cleveland was established as a division point for the railroad as it progressed northward from Vicksburg to Memphis. In the years that followed, Cleveland became quite a railroad town with considerable numbers of railroad employees living in Cleveland.

In 1901 Cleveland was established as the county seat for the Second Judicial District with Rosedale remaining as the county seat for the First Judicial District. Cleveland is governed by seven aldermen and a mayor. The City is divided into six wards with one alderman being elected from each. One alderman and the mayor are elected at-large by the entire city.

Cleveland is located in the Mississippi River Delta in eastern Bolivar County at the intersection of U. S. Highway 61 and Mississippi State Highway 8. The Mississippi River Delta is typically low, flat, swampy land, dotted with lakes, streams, rivers, and bayous, but is some of the most fertile and productive farmland in the United States.

Cleveland has grown to be the agricultural, manufacturing, commercial and educational center of Bolivar County. The 2000 U. S. Census records indicate Cleveland with a population of 13,841 persons. Cleveland is a vibrant town that has been recognized as “one of the 100 best small communities” and is also known as the “Crossroads of Culture in the Delta”.

Cleveland is home to Delta State University, and bears a lively and youthful “college town” atmosphere for more than 4,000 students.

THE FLOODPLAIN MANAGEMENT COMMITTEE

At the June 4, 2009 Board Meeting, the Mayor and Board of Aldermen ordered a resolution be passed that a new Floodplain Management Committee be appointed with the task of preparing the Floodplain Management Plan update and that the plan be prepared in draft form for consideration by the Mayor and Board at its meeting on September 1, 2009. The Mayor and Board appointed the following Floodplain Management Committee members:

Billy Nowell, Mayor – Chairman	Tommy Naron
John Lindsey, City Administrator	J. C. Scott
Brett Moorman, Floodplain Administrator	Donnell McNeer
Greg Korb, City Engineer	Herman Cox, Jr.
Ray Bell, Public Works Director	Bobby Love
Bill Quinton, Bolivar County EOC Director	Mike Belenchia
	Jerry Metcalf

June 25, 2009: The Floodplain Management Committee began meeting to assess the flood hazards and flood problems facing Cleveland. Floodplain Administrator Brett Moorman presented members with a copy of the FIRM and Repetitive Loss Areas for Cleveland. Committee members reviewed flooding hazards and problems as listed in the 1997 plan and updated them with current issues.

July 9, 2009: The second meeting of the Floodplain Management Committee was geared toward reviewing and updating the goals and objectives listed in the 1997 plan. As conditions have changed somewhat, committee members added to the original list. Members were given an update of the Flood Hazard Questionnaire that was mailed to all property owners in the mapped floodplain areas. Members agreed to include the comments from the questionnaire in the update of the goals and objectives.

July 30, 2009: The purpose of this meeting was to review the draft section of goals and objectives developed in the July 9, 2009 meeting and to discuss the next section by reviewing possible floodplain management activities. Members agreed on items to be included in this section and directed Brett Moorman and Greg Korb to develop the final action plan to complete the draft update.

August 10, 2009: The purpose of this meeting was to submit the draft plan including the action plan as recommended by the Committee. Members made revisions as necessary to the draft plan update and agreed upon August 24, 2009 at the date for a hearing inviting the public for comments on the plan update.

August 24, 2009: This meeting was considered a public hearing and held at City Hall at 6:00 p.m. to obtain comments from the public on the plan update. No additional comments were received and the draft plan is scheduled to be presented to the Mayor and Board of Aldermen for adoption on September 1, 2009.

ASSESSING THE HAZARDS



The most notable flood events for The City of Cleveland since 1958 are listed as follows:

1. 1958 – Initial surcharging of Bogue Phalia, Lead Bayou and Jones Bayou drainage systems followed by diversion of the Sunflower River through Cleveland via the “Merigold Cutoff”.
2. 1962 – Similar to the 1958 event.
3. 1973 – Severe state-wide flooding, Cleveland hit to lesser extent than other delta cities but considerable damage occurred throughout January through May period. Street damage was estimated at \$114,000.
4. 1979 – State-wide flooding.
5. 1981 – Primarily during a November to December time frame; periodic heavy rainfall creating Sunflower tributary backwater effects.
6. 1982 – Similar to the 1981 event.
7. 1983 – Similar to 1981 and 1982 but to a lesser extent.
8. 1989 – July 1, following an overnight rain event of 6 to 7 inches. Street and home flooding occurred extensively before officials estimated that it would. It would be two years later before the City Engineer verified what was already suspected of increasing the hydraulic loading to the Jones Bayou system.

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9. 1991 – Period of February through May. On top of already saturated ground, the City received 13.75 inches of rainfall (sometimes at a rate of 2 inches per hour) within a 30 hour period. On the night of February 27, 1991, the city suffered property damage similar to the 1958 and 1962 events and this flooding remained for quite some time. It was almost immediately determined that the cause of rapid overflow of the Jones system then and in 1989 was an unauthorized diversion of a vast amount of acreage normally drained by the Bear Pen system. The City then rebuilt the natural ridge and limited home flooding from the first weekend of March through the remainder of the disaster period although heavy rains continued. Building flooding during this event prompted a homeowner survey for damage estimates. The survey revealed that 28 homes that experienced flood waters. Losses to homeowners alone exceeded \$200,000. North First and Second Avenues and the underground utilities had to be later rebuilt.

10. 2001 – During a late November and early December storm front, the city received large amounts of torrential rainfall ultimately causing a disaster declaration for the area. Large amounts of rain on an already saturated ground caused flash flooding and public infrastructure damage. The damage was primarily to city streets and some culvert crossings. The damage estimates were around \$75,000.

The main drainage systems affecting Cleveland are the Jones Bayou drainage system, the Pecan Bayou drainage system, the Lead Bayou drainage system and the Bear Pen Canal drainage system. The majority of populated residential area is concentrated around the Jones Bayou drainage system, and contains the largest area of mapped floodplain residents in Cleveland.



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Most direct causes of flooding are attributed to flash flooding on city streets and around storm drains due to the flat topography of the area. Flooding can cover many blocks at times over one foot in depth. The most common flood damage reported has been to parked vehicles in city streets; minor residential damage such as flooring, baseboards, sheetrock; minor commercial damage to floors, baseboards and sheetrock. During torrential rainstorms, flash flooding can occur with little or no warning.



Bogue Phalia backwaters affect West Bogue Hasty, then East Bogue Hasty in the county and quickly back up Bear Pen Canal and Pecan Bayou. Few homes in this area have repetitive inundation from backwaters.

The Jones Bayou system impacts a large area of central Cleveland. The majority of all flood losses are a result of backwaters due to high levels on the Sunflower River.

The eastern portions of the City of Cleveland are directly affected by drainage of the Lead Bayou system via West Main Canal to the northeast and key canals in the east-central and southern portions of the City. This area is not highly affected by backwater unless elevations on the Sunflower River are high. Lead Bayou is well designed to move floodwaters from its tributaries. It should be noted that this zone does encompass a large area of residentially developed “AE” floodplain.

The effects of a non-maintained “Merigold Cutoff” on the City of Cleveland could simply mean heavy hydraulic loads from the lower Merigold area that we are unaccustomed to handling. This situation has recently been intensified by that Jurisdiction’s unauthorized cleaning of a section between Highway 61 and McWeemus Road not to mention the removal of a “weir” that was a portion of the old C & G rail bed. The “Cutoff” was originally an approved

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shortcut to the Sunflower River and was constructed in the 1940's. Only the most severe conditions such as was apparent over 30 years ago gave cause for mitigation.

As with the “Merigold Cutoff’s” affect on the Jones Bayou system, the natural drainage of thousands of acres below Renova at the C & G rail culvert was “plugged” in 1988 by individuals who did not wish the area to drain into the Lead Bayou system.

Although every effort is made by City officials and City personnel to alleviate flooding and to protect private property as well as public property, during periods of very heavy rainfall when Jones Bayou and the Sunflower River are filled some flooding is inevitable.



ASSESSING THE PROBLEMS

The current Flood Insurance Rate Map (FIRM) is dated July 17, 1989 and does not reflect current situations in some areas. A map modernization initiative is currently underway with hopes of receiving new maps in the near future.

All of Cleveland is located in either the 500-year floodplain (X Zone), or the 100-year floodplain (AE Zone). Local floodplain officials regulate the 100-year floodplain (AE Zone). This zone indicates areas that have a 1% chance of flooding in any given year.

The 100-year floodplain in Cleveland has a mixture of property types and is scattered throughout the city. Even though most floodplain properties have structures that are not located within the mapped floodplain, the following list is a current representation of property uses in the mapped floodplain areas:

Use of Property	Qty.	Use of Property	Qty.
Single-family Residential	222	Golf Course	2
Two-family Residential	2	Baseball Field	1
Multi-family Residential-# of bldgs.	3	Civic Buildings	6
Multi-family Residential-# of units	36	Cemeteries	1
Commercial – Private Business	32	Vacant – Private	65
City Government Services	2	Vacant – Public	30
County Government Services	4	School – Delta State University	2
Emergency Services	1	School – Public School	3
Public Utility	2	School – Support Service	1
Public Park	1	Religious	5

Fortunately, there are no critical facilities located in any of the flood prone areas, however, when streets are flooded emergency vehicles such as ambulances and fire trucks can be deterred from normal routes and/or slowed in their response time.

The City of Cleveland continues to grow and City personnel are very much aware of potential problems. One area of concern is development at Delta State University. Construction of buildings, renovations and addition to existing buildings, and addition of concrete parking areas all play a large part in compounding the flooding problems for this area. These have caused serious interruption of drainage on Delta State property and also on surrounding City property. A large storm water project has been in the planning stages for some time at Delta State; however funding issues have continued to delay this project.

Residential construction over the past years has remained steady but is now beginning to slow down slightly due to available developments. The City has stringent regulations for subdivision development which includes drainage requirements. Plans are checked by the City Engineer and Building Officials prior to approval.

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There has been considerable growth in the past five years along Highway 61, especially on the north end. Of course, plans are carefully checked for any possible drainage problems. Retention ponds were a part of the Wal-Mart and Wendy's construction.

Growth within the mapped floodplain areas has slowed significantly. The Building Department still requires elevation certificates for any construction within the floodplain. An elevation certificate is required prior to construction for permitting and another is required after the floors are constructed. Building Department staff continues to check elevation certificates to ensure that the lowest floor elevation is above the Base Flood Elevation (BFE).

The longest portion of mapped floodplain in Cleveland is along Jones Bayou running north and south through the city. Most common flooding problems occur during short periods of very heavy rainfall. Figure 1 illustrates the mapped floodplain areas.

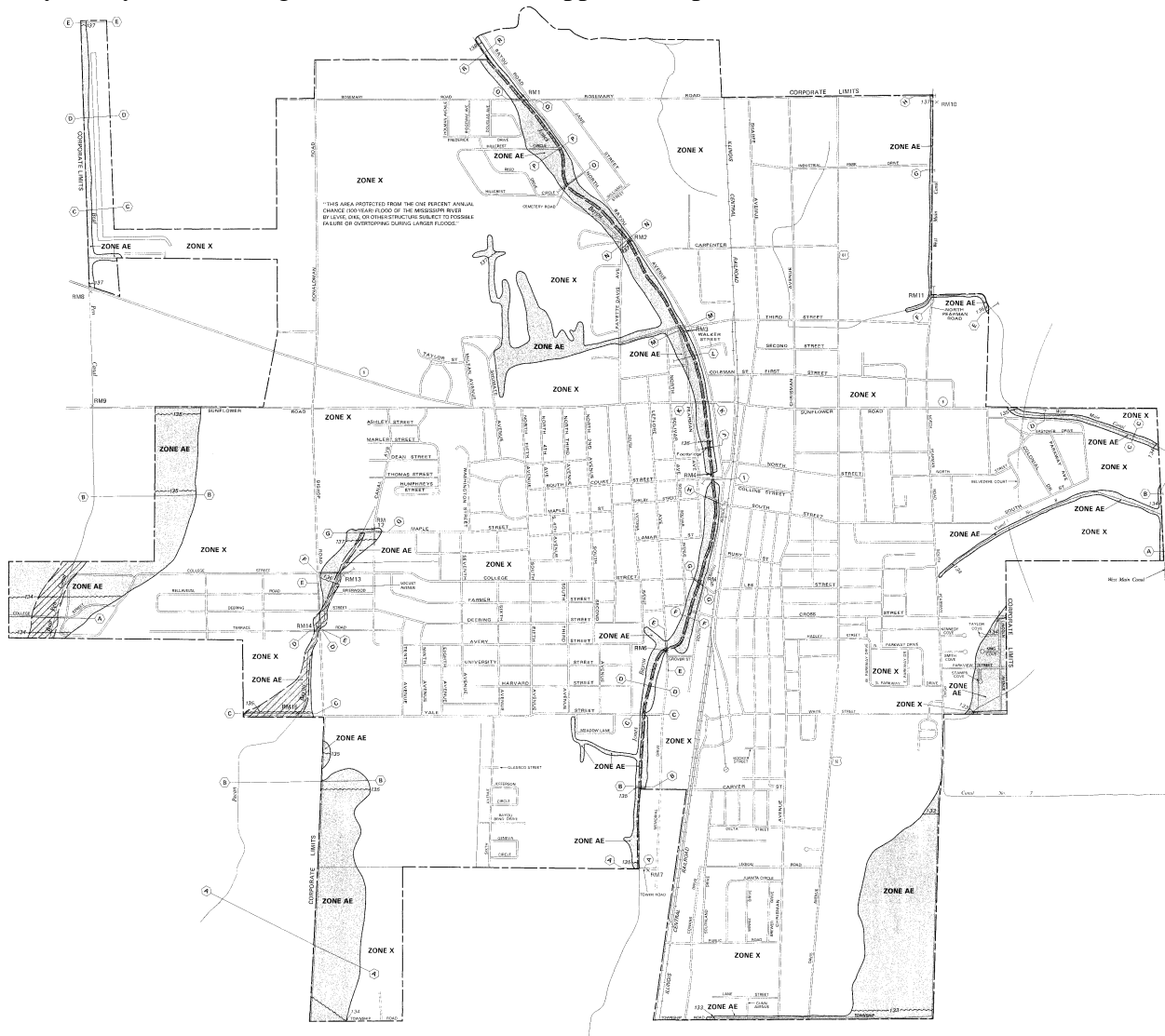


Figure 1

Repetitive Loss Areas

In the United States there are over 115,000 repetitive loss properties. Although some of these properties have had mitigation measures applied to them, most remain at risk of flooding. As stated in the CRS Coordinators Manual, “Repetitive loss properties are those properties for which two or more flood claims of more than \$1,000 have been paid by the NFIP within any 10-year period since 1978. Repetitive loss properties represent only 1% of all NFIP’s insurance policies nationwide, but they have accounted for nearly one-third of the claim payments”.

Each year, FEMA produces a list of repetitive loss properties for communities in or interested in the CRS program. Even though there are only six repetitive loss properties in Cleveland, officials have designated seven repetitive loss areas as areas that pose the greatest risk for potential repetitive losses.



Repetitive Loss Area 2

This area contains 4 single-family homes. Flooding at this location usually takes place during long periods of rain when the ground is saturated and storm drain lines are at capacity. Improvement was made to the area several years ago with the upgrade of a new 72 inch storm drain culvert along South Second Avenue; however some flash flooding can still occur during extremely heavy rains. Sometimes water can accumulate to a depth of a few inches before it can be discharged. Figure 3 illustrates Repetitive Loss Area 2.



Figure 3

Repetitive Loss Area 3

Area 3 is the largest Repetitive Loss Area and contains 68 single-family homes, 5 duplexes, 6 apartment units, 18 townhouse units, 2 religious buildings, 5 educational buildings, and 5 commercial buildings. Flooding in this area primarily occurs during periods of heavy rainfall. Most of this area is developed and the existing storm drainage system cannot handle the loading during heavy rains. Water usually runs off shortly after the rain stops or slows enough for the drainage system to catch up. Some of this area drains across Highway 8 and eventually to the Fayette Davis storm water pumping station. Water in this area can sometimes reach nearly one foot especially during heavy rains at the low points on each street. Figure 4 illustrates Repetitive Loss Area 3.



Figure 4

Repetitive Loss Area 4

Area 4 contains 15 single-family homes. Flooding in this area is due to heavy rains falling faster than the Fayette Davis storm water pumping station can handle. All of this area drains into a large ditch between Johnson Drive and Robinson Drive and is funneled into the pumping station on Fayette Davis and eventually into Jones Bayou. Most storm water is handled by the main ditch and pumping station, however during extremely heavy downpours, water can back up to several inches in the street areas. The lower part of Johnson Drive seems to hold more water due to the design grades of the area and the problem of access to clean the ditch behind the houses. Figure 5 illustrates Repetitive Loss Area 4.

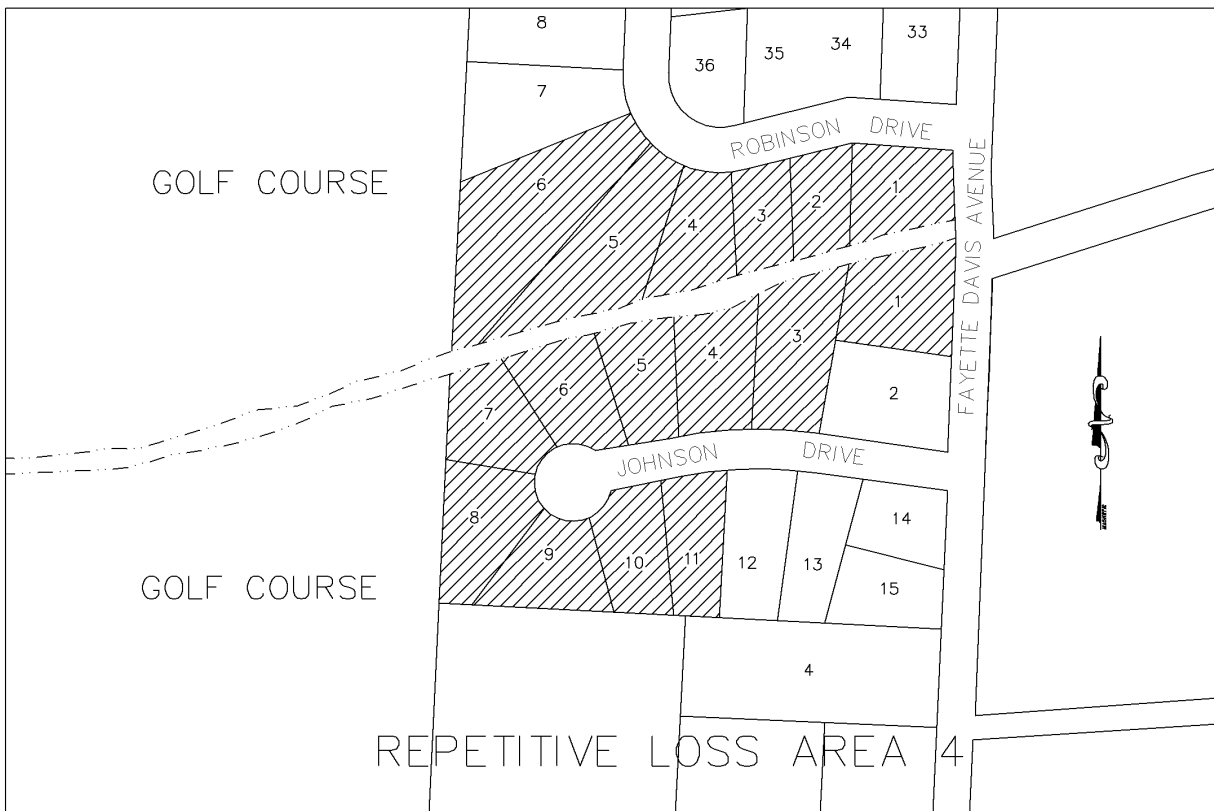


Figure 5

Repetitive Loss Area 5

This area contains 7 commercial businesses and 4 vacant lots. Flooding in this area occurs during periods of heavy rainfall and can accumulate to depths over one foot in streets. The problem is compounded by loss of business during these types of rain events because North Chrisman Avenue can become impassible by smaller vehicles and the City often has to close the road to prevent wave action damage to area businesses. This area drains south and crosses Highway 61 at a box culvert at Third Street. The City Engineer has determined that the MDOT box culvert was installed almost one foot higher than the downstream end of the pipe servicing this area. Figure 6 illustrates Repetitive Loss Area 5.



Figure 6

Repetitive Loss Area 7

Area 7 contains 14 single-family structures along Lincoln Avenue. This area experiences severe flooding problems during heavy rains. Public Works personnel assist the area by barricading the street off during these rains to prevent passing motorists from causing wave action damage to the homes. This area is located in the mapped floodplain and is subject to over one foot of water in streets and yards during these events. Figure 8 illustrates Repetitive Loss Area 7.

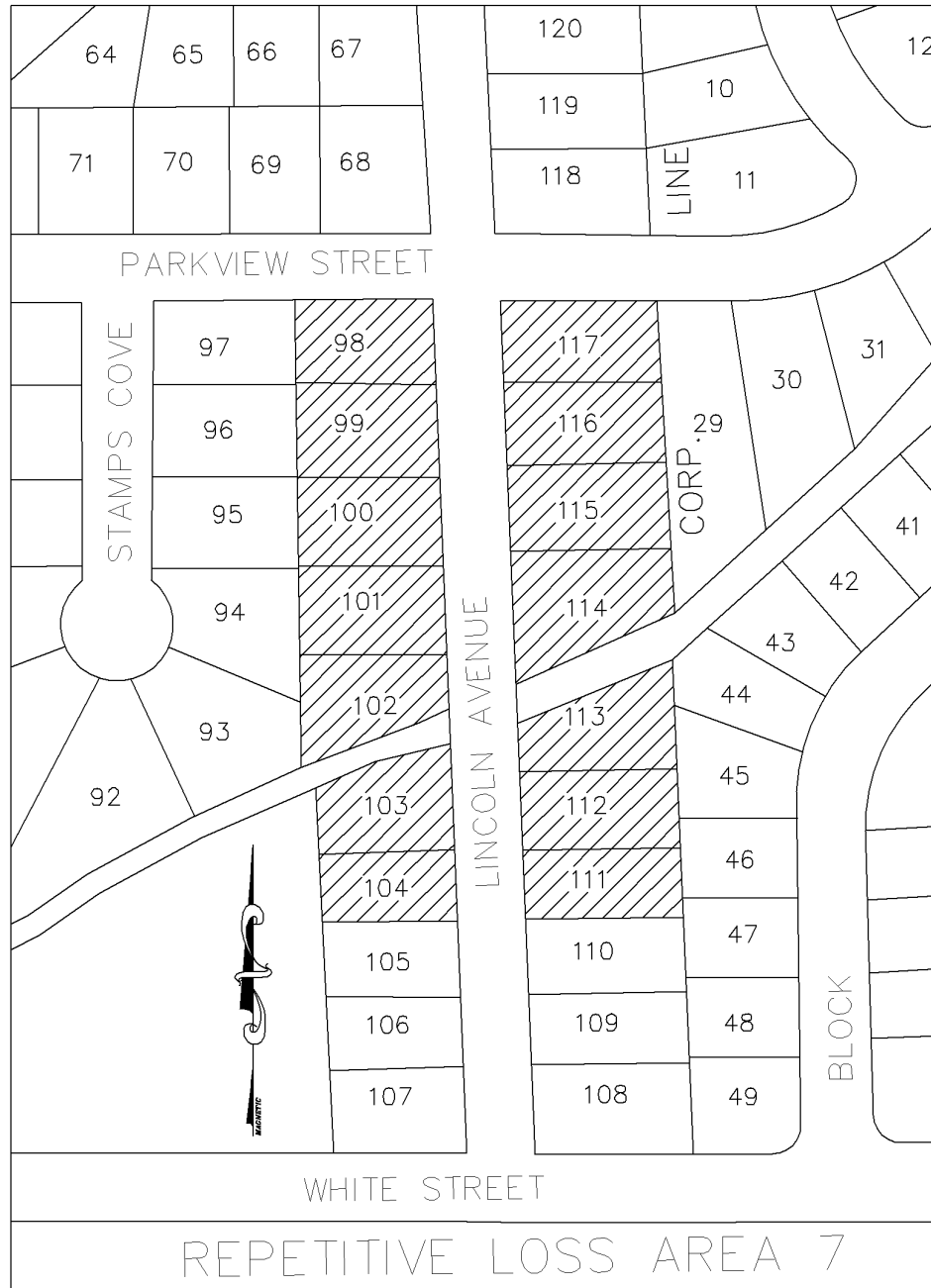


Figure 8

SETTING GOALS AND OBJECTIVES

The Floodplain Management Committee identified a set of goals and objectives for the plan update. These included a review of the 1997 plan, comment from city officials, comments from committee members, and comments from the public. The following were identified:

1. Development of detention areas for excess storm water storage during heavy rain events on the Delta State or Cleveland Country Club golf courses. This will help to alleviate flooding in Repetitive Loss Areas 3 and 4.
2. Continue Public Works activities during heavy rain events by clearing all drains, culverts, and choke points of debris to expedite the drainage process.
3. Complete the drainage system mapping for Cleveland to determine inadequate storm drain culvert sizes and elevations. This should especially apply for Repetitive Loss Areas 3, 5, and 6.
4. Update Subdivision Regulations to be sure that new development does not deter natural drainage, to ensure that post-development runoff does not exceed pre-development runoff, and to set a minimum floor elevation for new construction to at least 12-inches above the crown of the street.
5. Continue to inform citizens as to their responsibilities with regard to protection of their property from flooding and avoiding actions that might cause flooding on other property.
6. Continue public information projects to educate citizens about the hazards of flooding, what they can do to prevent it, and the natural and beneficial functions of floodplains.
7. Obtain CRS Class 7 rating by January 1, 2011.
8. Encourage the enforcement of reckless driving regulations to prohibit drivers from speeding in flooded areas and causing wave action damage.
9. Upgrade storm drainage systems to alleviate or reduce flooding impacts to Repetitive Loss Area 1.
10. Upgrade storm drainage systems to alleviate or reduce flooding impacts to Repetitive Loss Area 3.
11. Develop strategy for cleaning open ditch or piping the ditch between Johnson Drive and Robinson Drive to improve drainage in Repetitive Loss Area 4.

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12. Contact MDOT about lowering box culvert at Third Street under Highway 61 and enlarging storm drain under Highway 61 at North Street.
13. Design storm drainage project to provide additional runoff storage along North Chrisman to reduce flooding problems in Repetitive Loss Area 5.
14. Upgrade drainage systems along North Street and along S. Andrews to alleviate flooding problems in Repetitive Loss Area 6.
15. Obtain funding for new storm water pumping station on S. Pearman Road east of Amzie Moore Park to alleviate flooding problems in Repetitive Loss Area 7.
16. Determine best project for improving drainage along alley between N. Chrisman and Highway 61 next to the Delta Cream Donut shop.
17. Continue to slope and grade portions of open ditches annually.
18. Work with the Jones Bayou Drainage Commission and the Town of Boyle to clean and grade Jones Bayou from Laughlin Road to Highway 446.
19. Continue to encourage large developments to provide detention areas to slow storm water runoff.
20. Continue to enforce the stream dumping ordinance that prohibits individuals from placing grass clippings, leaves, debris, etc., into street gutters, storm drains, or open ditches.

REVIEWING POSSIBLE ACTIVITIES

The Floodplain Management Committee reviewed present activities and considered other activities that might be carried out to mitigate flooding issues. The following were considered:

Preventative Activities

1. The Building Department presently requires elevation certificates for any new construction or addition in the 100-year floodplain (Zone AE). An elevation certificate is required prior to any permit issuance showing the proposed lowest floor elevation and another elevation certificate is required after the floor is constructed showing the actual lowest floor elevation as it was constructed. Certificates are reviewed by the Building Official to ensure compliance and inspections are made to verify the lowest floor elevation. It is also the policy of the Building Department that substantial improvement is calculated on each floodplain project and that a cumulative ten year period is used for calculations.

The Committee recommends continuance of this program and would like to see the City update the Flood Prevention Ordinance to include more stringent substantial improvement requirements and to allow for freeboard on lowest floor requirements in the regulated floodplain.

2. The Committee recommends to update the Subdivision Regulations to include the following:
 - a. Require that all plats for new subdivisions and surveys indicate the location and elevation of the floodplain.
 - b. Require that post-development runoff cannot exceed pre-development runoff.
 - c. Require a minimum elevation for new construction. A minimum of 12-inches above the crown of the road is suggested.
 - d. Require that new development does not deter natural drainage and encourage large developments to provide detention areas for storm water storage.
3. The Committee recommends continuing enforcing the ordinance forbidding dumping of any trash, debris, yard clippings, etc. in any open stream, gutter, inlet or open ditch. It is also recommended that an annual letter be sent to all known commercial lawn care companies warning of the danger of grass clippings and other debris in the City's storm drainage system and the penalties for violating the ordinance.

4. One of the ongoing, effective preventive activities of the City Public Works Department is maintenance of open ditches and streams in the City of Cleveland. There is a map maintained and regular inspections are made of streams and specific known choke points. Regular check lists are turned in to the Public Works office but many additional checks are made as a part of the normal Public Works schedule. As a part of these inspections, streams and choke points are cleared, many times at the time of the inspections. If there is a large item that requires equipment and crews to clear, this is scheduled as soon as possible, certainly before more rain occurs. This is especially true during periods of heavy rainfall and immediately following. In addition to the regular checking, Public Works crews respond when citizens report blockage.

The Committee recommends continuance of this program.

5. The City continues to maintain an extensive underground drainage system that includes over 60 miles of pipes ranging in size from 12 inches to 72 inches, numerous junction boxes, and over 4,000 catch basins. These continue to be checked regularly and debris removed to allow better drainage. During times of rainfall, crews continue to work to keep drains flowing. In addition to regular maintenance, other lines are cleaned when problems are noted.

The Committee recommends continuance of this program. It is also recommended to establish a route for the City's vacuum truck to clean all lines within the City at least annually.

6. Another problem considered was size of drain lines especially in the North Chrisman and in the North Street areas. There are areas of Cleveland that have repetitively suffered flooding and the small lines are definitely a factor.

The Committee recommends completion of a drainage study to determine which pipes need to be upgraded to handle present and future storm water problems. It is also recommended to look into a "pipe bursting" technique along North Street where development would be hindered by conventional upgrading.

7. The City continues to encourage development at all levels while recognizing the need to maintain as much open space as possible especially in areas subject to flooding or along the floodway.

The Committee recommends for the City to continue providing open space to reduce flood damage problems.

8. The City continues to adopt and enforce the latest edition of the International Building Code series. At present the City has adopted and enforces the 2006 edition and is currently in the process of preparing the ordinances to adopt the 2009 edition. These codes have flood specific regulations in them.

The Committee recommends continuing updating the codes as they become available.

Property Protection Activities

1. The City has been actively involved in the National Flood Insurance Program since 1978 and has been a part of the Community Rating System since 1992. The City presently has a Class 8 rating as a result of CRS activities which has resulted in a 10% reduction in flood insurance rates in the City. The work of the Floodplain Management Committee is just one of various activities being conducted in an attempt to raise the Class and, therefore, get further rate reductions. Through various outreach and public information projects every effort is made to make the citizens aware of the availability and desirability of flood insurance protection.

These efforts are recommended to continue.

2. Public Works personnel are available to provide personal information and recommendations for flood control and property protection upon request. Often this service is provided when problems are discovered during times of heavy rainfall; many times City personnel will contact home owners to offer suggestions. Often citizens will call to ask for information when they are considering building on a particular parcel. City personnel visit the area, talk with residents/home owners, and offer counsel based on experience and observation.

It is recommended that this service be continued and, in fact, be made more of a priority in so far as offering suggestions when a problem is noted.

3. The Building Department continues to encourage citizens to purchase flood insurance. Each time someone requests a map determination letter from the city a separate handout is included on the mandatory purchase requirement if that property lies within a special flood hazard area. Each year the Building Department issues a press release discussing the importance of flood insurance and how property owners can purchase the insurance whether they are in a mapped floodplain or not. The Floodplain Administrator also speaks to civic clubs about the importance of flood insurance.

The Committee recommends continuing this program.

4. The City has completed one FEMA relocation project at 305 Roby Street during 2001. This structure was listed as a repetitive loss structure and suffered flood damage numerous times over the years. The City has a total of six repetitive loss properties and continues to advise property owners on possible relocation, acquisition, demolition, or retrofitting projects. The Committee recognizes the fact that Cleveland actually has very few qualified structures for these programs but recommends continuing to look for ways to eliminate flood prone properties.

Natural Resource Protection Activities

1. The Floodplain Management Committee continues to recognize the important and beneficial functions of the floodplain and seeks to preserve the natural characteristics of floodplain areas whenever possible. There is a need in the city as well as in rural areas for water to be allowed to flow naturally and to preserve the natural landforms. Citizens are made aware of these functions in a section of the outreach projects delivered annually. City Officials should not allow any activities that would change or alter these naturally occurring functions. In addition to the obvious channel for water, these areas also serve as habitat for wildlife, a benefit also noted by the Committee.

It was recommended by the Committee to continue informing citizens of the beneficial functions of floodplains and to encourage natural development in these areas; however concern was expressed in allowing low-lying areas such as wetlands due to increased mosquito populations and potential disease problems.

2. The City continues to experience problems with erosion and sediment control along open ditches. As part of their routine inspections, the Public Works Department notes areas that are having problems with erosion or sediment and schedules work to be done to eliminate these. In the case of erosion, the affected area is regraded and bank stabilization is done. Sediment is removed from open ditches on a regular basis to avoid further drainage problems.

The Committee recommends to continue the routine inspections and repair work on open ditches. It is also recommended to include an amendment to the Subdivision Regulations requiring developers to address erosion and sediment control during construction.

Emergency Services Activities

1. Personal safety and property protection continue to be a source of great concern for Floodplain Management Committee members. The Committee recognizes that due to the type of flooding experienced in Cleveland, it would be difficult to give advance warning to citizens for normal conditions. When citizens experience water damage in their homes it is almost always a result of very heavy rainfall over a short time frame or a result of channels that are full and backing up. Public Works personnel are usually able to determine potential problems based on water levels at various points, however this information is only accurate enough to personally warn some individuals that regularly experience flooding problems in these areas. The most appropriate emergency service that the City can perform is to keep water moving in order to alleviate shallow flooding problems until the danger passes. The Public Works Department is part of the Bolivar County Emergency Management Plan and continues to work with other agencies as needed to provide assistance where possible. After review, the Committee could not recommend further actions to be taken.

Structural Project Activities

1. The City of Cleveland continues to pursue the prospect of developing large holding areas for storm water runoff within Cleveland. The Committee recognizes the benefit for establishing detention areas along main drainage systems to allow time for storm water to properly run off without creating flooding issues. The Committee recommends that city officials study the following sites to determine if detention projects are feasible:
 - a. An area on the east side of the pro shop on the Delta State University golf course. Committee members reported that a plan was created some years ago to develop a large detention area on the DSU golf course to slow down storm water runoff to the Fayette Davis pumping station.
 - b. An area between Merritt Drive and Hillcrest Circle. The Cleveland School District presently owns approximately 10 acres of undeveloped land immediately adjacent to Jones Bayou and north of Pearman Elementary School. The Committee recommends that city officials contact the school district for the possibility of this project.
 - c. An area along Jones Bayou north of Rosemary Road. The City presently owns approximately 2.5 acres between Jones Bayou and North Bayou Road north of the cemetery water well.
 - d. An area along Pecan Bayou south of Terrace Road. The Committee recommends that city officials determine if this project would help to alleviate Pecan Bayou flooding problems and if so, to see about acquiring sufficient space for this. The property is currently agricultural land owned by the Aguzzi family.
 - e. An area along Jones Bayou south of the Cleveland Recreational Association. The Committee recommends that city officials determine if this project would help to provide storm water storage space for the lower Jones Bayou area and if so, to see about acquiring sufficient space for this. The property is vacant land owned by the CRA.
 - f. An area behind the Cleveland Medical Clinic east of Martin Luther King Drive. The City presently owns approximately 8 acres on the east side of the State rock gabion ditch leading to the Hospital pumping station.
2. The City allocates money each fiscal year for contract drainage work. A determination is made early in each budget year for the areas that would benefit the most from the work and contractors are hired to clean these ditches and return them to the design grades. The City has participated in cleaning out most of Jones Bayou with the Jones Bayou Drainage Commission. Even though most of this area is outside of the city limits of Cleveland, it is most assuredly a benefit to Cleveland

citizens. This work enables water to drain properly and helps to prevent flooding issues along Jones Bayou. The only area not cleaned has been from Laughlin Road to Highway 446. This area has not been accessible for equipment and local homeowners do not want the City to disturb their section.

The Committee recommends to continue the ditch maintenance program and to work with the Jones Bayou Drainage Commission and the Town of Boyle to get the area between Laughlin Road and Highway 446 cleaned and graded.

3. It is noted that an area of concern for flooding problems is along North Chrisman Avenue between Carpenter Street and Industrial Parkway. During very heavy rains the road has to be closed in this area due to standing water and this causes a disruption to local businesses. Also, the MDOT box culvert under Highway 61 at North Street was installed approximately 12 inches higher than the downstream end of the culvert draining this area.

The Committee recommends upgrading or installing new storm drainage along North Chrisman from Industrial Parkway to Third Street, to encourage property owners to provide detention or storage areas for storm water, and to contact MDOT to request that the box culvert under Highway 61 be lowered to accommodate Cleveland's drainage system.

4. It is noted that Committee members expressed concern about improper storm drainage along North Street, the Donut Shop Alley and along South Andrews. This area suffers significant flooding problems on a regular basis. Often streets must be closed to prevent further damage and business owners must endure loss of business when affected by the regular flooding.

The Committee recommends upgrading the storm drainage in this area to meet current and future drainage needs. It is also recommended to contact MDOT about increasing their culvert size under Highway 61 at North Street.

5. Committee members recommended seeking funds to install a new storm water pumping station on the east side of South Pearman Road east of Amzie Moore Park to alleviate flooding issues in the Lincoln Avenue area. This project may qualify for a Hazard Mitigation Grant Program through MEMA.
6. Another possible project would be to determine if a new storm water pumping station located on the south side of Yale Street at the Sixth Avenue ditch would provide flooding relief from Repetitive Loss Area 1. An upgrade of some existing storm drainage would also be necessary upstream of the pumping station.

Public Information Activities

One activity that is conducted throughout the year by city officials is to educate the public on the dangers of flooding and what they can do to prevent it. The Floodplain Management Committee reviewed the current and possible activities for this category and made the following recommendations:

1. It is recommended that the Floodplain Administrator continue to provide an annual outreach program to each citizen of Cleveland to educate them of the dangers of flooding, what they can do to prevent it, technical services offered by the city, and the natural and beneficial functions of floodplains.
2. It is recommended that the Floodplain Administrator continue to provide an annual mailing to floodplain residents. The mailing list should be updated annually and the mailing should include information specific to floodplain issues.
3. It is recommended that the Floodplain Administrator continue to provide an annual letter to all repetitive loss area property owners. This includes all owners on the FEMA Repetitive Loss List and owners located within any Repetitive Loss Area. The mailing list should be updated annually and the mailing should include information relevant to flood protection services and what options these owners have.
4. It is recommended that the Floodplain Administrator continue to provide an annual mailing to all real estate agents, insurance agents, and lenders informing them of the services provided by the City for free. This should include specific information related to their occupation.
5. It is recommended to update the information in the public library with current materials and to ensure that library staff has included them into the library database.
6. It is recommended that in addition to the outreach projects currently being done, city officials provide public service announcements with local radio, television and newspapers to further the information process. This could be done several times each year and should especially be done during Flood Awareness Month.
7. It is recommended that city officials continue to provide map information, technical assistance, and recommendations free of charge to all interested persons.

ACTION PLAN

After carefully reviewing all activities presently conducted in the City of Cleveland and those that had been suggested by the Committee, the following plan was drafted:

Continuation of Present Activities

- 1. Elevation Certificates:** The Building Department will continue to require elevation certificates on any new construction or addition located in the 100-year floodplain (AE Zone). These will be required prior to issuing a permit and another after the lowest floor has been constructed to ensure compliance with regulations. Also substantial improvement will be calculated to determine the existing structure will be required to meet base flood elevation requirements. Copies of the elevation certificates will be kept on file in paper and electronic form at the Building Department and available for review by the public.

Personnel: City of Cleveland Building Department Staff

Budget: No additional funds are necessary to continue this activity.

- 2. Stream Dumping Ordinance:** The Building Department will continue to enforce the local Stream Dumping Ordinance that prohibits individuals from depositing trash, debris, yard clippings, etc. into any open stream, gutter, inlet or other drainage structure. A letter will be sent to all commercial lawn care companies warning of the dangers associated with these actions and describing the penalties for violating the ordinance.

Personnel: City of Cleveland Code Enforcement Staff

Budget: No additional funds are necessary to continue this activity.

- 3. Ditch Inspections:** The Public Works Department will continue to perform routine ditch and choke point inspections bi-monthly and after each significant rain event. Maps will continue to be maintained to assist in this process. The inspector will continue to report any blockages, debris, or other problems and schedule work to be done to eliminate the problem as soon as possible. The Public Works Department will continue to respond to citizen complaints of blockages as well.

Personnel: City of Cleveland Public Works Staff

Budget: No additional funds are necessary to continue this activity.

- 4. Drainage System Maintenance:** The Public Works Department will continue routine cleaning of all City storm drains, catch basins, and piping. The goal will be to thoroughly clean all City underground drainage systems at least annually to increase drainage capabilities. The Public Works Department will continue to utilize the vacuum truck for this task along with other crews as necessary.

Personnel: City of Cleveland Public Works Staff

Budget: No additional funds are necessary to continue this activity.

- 5. Open Space Preservation:** The City of Cleveland will continue to maintain as much open space as possible in the floodplain areas. All levels of development will continue to be encouraged while seeking to advise developers on the need for open space in or near floodplain areas.

Personnel: All City of Cleveland Departments

Budget: No additional funds are necessary to continue this activity.

- 6. Technical Assistance:** The Public Works, Engineering, and Building Departments will continue to provide technical assistance to citizens upon request to advise them of potential flooding solutions. Personnel will continue to make site visits as requested and offer whatever assistance possible in alleviating flooding issues. This service will continue to be included in outreach projects.

Personnel: Public Works, Engineering, and Building Department Staff

Budget: No additional funds are necessary to continue this activity.

- 7. Flood Insurance:** The Building Department will continue to promote the benefits of flood insurance. Personnel will also continue to provide map determination information to the public, to lenders, real estate agents, and insurance agents as requested and mandatory purchase requirements will be included whenever a property is found to be in the special flood hazard area. Staff will continue to speak to civic clubs about the importance of flood insurance and to inform them that anyone can purchase flood insurance. This service will continue to be included in outreach projects.

Personnel: City of Cleveland Building Department Staff

Budget: No additional funds are necessary to continue this activity.

8. **Repetitive Loss Areas:** The City of Cleveland will continue the program of eliminating repetitive loss properties. The City recognizes the fact that Cleveland actually has very few qualified structures for a FEMA buyout program, but will continue to promote this as a means to eliminate repetitive flooding issues, and will continue to look for ways to eliminate flood prone properties.

Personnel: City of Cleveland Building Department Staff

Budget: No additional funds are necessary to continue this activity.

9. **Natural and Beneficial Functions:** The City of Cleveland will continue to promote the natural and beneficial functions of floodplain areas and to encourage natural development in these areas. This service will continue to be included in outreach projects.

Personnel: City of Cleveland Building Department Staff

Budget: No additional funds are necessary to continue this activity.

10. **Ditch Maintenance:** The Public Works Department will continue to plan ongoing ditch cleaning and grading projects. Personnel will continue to determine which area would benefit the most from routine work and to carry out such work annually. The Public Works Department will continue to work closely with various Drainage Commissions on joint projects that would benefit the City.

Personnel: City of Cleveland Public Works Staff

Budget: Annual budgeting of \$20,000 for contract drainage work.

11. **Outreach Projects:** The Building Department will continue to provide annual outreach projects to the community, the floodplain residents, repetitive loss residents, and to lenders, real estate agents, and insurance agents. These outreach projects will continue to describe what services are available to citizens and to inform them on important flood related issues. Mailing lists will continue to be updated annually for this program.

Personnel: City of Cleveland Building Department Staff

Budget: Annual budget of \$4,000 for postage.

12. **Public Library:** The Building Department will continue to update materials in the public library related to flooding issues. Personnel will also annually update the materials and the computer listing for library patrons.

Personnel: City of Cleveland Building Department Staff

Budget: No additional funds are necessary to continue this activity.

2009/2010 Fiscal Year

1. **Flood Prevention Ordinance:** The Building Department and the City Attorney will prepare an updated Flood Prevention Ordinance that will include more stringent substantial improvement regulations and allow for freeboard elevations. This new ordinance should be ready for the Mayor and Board of Aldermen to adopt no later than January 1, 2010.

Personnel: City of Cleveland Building Department and City Attorney

Budget: No additional funds are necessary to complete this activity.

2. **Subdivision Regulations:** The Building Department and Engineering Department along with Slaughter and Associates will update the City of Cleveland Subdivision Regulations to include the following:

- Requirement that all plats for new subdivisions and surveys indicate the location and elevation of any floodplain area.
- Requirement that post-development runoff cannot exceed pre-development runoff.
- Requirement that all new construction must meet a minimum of 12-inches above the crown of the road for lowest floor elevations in any area.
- Requirement that new development does not deter natural drainage and encourage on-site storm water storage for large developments.
- Requirement that new developments will provide sediment and erosion control.

This amendment to the Subdivision Regulations should be ready for the Mayor and Board of Aldermen to adopt no later than March 1, 2010.

Personnel: Slaughter and Associates

Budget: No additional funds are necessary to complete this activity.

3. **Storm Drain Route:** The Public Works Department will prepare a route map for the vacuum truck crew to ensure that all drainage structures are cleaned at least annually. This route map should be developed and in operation no later than October 1, 2009.

Personnel: City of Cleveland Public Works Department

Budget: No additional funds are necessary to complete this activity.

4. **Drainage Studies:** The Engineering Department will prepare a drainage study for each repetitive loss area to determine if existing drainage structures are incorrect or improperly sized. The studies will include data sufficient to determine the cause of flooding and personnel will make further recommendations for flooding solutions. The drainage studies should be completed by March 1, 2010.

Personnel: City of Cleveland Engineering Department

Budget: No additional funds are necessary to complete this activity.

5. **Building Codes:** The Building Department will prepare ordinances necessary to adopt the 2009 edition of the International Code Series that contains flood specific requirements. These ordinances should be ready for adoption by the Mayor and Board of Aldermen by January 1, 2010.

Personnel: City of Cleveland Building Department

Budget: No additional funds are necessary to complete this activity.

6. **CRS Classification:** The Building Department in coordination with the Public Works and Engineering Departments will complete enough CRS credits to achieve a Class 7 rating. A re-rating will be requested from ISO by September 30, 2010.

Personnel: City of Cleveland Building Department

Budget: No additional funds are necessary to complete this activity.

7. **N. Chrisman Avenue Drainage:** The Engineering Department will design and contract the installation of additional storm drainage along N. Chrisman from Third Street to Industrial Parkway to alleviate frequent flooding issues in this area. The project should be completed by September 30, 2010.

Personnel: City of Cleveland Engineering Department

Budget: Funds of \$95,000 will be required to complete this activity.

8. **MDOT Drainage:** The Engineering Department will contact MDOT regarding the elevation of their box culvert under Highway 61 at Third Street and regarding the size of their culvert under Highway 61 at North Street. Personnel will seek assistance from MDOT in completing these requests to facilitate drainage in these areas. Initial contact with MDOT should be made by November 1, 2009.

Personnel: City of Cleveland Engineering Department

Budget: No additional funds are necessary to complete this activity.

9. **Andrews Avenue Drainage:** The Engineering Department will design and contract the installation of improved storm drainage for Andrews Avenue between Highway 8 East and South Street to assist with flooding issues in this area. This project should be completed by September 30, 2010.

Personnel: City of Cleveland Engineering Department

Budget: Funds of \$75,000 will be required to complete this activity.

10. **Amzie Moore Park Drainage:** The Engineering Department will design and contract the installation of improved storm drainage for the Amzie Moore Park walking trail area to assist with flooding issues. This project should be completed by September 30, 2010.

Personnel: City of Cleveland Engineering Department

Budget: Funds of \$20,000 will be required to complete this activity.

11. **Bear Pen Park Drainage:** The Engineering Department will design and contract the installation of improved storm drainage for the Bear Pen Park walking trail area to assist with flooding issues. This project should be completed by September 30, 2010.

Personnel: City of Cleveland Engineering Department

Budget: Funds of \$35,000 will be required to complete this activity.

12. **Pecan Bayou Crossing:** The Engineering Department will design and contract a project to remove the existing culvert under Maple Street on Pecan Bayou and replace with the appropriate size and new designed grades. This project is the result of a drainage study performed during Delta State University planning that indicates improper piping at the Hill Apartments, Maple Street, and Yale Street crossings. Delta State is planning on replacing the Hill Apartment crossing in the first phase of their upcoming drainage project. This project should be completed by September 30, 2010.

Personnel: City of Cleveland Engineering Department

Budget: Funds of \$60,000 will be required to complete this activity.

- 13. Deering Street Drainage:** The Public Works Department will contract the installation of a small submersible pump to be installed on the west side of 1002 Deering Street to alleviate flooding in a repetitive loss structure. This project will pump some of the runoff during heavy rains to Fifth Avenue and eventually to Jones Bayou. The plans are to install a 450 gallon per minute pump to handle the excess runoff. This project should be completed by September 30, 2010.

Personnel: City of Cleveland Public Works Department

Budget: Funds of \$25,000 will be required to complete this activity.

2010/2011 Fiscal Year

- 1. Jones Bayou Ditch Project:** The Public Works Department will partner with the Bolivar County, the Town of Boyle and the Jones Bayou Drainage District to clean and grade a portion of Jones Bayou from Laughlin Road to Highway 446. This project should be completed by September 30, 2011.

Personnel: City of Cleveland Public Works Department

Budget: Funds of \$75,000 will be required from the City to be paired with money from other entities.

- 2. Southeast Cleveland Pumping Station:** The Engineering Department will design and contract the installation of a new storm water pumping station east of Amzie Moore Park on South Pearman Road to alleviate flooding in Lincoln Avenue area. This project should be complete by September 30, 2011.

Personnel: City of Cleveland Engineering Department

Budget: Funds of \$450,000 will be required to complete this activity.

- 3. Fayette Davis Ditch Project:** The Engineering Department will design and contract the installation of a paved ditch project to extend from the rear of the Johnson and Robinson Drive lots to Fayette Davis to alleviate flooding issues in this area. This project should be complete by September 30, 2011.

Personnel: City of Cleveland Engineering Department

Budget: Funds of \$250,000 will be required to complete this activity.

2011/2012 Fiscal Year

1. **DSU Golf Course Detention Project:** The Engineering Department will design and contract the installation of a storm water detention project on the Delta State University golf course. Personnel will coordinate with DSU Staff and seek funding assistance with this project. This project should be completed by September 30, 2012.

Personnel: City of Cleveland Engineering Department

Budget: Funds of \$200,000 will be required to complete this activity.

2. **Pearman Elementary Detention Project:** The Engineering Department will study the hydraulics and feasibility of creating a storm water detention project north of Pearman Elementary School adjacent to Jones Bayou. Personnel will coordinate efforts with the Cleveland-Bolivar County School District. This study should be completed by May 1, 2012.

Personnel: City of Cleveland Engineering Department

Budget: No additional funds are required to complete this activity.

3. **Cemetery Well Detention Project:** The Engineering Department will study the hydraulics and feasibility of creating a storm water detention project north of the cemetery well adjacent to Jones Bayou. This study should be completed by May 1, 2012.

Personnel: City of Cleveland Engineering Department

Budget: No additional funds are required to complete this activity.

4. **CRA Detention Project:** The Engineering Department will study the hydraulics and feasibility of creating a storm water detention project south of the Cleveland Recreational Association adjacent to Jones Bayou. This project should be completed by May 1, 2012.

Personnel: City of Cleveland Engineering Department

Budget: No additional funds are required to complete this activity.

5. **North Street Drainage Project:** The Engineering Department will design and contract the installation of upgraded storm drainage along North Street from Commerce to Highway 61 to alleviate flooding in this area. This project should be completed by September 30, 2012.

Personnel: City of Cleveland Engineering Department

Budget: Funds of \$250,000 will be required to complete this activity.

2012/2013 Fiscal Year

1. **Martin Luther King Drive Detention Project:** The Engineering Department will design and contract the installation of a storm water detention project east of Martin Luther King Drive and south of Cleveland Medical Clinic. This project should be completed by September 30, 2013.

Personnel: City of Cleveland Engineering Department

Budget: Funds of \$200,000 will be required to complete this activity.

2. **Yale Street Pumping Station:** The Engineering Department will design and contract the installation of a new storm water pumping station on the south side of Yale Street at the South Sixth Avenue Ditch to alleviate flooding issues in the area. This project should be completed by September 30, 2013.

Personnel: City of Cleveland Engineering Department

Budget: Funds of \$450,000 will be required to complete this activity.

2013/2014 Fiscal Year

1. **Terrace Road Detention Project:** The Engineering Department will design and contract the installation of a storm water detention project south of Terrace Road adjacent to Pecan Bayou. Personnel will negotiate the purchase of lands for this project. This project should be completed by September 30, 2014.

Personnel: City of Cleveland Engineering Department

Budget: Funds of \$200,000 will be required for the completion of this project.

Implementation and Evaluation of the Plan

Following adoption of the Floodplain Management Plan update, The Floodplain Administrator will be responsible for implementation of the plan on a daily basis.

The Floodplain Management Committee will continue to meet on an annual basis. At these meetings the Floodplain Administrator will submit a report of work being implemented for their review and evaluation. At this time the plan will be revised as needed. In September of each year a report will be submitted to the Mayor and Board of Aldermen, released to the media and made available to the public.

ACTION PLAN SUMMARY

Activity	Department	Budget	Deadline
2009/2010 Fiscal Year			
Establish routine route for vacuum truck	Public Works	\$0.00	10/1/09
Contact MDOT about drainage structures	Engineering	\$0.00	11/1/2009
Update Flood Prevention Ordinance	Building	\$0.00	1/1/2010
Adopt 2009 International Codes	Building	\$0.00	1/1/2010
Update Subdivision Regulations	Slaughter	\$0.00	3/1/2010
Complete repetitive loss area drainage studies	Engineering	\$0.00	3/1/2010
Apply for CRS Class 7 rating	Building	\$0.00	9/30/2010
Upgrade N. Chrisman storm drainage	Engineering	\$95,000.00	9/30/2010
Upgrade Andrews Ave. storm drainage	Engineering	\$75,000.00	9/30/2010
Upgrade Amzie Moore Park drainage	Engineering	\$20,000.00	9/30/2010
Upgrade Bear Pen Park drainage	Engineering	\$35,000.00	9/30/2010
Replace Pecan Bayou crossing at Maple	Engineering	\$60,000.00	9/30/2010
Install Deering Street 450 gpm pump	Public Works	\$25,000.00	9/30/2010
Fiscal Year Total		\$310,000.00	
2010/2011 Fiscal Year			
Clean Jones Bayou from Laughlin to 446	Public Works	\$75,000.00	9/30/2011
Install southeast Cleveland pumping station	Engineering	\$450,000.00	9/30/2011
Pave Fayette Davis ditch from DSU to pumps	Engineering	\$250,000.00	9/30/2011
Fiscal Year Total		\$775,000.00	
2011/2012 Fiscal Year			
Study Pearman Elementary detention project	Engineering	\$0.00	5/1/2012
Study Cemetery Well detention project	Engineering	\$0.00	5/1/2012
Study CRA detention project	Engineering	\$0.00	5/1/2012
Upgrade North Street storm drainage	Engineering	\$250,000.00	9/30/2012
DSU golf course detention project	Engineering	\$200,000.00	9/30/2012
Fiscal Year Total		\$450,000.00	
2012/2013 Fiscal Year			
MLK detention project	Engineering	\$200,000.00	9/30/2013
Yale Street pumping station	Engineering	\$450,000.00	9/30/2013
Fiscal Year Total		\$650,000.00	
2013/2014 Fiscal Year			
Terrace Road detention project	Engineering	\$250,000.00	9/30/2014
Fiscal Year Total		\$250,000.00	
Total of All Projects		\$2,435,000.00	