

Draft - March 14, 2019

Berrien County, Georgia

And the Cities of Alapaha, Enigma, Nashville, and Ray City



Hazard Mitigation Plan

2019-2024

To be effective June 10, 2019 through June 10, 2024 once adopted

This Plan produced for the Berrien County Board of Commissioners
by the Southern Georgia Regional Commission
through funding provided by the Federal Emergency Management Agency
and the Georgia Emergency Management Agency

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Chapter 1: Introduction to the Planning Process

Summary of changes:

Table 1.1 provides a brief description of each section in this chapter and a summary of changes that have been made.

CHAPTER 1 Section	Updates to Section
I. Purpose, Need, Authority, and Statement of Problem	<ul style="list-style-type: none"> • Language updated to reflect that this was an update to the existing plan
II. Local Methodology, Plan Update Process, and Participants	<ul style="list-style-type: none"> • Planning Committee reviewed each section and updated as necessary
III. Plan Review, Analysis, and Revision	<ul style="list-style-type: none"> • Planning Committee reviewed each section • Updates made using national, state, and local data
IV. Organization of Plan	<ul style="list-style-type: none"> • Consistent with original plan
V. Local Hazard, Risk and Vulnerability (HRV) Summary, Local Mitigation Goals, and Objectives	<ul style="list-style-type: none"> • Updates made using national, state, and local data
VI. Multi-Jurisdictional Special Considerations	<ul style="list-style-type: none"> • No major changes from original plan
VII. Adoption, Implementation, Monitoring, and Evaluation	<ul style="list-style-type: none"> • Evaluation method revised and updated.
VIII. Community Data	<ul style="list-style-type: none"> • Updates made using most recent available national, state, and local data

Table 1.1: Overview of updates to Chapter 1: Introduction to the Planning Process

Section I. Purpose and Need, Authority and Statement of Problem

This document is the official plan update to the previous Berrien County Pre-Disaster Mitigation Plan Update, as approved by the Georgia Emergency Management Agency (GEMA) and the Federal Emergency Management Agency (FEMA), which took effect on June 10, 2014 and expires on June 10, 2019.

The purpose of this document is to provide an overview of the hazards that may impact Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City and to outline the community’s plans to mitigate the potential loss of life and damages to property and the economy that could occur with these events. Hazard Mitigation is a means to address and proactively reduce the potential damage that may be caused by natural or man-made disasters.

This Plan is a direct result of research and a planning and public involvement process undertaken by the local government officials and citizens of Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City after they formed the Berrien County Hazard Mitigation Plan Update Committee (hereafter known as the HMPUC). This Plan is the result of their

commitment to reduce the risks of natural hazards and the effects of those natural hazards to their communities. The Cities of Alapaha, Enigma, Nashville, and Ray City are the only incorporated cities located in Berrien County.

Authority for the development of this Plan was given by the Berrien County Commission as a result of their execution of the Grantee-Subgrantee Agreement for the Berrien County Hazard Mitigation Grant Program (HMGP) Planning Project; and by the Cities of Alapaha, Enigma, Nashville, and Ray City located within Berrien County, through their participation in the planning project.

In order to initiate an outreach program to neighboring communities, governments, local and regional agencies, and to agencies authorized to regulate development, business, and the public, two Public Hearing Notices were published in the legal organ of the local newspaper. In addition, e-mail lists of stakeholders were kept updated and those on them were informed of meetings through e-mails, letters, and/or telephone calls. Surrounding county EMA Directors were notified of the plan update via phone calls and invited to participate in the process. Additionally, several area county Hazard Mitigation Plans were being updated at the same time and an active meeting list was maintained for scheduling purposes.

Planning Division staff from the Southern Georgia Regional Commission, which represents eighteen counties in the region (including Berrien County), attended the Berrien County meetings. They participated in all aspects of the planning process and provided a regional perspective in the formation of the multi-jurisdictional Berrien County and Alapaha, Enigma, Nashville, and Ray City Hazard Mitigation Plan.

Through the above efforts, the multi-jurisdictional Berrien County and Alapaha, Enigma, Nashville, and Ray City Hazard Mitigation Plan was updated, including a comprehensive range of Mitigation Goals, Objectives, and Action Steps (see Chapter 4) which will assist the local governments in emphasizing a more direct approach to Hazard Mitigation. The long-term goal is to reduce potential natural disaster losses to life, property, and the economy through Hazard Mitigation efforts.

Section II. Local Methodology, Plan Update Process, and Participants

A. Overview

This Hazard Mitigation Plan Update encompasses the jurisdictions of Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City, located in Southern Georgia. Each of these jurisdictions also participated in the previous Hazard Mitigation Plan update. The Southern Georgia Regional Commission provided technical assistance. A local Hazard Mitigation Plan Update Committee (Berrien County HMPUC) was formed, and a year-long planning effort was undertaken, the final product of which was a Plan Update containing updated Mitigation Goals, Objectives, and Action Steps to reduce or eliminate the potential for loss of life and damage to property and the economy caused by natural disasters (see Chapter 4).

Potential members of the Berrien County HMPUC were contacted by telephone or by letter/e-mail concerning their participation on the Committee. Southern Georgia Regional Commission (SGRC) staff provided technical assistance to the Berrien County HMPUC. The Berrien County HMPUC was comprised of representatives from Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City and also included representatives from other groups and individuals, as shown below, who attended meetings and/or conducted research:

Jurisdiction/Organization	Title	Name
Berrien County	EMA Director	Angie Rutland
Berrien County	Deputy EMA Director	Robert Mikell
Berrien County	Zoning/Building Inspector	Dennis Adams
City of Ray City	Mayor	Brenda Exum
City of Ray City	City Clerk	Denise Ray
City of Ray City	Police Chief	Steve P. Miller
City of Nashville	Police Captain	Ronald Knowles
City of Nashville	Police Chief	Chuck Edwards
Town of Alapaha	Town Clerk	Deitra Powell
Town of Enigma	Town Clerk	Michelle Rodriguez
American Red Cross	Disaster Manager	Cheryl Edwards
American Red Cross	Disaster/Program Manager	Jack Looney

The Committee held the following meetings, the sign-in sheets of which are included in Appendix E:

- Kick-off public hearing – March 6, 2018
- First workshop – April 10, 2018
- Second workshop – May 15, 2018
- Third workshop – June 19, 2018
- Final public hearing – to be scheduled after approval has been received from GEMA/FEMA

Building upon the previous Plan, each chapter was reviewed chronologically with updated hazard, risk, and vulnerability data, as well as previous accomplishments of mitigation strategy efforts.

Open discussion was permitted at all public meetings for suggestions and/or comments regarding the plan update. Also, during general question and answer periods, comments (if any) were noted by the Southern Georgia Regional Commission staff and incorporated into the plan as appropriate.

Copies of the previous Plan were made available at each meeting, while relevant chapters and sections under discussion were photocopied and distributed to those in attendance for comments. Outside of the formal meetings, parts of the plan were e-mailed to certain individuals who were unable to attend the meetings, and their comments were sought. Copies of the previous Plan and the draft Plan Update document were also available on the Southern Georgia Regional Commission website and from the local EMA office and city and county government offices.

For the plan update, the Hazard Mitigation Plan Update Committee (HMPUC) used the prior Hazard Mitigation Plan as a basis, reviewing all chapters and sections and updating them as appropriate using national, state, and local data sources. The HMPUC reviewed the individual parts of the prior plan (with an emphasis on the hazards, goals, objectives, and action steps), and updated these elements through open discussion in which updates were noted by SGRC staff, who then used notes from the workshops to create the new Hazard Mitigation Plan document. The Wildfire section was updated using the Georgia Forestry Commission's "Community Wildfire Protection Plan" (see Appendix C). The CWPP was consulted to ensure consistency between the CWPP and HMP, and all action items from the CWPP that were still relevant were included as action steps in the HMP. Land use descriptions, information about zoning, and information about community services were updated using the current joint Comprehensive Plan for the County and Cities. Other documents used were the local Emergency Operations Plan, the previous Hazard Mitigation Plan, the State of Georgia Hazard Mitigation Plan, the Berrien County Flood Insurance Study, and information from the National Climatic Data Center (NCDC). The State Hazard mitigation plan was consulted to ensure the HMP would be consistent with this plan, and data from the NCDC were used to create the Hazard Frequency Table and associated information regarding each hazard, which can be found in Chapter 2. The County and Cities do not have a Flood Mitigation Assistance Plan.

B. Public Comment and Participation

The publication of a Public Notice in the legal organ is considered the legal method of notifying the public and inviting them to meetings.

The public was invited to attend and comment during two public hearings. The "kick-off" public hearing was advertised in the local newspaper (meeting advertisements and sign-in sheets are provided in Appendix E). A second and final public hearing was held on **[DATE to be inserted here once plan is approved by GEMA/FEMA, then hearing can be scheduled]** and was advertised in the local newspaper (see Appendix E). Citizens, including staff and members of the HMPUC, were present (see Appendix E). **There were no substantive comments other than those complimentary of the planning process itself. Therefore, there was no need to consider or add public comments [this will be updated once the 2nd hearing has been held].**

In addition, an e-mail list of stakeholders was kept up to date, including all the attendees who wrote their e-mail address on the sign-in sheet at each meeting, as well as any other interested

parties. Further reminders of meetings were provided as needed through telephone calls and in-person communication.

C. Mission and Vision Statements

The HMPUC decided on the following Mission Statement and Vision Statement in the original plan and re-confirmed them in this update to help guide them through the planning process.

Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City
Hazard Mitigation Plan Update Committee
Mission Statement

This committee’s mission is to make Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City and their citizens, local governments, communities, residences, and businesses less vulnerable to the effects of natural hazards. This will be accomplished through the effective administration of Hazard Mitigation Programs, hazard risk assessments, wise floodplain management, and a coordinated approach to mitigation policy through state, regional, and local planning activities.

Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City
Hazard Mitigation Plan Update Committee
Vision Statement

This committee’s vision is to institutionalize a local Hazard Mitigation ethic through leadership, professionalism, and excellence, thus leading the way to a safe, sustainable way of life for Berrien County and Alapaha, Enigma, Nashville, and Ray City.

Due to Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City being such close-knit communities, the Berrien County HMPUC chose not to break into subcommittees, but to address issues as a whole group. Various members of this group had direct knowledge relating to local infrastructure and agencies, emergency planning, hazard planning, and the operations of major departments and emergency services. Through their efforts, this Plan was developed.

The HMPUC was responsible for identifying natural hazard events and completing a profile, vulnerability assessment, potential loss estimation (see Chapter 2, Appendix A, and Appendix D), and updating the Georgia Mitigation Information System (GMIS) Critical Facilities Inventory (see Appendix F). They were also responsible for reviewing and updating the Mitigation Goals, Objectives, and Action Steps (see Chapter 4), among other responsibilities.

Section III. Plan Review, Analysis, and Revision

As mentioned above, the prior Hazard Mitigation Plan was used as a basis for the plan update. The Hazard Mitigation Plan Update Committee (HMPUC) reviewed all chapters and sections of the prior plan and updated them as appropriate, using national, state, and local sources. The HMPUC also reviewed all of the following relevant local planning documents and other materials, all of which were incorporated into the current plan update through analysis by the HMPUC and further analysis by SGRC staff.

- The Community Wildfire Protection Plan (see Appendix C)
- The current joint Comprehensive Plan for the County and Cities, which includes the five-year Community Work Program
- The Local Emergency Operations Plan
- The current State of Georgia Hazard Mitigation Strategy
- The local Service Delivery Strategy
- Flood Insurance Study
- Data from the National Climatic Data Center (NCDC).

SGRC staff used goals, strategies, projects, and other information from the above resources to help to develop the goals, priorities, and action steps that are listed in this current plan. After organizing resources, an update of the risk assessment was performed. New forms, worksheets, and data (included in the Appendix) were also completed. Afterward, the Mitigation Goals, Objectives, and Action Steps were reviewed to determine if they were to remain the same or be added to, modified, or removed.

All chapters of this Plan have been updated to reflect the new material. See the tables at the beginnings of the chapters for further information regarding which items were changed and updated.

Section IV. Organization of the Plan

This Plan focuses on seven natural hazards chosen by the HMPUC that may affect and cause damage to Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. Chapter 2, Chapter 4, and Appendix A are each subdivided into Sections I through VII; these sections reflect the 7 natural hazards that were chosen. The natural hazards are as follows (in order of priority):

1. Floods
2. Thunderstorms/Wind
3. Hurricanes/Tropical Storms
4. Drought
5. Wildfires
6. Hail
7. Tornadoes
8. Severe Winter Storms

Other hazards, such as Avalanche, Coastal Erosion, Coastal Storm, Dam Failure, Earthquake, Expansive Soils, Extreme Heat, Land Slide, SLOSH (Sea, Lake and Overland Surges from Hurricanes), Tsunami, and Volcano, were examined and determined not to be of sufficient significance in the community to warrant their inclusion in the present Hazard Mitigation Planning effort, based on past history and available data.

This Plan also contains a HAZUS report (see Appendix G - **pending**), a comprehensive range of Mitigation Goals, Objectives, and Action Steps (Chapter 4), and information on implementation, monitoring, and plan update and maintenance (see Chapter 6), as well as other FEMA-required items and materials (included in various Chapters, Sections and Appendices).

Throughout the effective time period of this Plan, the County Commissioners and City Council Members will assign staff, as appropriate, to implement the comprehensive range of Mitigation Goals, Objectives, and Action Steps and other pertinent items that are contained in this Plan.

The Berrien County and Alapaha, Enigma, Nashville, and Ray City Hazard Mitigation Plan exists in one bound volume appended with various papers and documents, as well as a PDF document that is available on the SGRC website. The planning efforts of Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City are intended to be an ongoing process and the Plan is to be amended as appropriate.

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Copies of the Plan are on file and may be examined at the County and City government offices, the County Emergency Management Agency, the Southern Georgia Regional Commission office (as well as the SGRC website, www.sgrc.us), and the Georgia Emergency Management and Homeland Security Agency (GEMHSA).

Section V. Local Hazard, Risk, and Vulnerability (HRV) Summary, Local Mitigation Goals, and Objectives

The HMPUC determined that the hazards established in the previous plan were still the most significant threats to the community, and their order of priority remains unchanged. A Hazard, Risk, and Vulnerability (HRV) Assessment has been formulated through a variety of information

obtained during the planning process. Information has been obtained from online databases, published sources, and personal accounts regarding hazards, their history in the community, and when and where they were active. This summary is provided in Chapter 2.

The vulnerability of the community to natural hazards is also summarized in the Hazard Frequency Table (see Appendix D), and the Inventory of Assets and number of people exposed to each hazard is evaluated in GEMA Worksheet 3A (see Appendix A). Critical Facilities and Critical Infrastructure are also examined as to the present value and potential losses from natural hazards (see Appendix F).

A description that identifies and analyses a comprehensive range of Mitigation Goals, Objectives, and Action Steps to reduce the effects of each hazard (based on risk assessment findings, with identifiable comprehensive ranges for each jurisdiction) is included in Chapter 4, Sections I-VII. In Chapter 6, Section I, there is a description related to prioritization of these Mitigation Goals, Objectives, and Action Steps through the use of cost/benefit analysis, STAPLEE (Social, Technical, Administrative, Political, Legal, Economic and Environmental), and other criteria. Also in Chapter 6, there are sections on Implementing the Action Plan (see Section I), Evaluation, Monitoring, Updating (see Section II), and Plan Update and Maintenance (see Section III).

Section VI. Multi-Jurisdictional Special Considerations

Berrien County has a total area of 452 square miles with a population density of 42.7 people per square mile (US Census data, 2010). As such, certain services, including emergency services, may have large distances to cover when responding to an event, which may negatively influence emergency response times and strain resources. Berrien County contains four incorporated cities: Alapaha, Enigma, Nashville (the county seat), and Ray City.

Each jurisdiction has its own fire department. All fire stations in the community are staffed by volunteers except for Nashville, which has 1 full time paid employee.

The following are the ISO Classes of fire districts in Berrien County and Alapaha, Enigma, Nashville, and Ray City

Station	ISO Class
Berrien County Fire Dept. – East Berrien	Class 9
Berrien County Fire Dept. – New Lois	Class 9
Berrien County Fire Dept. – West Berrien	Class 8B
Alapaha Fire Dept.	Class 6/9
Enigma Fire Dept.	Class 6/9
Nashville Fire Dept.	Class 4
Ray City Fire Dept.	Class 4

Section VII. Adoption, Implementation, Monitoring, and Evaluation

After all plan development workshops were concluded, the draft plan was submitted to all local governments for their review. The draft plan was then submitted to GEMA and FEMA for their review and approval. After their approval, and any recommended changes, a second and final public hearing was held on **[insert date here after GEMA/FEMA review]** in order to provide a further opportunity for public comment and review. After this final public hearing, resolutions adopting the plan were passed by the local governments on **[insert date here once the plan is adopted]** adopting the Plan Update. Copies of the public hearing advertisements and resolutions are available in Appendix E.

The comprehensive range of Mitigation Goals, Objectives, and Action Steps (see Chapter 4), which contains items related to all local governments, will be implemented as soon as possible and/or as funds become available to do so.

All sections of the Plan will be monitored and evaluated annually by the County Emergency Management Agency. Incremental accomplishments of Mitigation Goals Objectives and Action Steps will be reported to the public through appropriate means (TV, website, social media, local newspapers, City Council meetings, County Commission meetings, etc.).

The method that the County EMA will use to monitor the plan will be to conduct quarterly telephone interviews with the various local governments and area agencies in order to chart their plan progress. Also, throughout the year, a series of informal meetings will be held in which various aspects of the plan are discussed. In addition, annual evaluations of the plan will take place on or near the anniversary of the date of Plan adoption. The annual evaluation will assess which of the goals, objectives, and action steps have been achieved; whether those goals, objectives, and action steps still address current and expected conditions; whether the nature or magnitude of risks has changed; whether current resources are appropriate for implementing the plan; and whether agencies and other parties have participated as originally proposed.

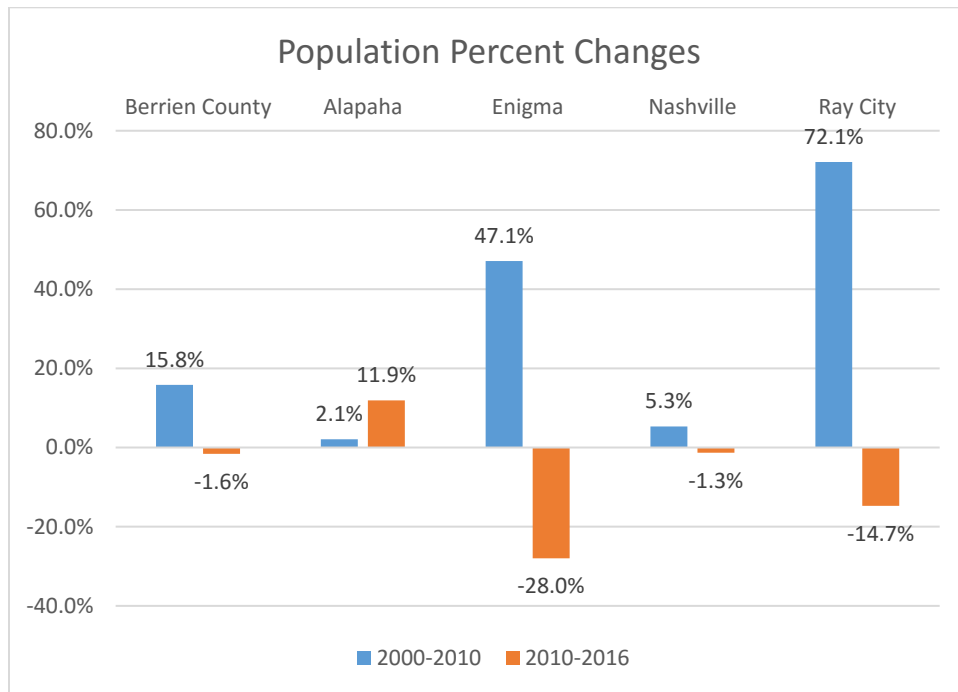
During this annual evaluation, problems (if any) with completing the action steps will be discussed, methods of resolving those problems (if any) will be formulated, the action steps will be updated (if necessary), and new actions steps will be developed (if necessary) in response to new problems that have developed throughout the year. If any changes or updates are needed to the other sections of the plan itself, these will also be discussed and noted. Critical Facilities and infrastructure changes and updates will also be discussed at this time and then added to the online GEMA database as required. New hazards in the area (if any) will be discussed and planned for and an assessment made as to whether community needs dictate additions to the materials of the plan.

The major criteria to measure plan success will be the number of goals, objectives, and action steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property. For further details on plan execution, see Chapter 6.

The Plan will be updated by the EMA Director and chosen representatives of all of the local governments every five years, as required by FEMA. All sections of this Plan will be updated at that time. The Plan update will be reviewed by all jurisdictions and relevant stakeholders. The requirements of this Hazard Mitigation Plan will be taken into consideration and incorporated

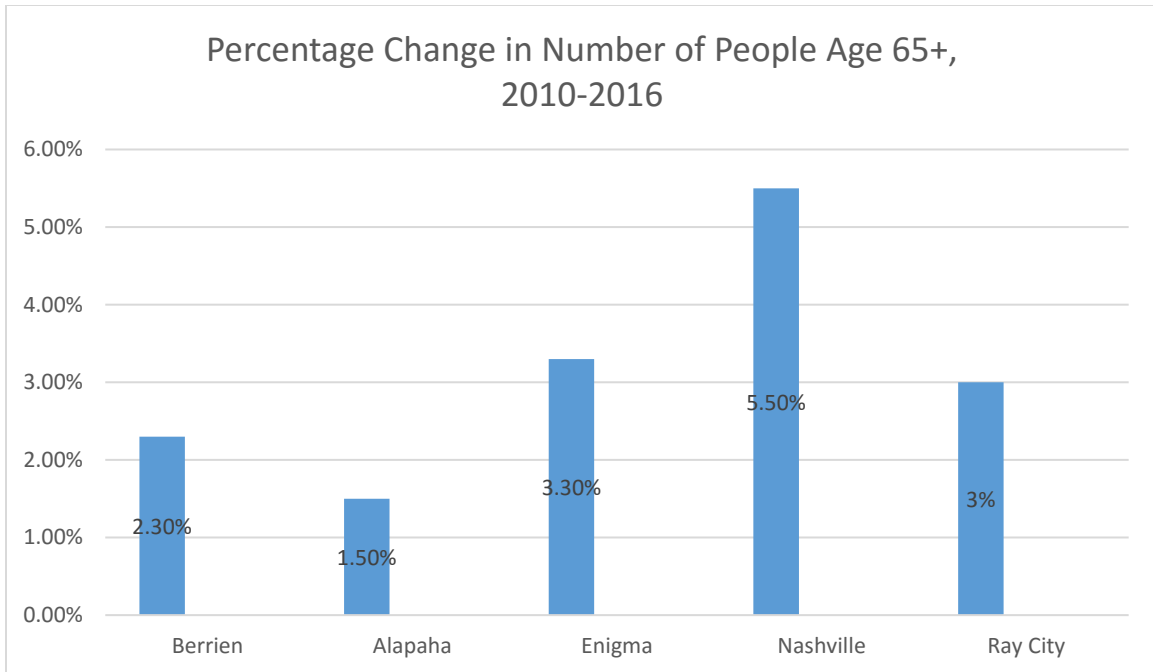
into Comprehensive Plans, Capital Improvement Plans, Local Emergency Operations Plans, and all other such Plans, as appropriate. This updating process will be publicly advertised and public comment solicited and incorporated as necessary and as appropriate.

Section VIII. Community Data

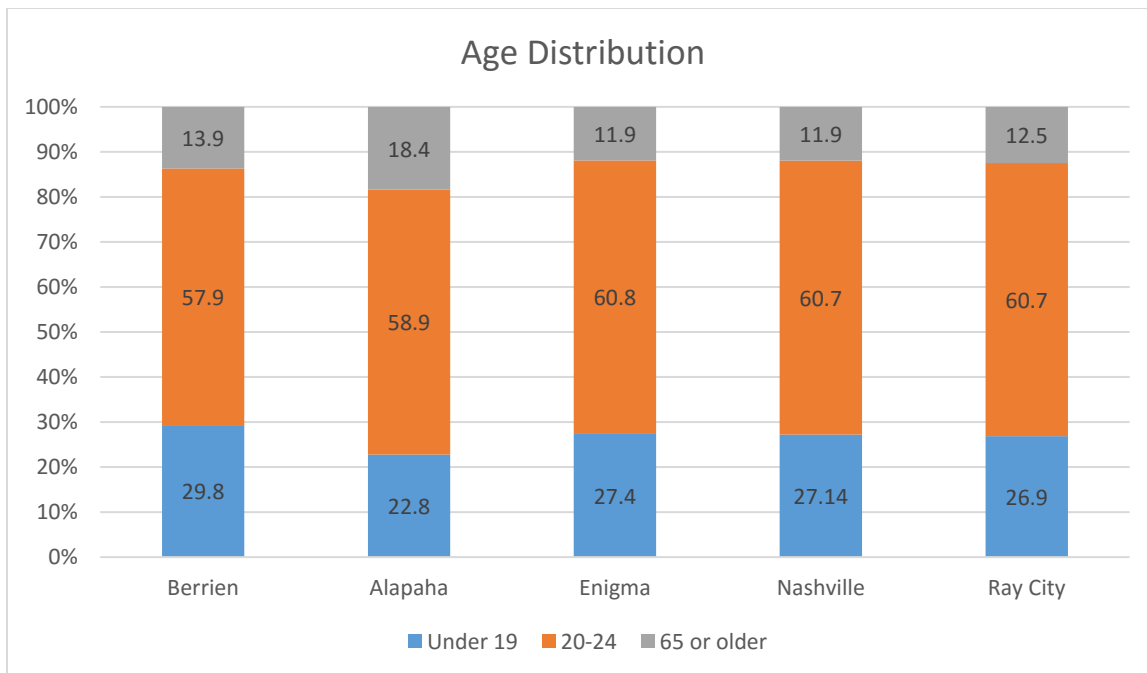


According to 2016 U.S. Census Bureau American Community Survey 5-year estimates, the population of Berrien County is 18,986, a decrease of 1.6% since 2010. The Town of Alapaha’s 2016 population is 763, an 11.9% increase since 2010. The Town of Enigma’s 2016 population is 920, a 28% decrease since 2010, the City of Nashville’s population is 4,895, a decrease of 1.3% since 2010. Ray City’s population is 1,095, a 14.7% decrease since 2010.

Between 2000 and 2010, Berrien County had a 15.8% increase in population, while the Town of Alapaha’s population increased by 2.1%, the Town of Enigma’s increased by 47.1%, the City of Nashville’s population increased by 5.3%, and Ray City’s population increased by 72.1%.



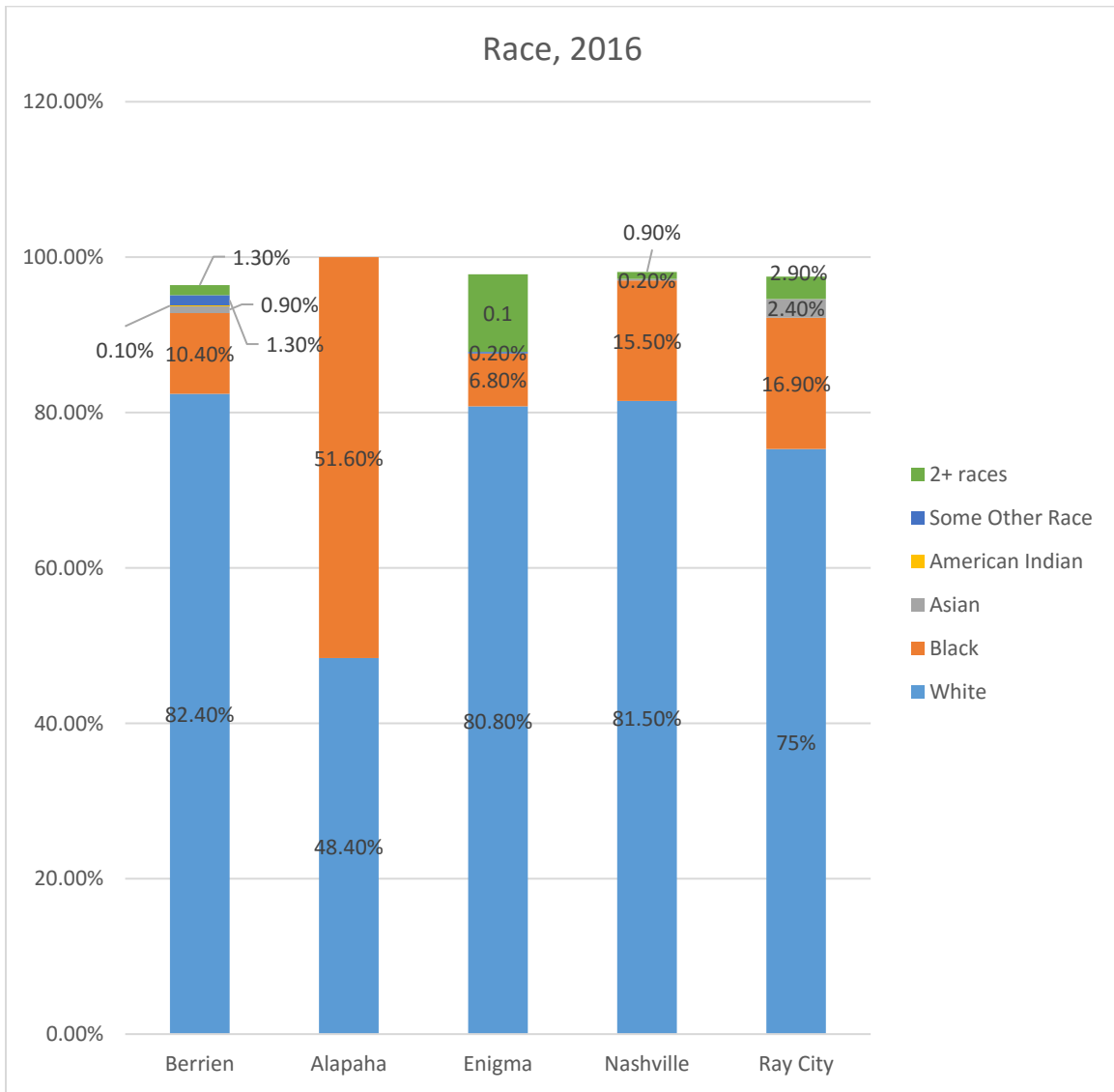
The total number of people aged 65 and older increased in Berrien County from 2010 to 2016 (2.3%). The number of people aged 65+ decreased in Alapaha (1.5%), and increased in Enigma (3.3%), Nashville (5.5%), and Ray City (3%).



According to 2016 estimates, the age distribution in Berrien County is 13.9% over 65, 57.9% ages 20-64, and 29.8% 19 and under. In the Town of Alapaha, the age distribution is 18.4% over 65, 58.9% ages 20-64, and 22.8% 19 and under. In the Town of Enigma the age distribution is 11.9% over 65, 60.8% ages 20-64, and 27.4% 19 and under, the City of Nashville is 21% over

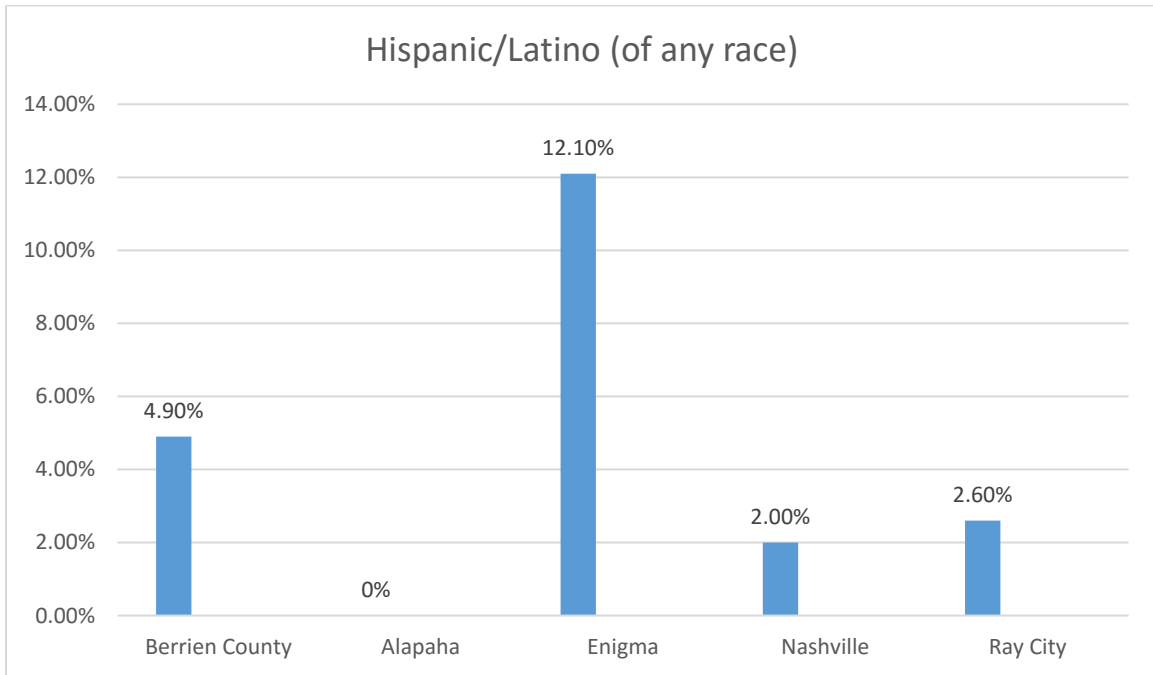
65, 51.9% ages 20-64, and 27.14% 19 and under and in the City of Ray City the age distribution is 12.5% over 65, 60.7% ages 20-64, and 26.9% 19 and under.

Berrien County's population is 51.4% female and 48.6% male, the Town of Alapaha's population is 58.3% female and 41.7% male, the Town of Enigma's population is 42.7% female and 57.3% male, the City of Nashville's population is 52.9% female and 47.1% male and the City of Ray City's population is 58.2% female and 41.8% male.

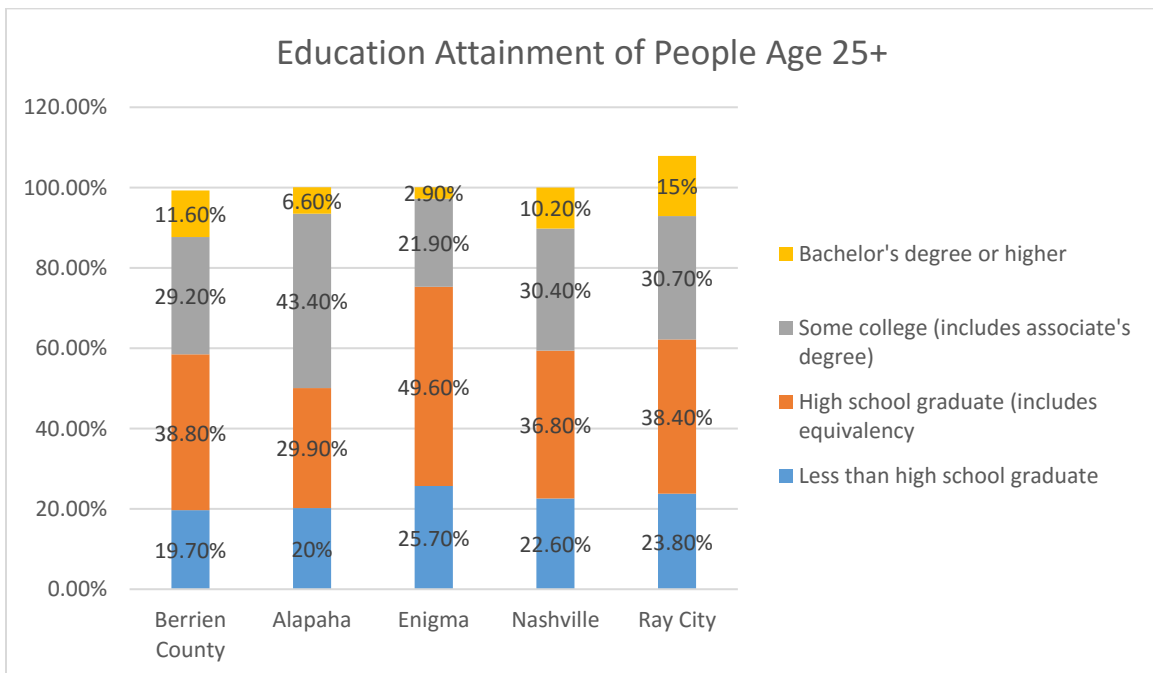


The population of Berrien County is 82.4% White/Caucasian, 10.4% Black/African American, 1.3% some other race, 1.3% two or more races, 0.9% Asian, and 0.1% Native American. The Town of Alapaha's population is 48.4% White/Caucasian and 51.6% Black/African American. The Town of Enigma's population is 80.8% White/Caucasian, 6.8% Black/African American, 0.2% some other race and 0.1% two or more races. The City of Nashville's population is 81.5% White/Caucasian, and 15.5% Black/African American, Asian 0.2% and two or more races 0.9%.

The City of Ray City's population is 75.3.0% White/Caucasian, 16.9% Black/African American, 2.4% Asian and 2.9% two or more races.

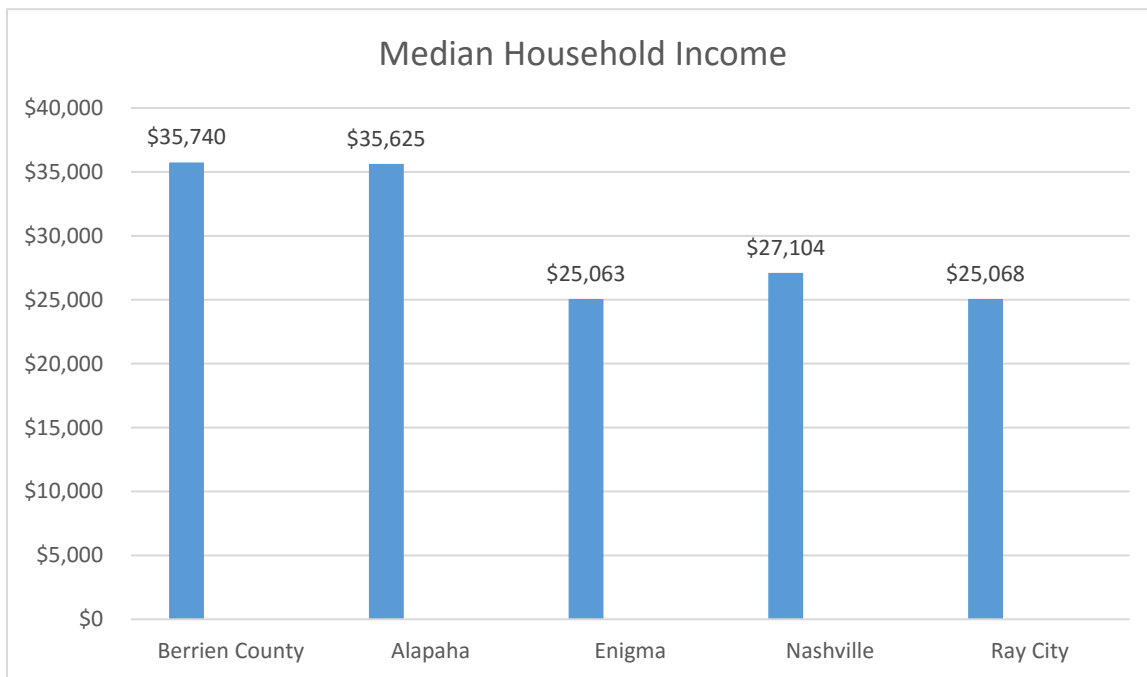


The percentage of the population that is Hispanic/Latino (of any race) is 4.9% in Berrien County, 0% in the Town of Alapaha, 12.1% in the Town of Enigma, 2.0% in the City of Nashville and 2.6% in the City of Ray City.

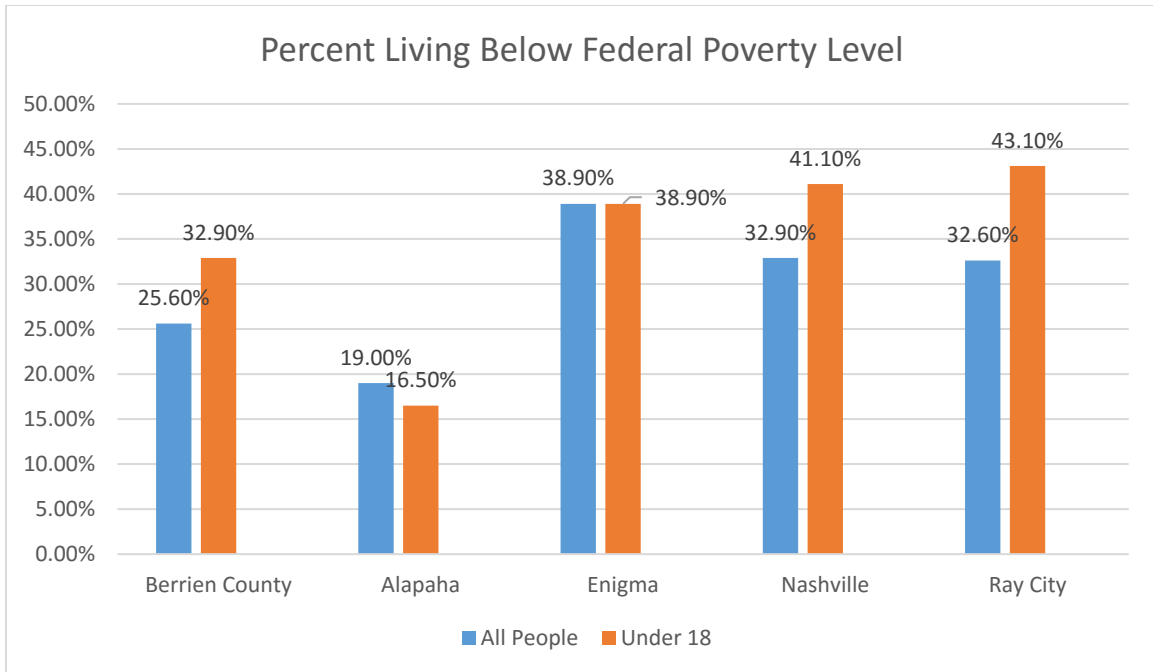


Among persons aged 25 or older, in Berrien County, 19.7% have no high school diploma, 38.8% are high school graduates (includes equivalency) with no further education, 29.2% have an

associate’s degree or some college, and 11.6% have a bachelor’s or higher degree. Among persons aged 25 or older in the Town of Alapaha, 20.2% have no high school diploma, 29.9% are high school graduates (includes equivalency) with no further education, 43.4% have an associate’s degree or some college, and 6.6% have a bachelor’s or higher degree. Among persons aged 25 or older in the Town of Enigma, 25.7% have no high school diploma, 49.6% are high school graduates (includes equivalency) with no further education, 21.9% have an associate’s degree or some college, and 2.9% have a bachelor’s or higher degree. Among persons aged 25 or older in the City of Nashville, 22.6% have no high school diploma, 36.8% are high school graduates (includes equivalency) with no further education, 30.4% have an associate’s degree or some college, and 10.2% have a bachelor’s or higher degree. Among persons 25 or older in the City of Ray City, 23.8% have no high school diploma, 38.4% are high school graduates (includes equivalency) with no further education, 30.7% have an associate’s degree or some college, and 15% have a bachelor’s degree or higher.



As of 2016 (US Census Bureau American Community Survey 5-year estimates), the median household income in Berrien County is \$35,740, the median household income in the Town of Alapaha is \$35,625, the median household income in the Town of Enigma is \$25,063, the median household income in the City of Nashville is \$27,104, and the median household income in the City of Ray City is \$25,068.



The percentage of the population living below the federal poverty level is estimated at 25.6% for Berrien County, 19.0% for the Town of Alapaha, 38.9% for the Town of Enigma, 32.9% for the City of Nashville, and 32.6% for the City of Ray City. For persons under 18, the percent living below the poverty level is estimated at 32.9% in Berrien County, 16.5% in the Town of Alapaha, 38.9% in the Town of Enigma, 41.1% in the City of Nashville, and 43.1% in the City of Ray City.

In 2016, according to the Bureau of Labor Statistics, the annual average seasonally-adjusted unemployment rate for Berrien County was 10.4%.

Source: U.S. Census Bureau (www.census.gov)

Chapter 2: Local Natural Hazard, Risk, And Vulnerability (HRV) Summary

Summary of changes:

During the plan update process, the HMPUC reviewed the hazards that may affect the community, and their priority. This updated plan includes the same seven natural hazards that were included in the previous plan, in the same order of priority. Table 2.1 provides a brief description of each section in this chapter and a summary of changes that have been made.

Chapter 2 Section	Updates to Section
I. Floods	Updated data and information; edited for clarity
II. Thunderstorms/Wind	Updated data and information; edited for clarity
III. Hurricanes/Tropical Storms	Updated data and information; edited for clarity
IV. Drought	Updated data and information; edited for clarity
V. Wildfires	Updated data and information; edited for clarity
VI. Hail	Updated data and information; edited for clarity
VII. Tornadoes	Updated data and information; edited for clarity
VIII. Severe Winter Storms	Updated data and information; edited for clarity

Table 2.1: Overview of updates to Chapter 2

Flood and wildfire are the only hazards for which the level of risk varies geographically within the county; the remaining hazards constitute an equal threat to all geographic areas of the community. For more information, including hazard maps, see Appendix A.

Other hazards, such as Avalanche, Coastal Erosion, Coastal Storm, Dam Failure, Earthquake, Expansive Soils, Extreme Heat, Land Slide, SLOSH (Sea, Lake and Overland Surges from Hurricanes), Tsunami, and Volcano, were examined and determined not to be of sufficient significance in the community to warrant their inclusion in the present Hazard Mitigation Planning effort, based on past history and available data.

Section I. Floods

A. Identification of Hazard

The threat of a flood has been chosen by the HMPUC as the first most likely hazard to occur and cause damage in the community, based on past experience, the FEMA-described methodology, and other factors. Historic data have been examined from various sources, including the National Climatic Data Center (see Appendix F), as well as from local history and personal accounts, in order to determine the frequency of events. For further information, see the HAZUS Report in Appendix G [pending].

Floods may occur at any time, in many cases without warning, and their effects can range from minor inconvenience to wholesale destruction. Floods are most often caused by heavy rains associated with thunderstorms, hurricanes, or tropical storms. Flooding can result from a rise in the level of a body of water such as a river or a lake, or from rain falling faster than it can be absorbed by the ground (especially under weather conditions that make soil less pervious, for example after a period of drought). Flooding frequently occurs in urban areas when a large amount of rain, above the capacity of the urban drainage system, falls on impervious surfaces such as streets, buildings, and parking lots. Flooding can also result from the failure of man-made structures such as levees and dams.

Flash floods are floods that occur in short time-spans, often so quickly that people are caught off-guard. Flash floods can occur as a result of any of the causes mentioned above, but are most often due to extremely heavy rainfall from thunderstorms. More information is available at the National Weather Service (<https://www.weather.gov/phi/FlashFloodingDefinition>).

According to the National Weather Service (<http://tadd.weather.gov/>), more deaths occur each year due to flooding than from any other thunderstorm-related hazard. The Centers for Disease Control and Prevention report that over half of all flood-related drownings occur when a vehicle is driven into hazardous flood water. The next highest percentage of flood-related deaths is due to walking into or near flood waters. People underestimate the force and power of water. Many of the deaths occur in automobiles as they are swept downstream. Of these drownings, many are preventable, but too many people continue to drive around the barriers that warn you the road is flooded. A mere 6 inches of fast-moving flood water can knock over an adult. It takes just 12 inches of rushing water to carry away a small car, while 2 feet of rushing water can carry away most vehicles. It is never safe to drive or walk into flood waters.

Flood zones, as defined by FEMA, are described in the table below.

Flood Zone Designations and Descriptions

Source: FEMA (<https://hazards.fema.gov/onlinelomc/ext/Help/loadInstructions>)

Zone Designations	Zone Descriptions
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas, no depths or base flood elevations are shown

	within these zones.
AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
AO	River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
A1-A30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a BFE (old format).
A99	Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.
AE	The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
V	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. No base flood elevations are shown within these zones.
V1-V30	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
VE	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
B	Area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods. Are also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.
C	Area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level.
D	Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.

X Shaded	Area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods. Are also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.
X Unshaded	Area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level.

Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City are all vulnerable to the effects of flooding. Areas within flood zones are naturally more vulnerable. For more information, see the maps in Appendix A.

B. Profile of Events, Frequency of Occurrences, Probability

According to the NOAA Storm Events Database (see Appendix F), there are 4 reports of floods occurring in Berrien County (including the Cities) between 01/01/1950 and 5/31/2018. The Historic Recurrence Interval is 17.00 years. This is a 5.88% Historic Frequency Chance per year. The past 10-year Record Frequency Per Year is 0.2, the past 20-year frequency is 0.2, and the past 50-year frequency is 0.08 (see the Hazard Frequency Table in Appendix D).

Since the previous Hazard Mitigation Plan was completed, one flood event has occurred. This event occurred on Dec. 24. 2014. Several roads were flooded in the western and northern portions of Berrien County due to heavy rainfall in a short period of time. According to local accounts, an estimated 3 inches of rain fell within two hours. Several roads were flooded, washed out, and impassable (with depths up to 5 inches) in the western and northern portions of Berrien county due to heavy rainfall in a short period of time. Traffic diversions were needed.

Although the most complete available data were used for this analysis, the possibility remains that other events may have occurred in the community that went unreported or underreported.

C./D.: Inventory of Assets Exposed and Potential Loss

In Worksheet 3A: Inventory of Assets (appearing in Appendix A), we estimate that all of Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City are equally vulnerable to this hazard. Because data broken down by jurisdiction are not consistently available, it was not possible to break down these worksheets by jurisdiction; therefore, they refer to the entire county, including the four cities.

An estimated 9.4% of the Residential property (660 of 7,025) in Berrien County (including the Cities of Alapaha, Enigma, Nashville, and Ray City) could be affected by this hazard, with a total value of \$29,207,991. Also, an estimated 20.3% of the Commercial, Industrial, Agricultural, Religious/Non-Profit, Government, Education and Utility properties (852 of 4,204) in the community may be affected, with a total value of \$206,737,492. The values are based on the most recent available tax roll data for Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City provided by the Berrien County Tax Assessor’s Office.

Damage to crops is not taken into account in any of these figures. According to the Center for Agribusiness & Economic Development's 2016 Georgia Farm Gate Value Report (http://caes2.caes.uga.edu/center/caed/documents/GAFGVR2016_DEC16.pdf), the total farm gate value of agricultural production in Berrien County is \$109,430,878

According to the inventory database reports and maps, 8 of the 94 Critical Facilities and Infrastructure for Berrien County (including the Cities of Alapaha, Enigma, Nashville, and Ray City) could be affected by this hazard. The total value of these Critical Facilities is \$1,674,901, plus a content value of \$79,000.

Many individuals do not have access to transportation and thus are susceptible to weather hazards. It is very important to notify these individuals through weather radios, radio stations, and other means so that they may seek shelter and/or make arrangements for transportation to shelter facilities. Therefore, a major consideration should be helping individuals, government, and non-profit organizations prepare for the pending flood hazard events.

The Georgia Mitigation Information System (GMIS) reports do not list any Repetitive Loss/NFIP properties in Berrien County or the Cities of Alapaha, Enigma, Nashville, and Ray City.

E. Land Use and Development Trends

Due to a combination of many factors most likely relating primarily to job opportunities and local economies, all jurisdictions except the Town of Alapaha have seen a decrease in population over the last few years. All five jurisdictions have zoning regulations and mandatory building and fire codes which are enforced by a building inspector. All Cities and the County participate in joint comprehensive planning and in the required updates of the Service Delivery Strategy. No changes have occurred in flood plain development or ordinances that could impact the vulnerability of the citizens in the community to floods. There have been no new residential developments that could be impacted by floods due to location. No homes or people have needed to be removed from flood areas. No other land use or development trends that relate to this hazard have been identified at this time.

F. Multi-Jurisdictional Differences

Berrien County as a whole has 11.22% of its area (32,977 acres) in Flood Zone "A" and 0.05% (155 acres) in Flood Zone "AE." The Town of Alapaha has 2.23% of its area (14.4 acres) in Flood Zone "A." The Town of Enigma has 9.97% of its area (214.5 acres) in Flood Zone "A." The City of Nashville has 13.61% of its area (407.9 acres) in Flood Zone "A." Ray City has 7.53% of its area (56.2 acres) in Flood Zone "A" and 16.85% of its area (125.7 acres) in Flood Zone "AE."

Berrien County and the Cities of Alapaha, Nashville, and Ray City are members of the National Flood Insurance Program. As of 2018, these jurisdictions are in compliance with NFIP requirements and intend to remain in compliance by enforcing flood plain ordinances (adopted by each jurisdiction in 2000) which prohibit or severely limit development in floodplains.

Ordinances are enforced by the Berrien County Code Enforcement Office, which serves the Cities of Alapaha and Ray City as well as the unincorporated county. The City of Nashville and Town of Enigma enforce their own ordinances. The Town of Enigma is not a member of the NFIP (Source: <https://www.fema.gov/cis/GA.html>), due to decisions made at the discretion of local officials. However, Enigma does have a flood plain ordinance, also adopted in 2000. Berrien County and the four Cities do not participate in the Community Rating System (CRS) program because they are not eligible.

(Source: <http://www.fema.gov/library/viewRecord.do?id=3629>).

The principal sources of flooding in Berrien County are the New River and the Withlacoochee River, which run along the western border of the County; and the Willacoochee and Alapaha Rivers, which run along the eastern border of the County. Reedy Creek and Futch Branch have been sources of flooding in the City of Nashville; Cat Creek and Beaverdam Creek have been sources of flooding in Ray City.

Cat Creek flows through the northwestern part of Ray City in a southerly direction. Tributaries that flow into Cat Creek include Tributary 2 which runs through the Northern part of Ray City, and Mill Race which runs through the central part of the city. Tributary 1 empties into Mill Race. Large magnitude floods have occurred in the Ray City vicinity and in Berrien County unincorporated areas.

There are no gauge records of flooding on Cat Creek or other streams within the Ray City area. However, large magnitude floods have occurred in the Ray City vicinity three times, prior to a FEMA study done in 2009. The Withlacoochee River near Nashville attained an estimated peak discharge of 5600 cubic feet per second, the greatest discharge recorded at that gauge station. No gauge records have been recorded since then. Another flood in the Ray City area occurred in August 1928 as part of a hurricane event. The recorded discharge for this flood is known only at downstream gauges.

Major flooding also occurred in Berrien County in March of 1998 (as part of Tropical Storm Earl, see Ch. 2, Section III), and flash flooding occurred March 2-4 and March 7-9, 2003. The simultaneous impact of Tropical Storm Bonnie and Hurricane Charley on August 13, 2004 also caused flooding across the entire state. Hurricane Frances, Hurricane Ivan, and Hurricane Jeanne also caused widespread flooding across the state in September of 2004. Hurricane Katrina caused widespread evacuations and localized flooding in August of 2005. There are no natural or manmade flood protection measures in Berrien County.

G. Overall HRV Summary of Events and Their Impact

Floods have the potential to cause damage at any place, at any time, throughout Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City and especially in flood-prone areas. Floods can happen quickly and residents may not have time to evade floodwaters. The cost of the damage and potential loss of life may be higher if the event strikes populated areas as opposed to more sparsely populated or unpopulated areas.

The HMPUC has developed a comprehensive range of Mitigation Goals, Objectives, and Action Steps to lessen the impacts from this hazard. These are contained in Chapter 4.

Since the previous plan was approved, there have not been any new developments, regulations, programs, or other changes in the community that would either increase or decrease the community's overall vulnerability to this hazard.

Section II. Thunderstorms/Wind

A. Identification of Hazard

The threat of thunderstorms and wind has been chosen by the Berrien County HMPUC as the second most likely hazard to occur and cause damage in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City, based on past experience, the FEMA-described methodology, and other factors. Historic data have been examined from various sources, including the National Climatic Data Center (see Appendix F), as well as from local history and personal accounts, in order to determine the frequency of events.

Thunderstorms are one of the most common weather products of our atmosphere and should not be underestimated. They can cause serious injury, substantial property damage, and even death. Dangers associated with thunderstorms include lightning, hail, heavy rain, flooding, and strong winds. Wind speeds in a thunderstorm can exceed 100 mph and can be as damaging as a tornado. Lightning associated with these events may be one of the leading causes of wildfire in Berrien County. Lightning can also occur even if it is not raining.

Thunderstorms are defined by NOAA as rain showers during which thunder is heard. The following are some of the most common thunderstorms types:

(Source: <http://www.nssl.noaa.gov/education/svrwx101/thunderstorms/types/>)

- **Single-cell thunderstorms**, often called “popcorn” convection, are small, brief, weak storms that grow and die within an hour or so. They are typically driven by heating on a summer afternoon. Single-cell storms may produce brief heavy rain and lightning.
- A **multi-cell storm** is a common type of thunderstorm in which new updrafts form along the leading edge of rain-cooled air (the gust front). Individual cells usually last 30 to 60 minutes, while the system as a whole may last for many hours. Multicell storms may produce hail, strong winds, brief tornadoes, and/or flooding.
- A **squall line** is a group of storms arranged in a line, often accompanied by “squalls” of high wind and heavy rain. Squall lines tend to pass quickly and are less prone to produce tornadoes than are supercells. They can be hundreds of miles long but are typically only 10 or 20 miles wide.
- A **supercell** is a long-lived (greater than 1 hour) and highly organized storm feeding off an updraft (a rising current of air) that is tilted and rotating. This rotating updraft - as large as 10 miles in diameter and up to 50,000 feet tall - can be present as much as 20 to 60 minutes before a tornado forms. Scientists call this rotation a mesocyclone when it is detected by Doppler radar. The tornado is a very small extension of this larger rotation. Most large and violent tornadoes come from supercells.

Wind is categorized, according to its strength and severity, using the Beaufort Wind Scale, developed in 1805 by Sir Francis Beaufort of the U.K. Royal Navy. The Beaufort Wind Scale is shown in the table below. (Source: <http://www.spc.noaa.gov/faq/tornado/beaufort.html>)

Beaufort Wind Scale

Force	Wind (Knots)	Wind (Mph)	World Meteorological Organization (WMO) Classification	Appearance of Wind Effects	
				On the Water	On Land
0	Less than 1	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	4-7	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	8-12	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	13-18	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	19-24	Fresh Breeze	Moderate waves 4-8 ft taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	25-31	Strong Breeze	Larger waves 8-13 ft, whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	32-38	Near Gale	Sea heaps up, waves 13-19 ft, white foam streaks off breakers	Whole trees moving, resistance felt walking against wind
8	34-40	39-46	Gale	Moderately high (18-25 ft) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Twigs breaking off trees, generally impedes progress
9	41-47	47-54	Strong Gale	High waves (23-32 ft), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	55-63	Storm	Very high waves (29-41 ft) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	64-72	Violent Storm	Exceptionally high (37-52 ft) waves, foam patches cover sea, visibility more reduced	Very rarely experienced; accompanied by widespread damage.
12	64+	73+	Hurricane	Air filled with foam, waves over 45 ft, sea completely white with driving spray, visibility greatly reduced	Devastation.

B. Profile of Events, Frequency of Occurrences, Probability

According to the NOAA Storm Events Database (see Appendix F), there are 95 reports of Thunderstorm/Wind events occurring in Berrien County (including the Cities) between 01/01/1950 and 12/31/2018. In some cases, multiple events occurred on the same day. The numbers reported here are the total number of events. The Historic Recurrence Interval is 0.73 years. This is a 137.68% Historic Frequency Chance per year. The past 10-year Record Frequency Per Year is 6.6, the past 20-year frequency is 3.85, and the past 50-year frequency is 1.88 (see the Hazard Frequency Table in Appendix D).

Since the previous Hazard Mitigation Plan became effective, 32 Thunderstorm/Wind events have occurred. Individual events have impacted only certain parts of the county, but collectively, over the past few years, the entire county and all the cities have been impacted at some point by thunderstorm/wind events and damage associated with them, including but not limited to downed trees, blocked roads, downed power lines, power outages, and roads temporarily closed due to rainfall. In some cases, multiple events occurred on the same day. The numbers reported here are the total number of events. One example is a severe storm that occurred on March 3, 2016. Wind speeds were measured at 55 knots. Approximately 3 inches of rain fell. Although there were no injuries, there were power outages in some residential areas lasting for several hours. An oak tree was blown down, causing an estimated \$25,000 in damage to a home. Several other storm events have caused trees to fall on power lines.

Although the most complete available data were used for this analysis, the possibility remains that other events may have occurred in the community that went unreported or underreported.

C./D.: Inventory of Assets Exposed and Potential Loss

In Worksheet 3A: Inventory of Assets (appearing in Appendix A), we estimate that all of Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City are equally vulnerable to this hazard. Because data broken down by jurisdiction are not consistently available, it was not possible to break down these worksheets by jurisdiction; therefore, they refer to the entire county, including the four cities.

An estimated 100% of the Residential property (7,025 of 7,025) in Berrien County (including the Cities of Alapaha, Enigma, Nashville, and Ray City) could be affected by this hazard, with a total value of \$384,937,709. Also, an estimated 100% of the Commercial, Industrial, and Agricultural, Religious/Non A Profit, Government, Education and Utility properties (4,204 of 4,204) in the community may be affected, with a total value of \$881,991,556. The values are based on the most recent available tax roll data for Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City provided by the Berrien County Tax Assessor's Office.

Damage to crops is not taken into account in any of these figures. According to the Center for Agribusiness & Economic Development's 2016 Georgia Farm Gate Value Report (http://caes2.caes.uga.edu/center/caed/documents/GAFGVR2016_DEC16.pdf), the total farm gate value of agricultural production in Berrien County is \$119,970,773

According to the inventory database reports and maps, all of the 94 Critical Facilities and Infrastructure for Berrien County (including the Cities of Alapaha, Enigma, Nashville, and Ray City) could be affected by this hazard. The total value of these Critical Facilities is \$187,642,316, plus a content value of \$85,300.

E. Land Use and Development Trends

All jurisdictions except the Town of Alapaha have seen a decrease in population over the last few years. All five jurisdictions have zoning regulations and mandatory building and fire codes which are enforced by a building inspector. All Cities and the County participate in joint comprehensive planning and in the required updates of the Service Delivery Strategy. No other land use or development trends that relate to this hazard have been identified at this time.

F. Multi-Jurisdictional Differences

Thunderstorm/Wind events are usually area-wide, and no difference in severity is expected between Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. However, the impact may be more severe in places with higher population density due to more people being in danger, more people needing to be evacuated, more debris from damaged buildings, and other impacts associated with higher population density.

G. Overall HRV Summary of Events and Their Impact

Thunderstorm/wind events can cause damage at any place, at any time, throughout Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City, especially during thunderstorms. Lightning strikes cannot be accurately predicted and residents may not have time to seek shelter. The cost of the damage and potential loss of life may be higher if the event strikes populated areas as opposed to more sparsely populated or unpopulated areas.

The HMPUC has developed a comprehensive range of Mitigation Goals, Objectives, and Action Steps to lessen the impacts from this hazard. These are contained in Chapter 4.

Since the previous plan was approved, there have not been any new developments, regulations, programs, or other changes in the community that would either increase or decrease the community's overall vulnerability to this hazard.

Section III. Hurricanes/Tropical Storms

A. Identification of Hazard

The threat of hurricanes/tropical storms has been chosen by the HMPUC as the third most likely hazard to occur and cause damage in the community, based on past experience, the FEMA-described methodology, and other factors. Historic data have been examined from various sources, including the National Climatic Data Center (see Appendix F), as well as from local history and personal accounts, in order to determine the frequency of events. For further information, see the HAZUS Report in Appendix G [pending].

Hurricanes and tropical storms are both types of tropical cyclones. Tropical cyclones are the general term used for all circulating weather systems over tropical water.¹ Tropical cyclones are destructive and have the potential to cause great damage and loss of life. They are divided into four major types: Hurricanes, Tropical Storms, Tropical Disturbances, and Tropical Depressions.

A hurricane, also known as a typhoon, is defined by NOAA's National Hurricane Center (<http://www.nhc.noaa.gov/aboutgloss.shtml>) as a tropical cyclone in which the maximum sustained surface wind (using the U.S. 1-minute average) is 64 kt (74 mph or 119 km/hr) or more. The term hurricane is used for Northern Hemisphere tropical cyclones east of the International Dateline to the Greenwich Meridian. The term typhoon is used for Pacific tropical cyclones north of the Equator west of the International Dateline.

A tropical storm is defined as tropical cyclone in which the maximum sustained surface wind speed (using the U.S. 1-minute average) ranges from 34 kt (39 mph or 63 km/hr) to 63 kt (73 mph or 118 km/hr).

A tropical disturbance is a discrete tropical weather system of apparently organized convection -- generally 100 to 300 nmi in diameter -- originating in the tropics or subtropics, having a nonfrontal migratory character, and maintaining its identity for 24 hours or more. It may or may not be associated with a detectable perturbation of the wind field.

A tropical depression is defined as tropical cyclone in which the maximum sustained surface wind speed (using the U.S. 1-minute average) is 33 kt (38 mph or 62 km/hr) or less.

The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 categorization based on the hurricane's intensity at the indicated time. The scale provides examples of the type of damage and impacts in the United States associated with winds of the indicated intensity. The following table shows the scale broken down by winds:

¹ A tropical cyclone is defined by NOAA as "a warm-core non-frontal synoptic-scale cyclone, originating over tropical or subtropical waters, with organized deep convection and a closed surface wind circulation about a well-defined center. Once formed, a tropical cyclone is maintained by the extraction of heat energy from the ocean at high temperature and heat export at the low temperatures of the upper troposphere. In this they differ from extratropical cyclones, which derive their energy from horizontal temperature contrasts in the atmosphere (baroclinic effects)." (<http://www.nhc.noaa.gov/aboutgloss.shtml>)

SAFFIR-SIMPSON HURRICANE SCALE

(Source: NOAA <http://www.nhc.noaa.gov/aboutgloss.shtml>)

Category	Wind Speed	Damage
1	74 - 95	Very dangerous winds will produce some damage
2	96 - 110	Extremely dangerous winds will cause extensive damage
3	111 - 129	Devastating damage will occur
4	130 - 156	Catastrophic damage will occur
5	> 156	Catastrophic damage will occur

The official Atlantic hurricane season (which includes Gulf Coast and East Coast hurricanes) is June 1 through November 30, but hurricanes and tropical storms may also occur outside of those dates. Whether the hurricane/tropical storm is a short-term event or a long term event depends on many factors including category, strength, speed, and impact of other weather systems, including fronts and wind patterns.

Because of their location, Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City are vulnerable to severe hurricanes/tropical storms forming in both the Atlantic Ocean and the Gulf of Mexico. Also due to location, hurricanes may degrade into tropical storms, tropical depressions, or tropical disturbances by the time they reach this area. These may or may not contain tornadoes or hail. In some cases, tropical storms, depressions, or disturbances may never reach hurricane strength before reaching the shore. The effects vary depending on the severity of the hurricane/tropical storm and the duration of the event.

B. Profile of Events, Frequency of Occurrences, Probability

According to the NOAA Storm Events Database (see Appendix F), there are 9 reports of Hurricanes/Tropical Storms occurring in Berrien County (including the Cities) between 01/01/1950 and 12/31/2018. The Historic Recurrence Interval is 7.67 years. This is a 13.04% Historic Frequency Chance per year. The past 10-year Record Frequency Per Year is 0.3, the past 20-year frequency is 0.4, and the past 50-year frequency is 0.18 (see the Hazard Frequency Table in Appendix D).

Since the previous Hazard Mitigation Plan was completed, two Hurricane/Tropical Storm events have occurred. On Sept. 2, 2016, Tropical Storm Hermine caused widespread power outages, downed power lines, impassable roads due to fallen trees, and damage to homes and other structures, with the total cost estimated at \$75,000. On Sept. 10, 2017, Tropical Storm Irma caused widespread power outages, downed power lines, impassable roads due to fallen trees, and damage to homes and other structures. The total cost was estimated at \$1 million. On Oct. 10, 2018, Tropical Storm Michael caused an estimated \$100,000 worth of property damage, as well as widespread power outages, downed power lines, impassable roads due to fallen trees, and damage to homes and other structures. Some residents evacuated voluntarily; evacuation data are not yet available.

Although the most complete available data were used for this analysis, the possibility remains that other hurricane/tropical storm events may have occurred in the community that went unreported or underreported.

C./D.: Inventory of Assets Exposed and Potential Loss

In Worksheet 3A: Inventory of Assets (appearing in Appendix A), we estimate that all of Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City are equally vulnerable to hurricanes/tropical storms. Because data broken down by jurisdiction are not consistently available, it was not possible to break down these worksheets by jurisdiction; therefore, they refer to the entire county, including the four cities. The County has a wind hazard score of 3 (101-110 mph gust). A map of the wind hazard scores and critical facilities is provided in Appendix A.

An estimated 100% of the Residential property (7,025 of 7,025) in Berrien County (including the Cities of Alapaha, Enigma, Nashville, and Ray City) could be affected by this hazard, with a total value of \$384,937,709. Also, an estimated 100% of the Commercial, Industrial, Agricultural, Religious/Non-Profit, Government, Education and Utility properties (4,204 of 4,204) in the community may be affected, with a total value of \$881,991,556. The values are based on the most recent available tax roll data for Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City provided by the Berrien County Tax Assessor's Office.

Damage to crops is not taken into account in any of these figures. According to the Center for Agribusiness & Economic Development's 2016 Georgia Farm Gate Value Report (http://caes2.caes.uga.edu/center/caed/documents/GAFGVR2016_DEC16.pdf), the total farm gate value of agricultural production in Berrien County is \$119,970,773

According to the inventory database reports and maps, all of the 94 Critical Facilities and Infrastructure for Berrien County (including the Cities of Alapaha, Enigma, Nashville, and Ray City) could be affected by this hazard. The total value of these Critical Facilities is \$187,642,316, plus a content value of \$85,300.

E. Land Use and Development Trends

All jurisdictions except the Town of Alapaha have seen a decrease in population over the last few years. All five jurisdictions have zoning regulations and mandatory building and fire codes which are enforced by a building inspector. All Cities and the County participate in joint comprehensive planning and in the required updates of the Service Delivery Strategy. No other land use or development trends that relate to this hazard have been identified at this time.

F. Multi-Jurisdictional Differences

Hurricane/tropical storm events are usually area-wide, and no difference in severity is expected between Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. However, the impact may be more severe in places with higher population density due to more people being in danger, more people needing to be evacuated, more debris from damaged buildings, and other impacts associated with higher population density. In jurisdictions without building codes and inspections, structures may exist that are not built to code and therefore may be especially vulnerable to the effects of strong winds and other hazards.

G. Overall HRV Summary of Events and Their Impact

Hurricanes/tropical storms have the potential to cause damage at any place, at any time, throughout Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. They are usually preceded by some watch or warning well in advance. The cost of the damage and potential loss of life may be higher if the path of the hurricanes/tropical storms covers populated areas as opposed to more sparsely populated or unpopulated areas.

The Berrien County HMPUC has developed a comprehensive range of Mitigation Goals, Objectives, and Action Steps to lessen the impacts from this hazard. These are contained in Chapter 4.

Since the previous plan was approved, there have not been any new developments, regulations, programs, or other changes in the community that would either increase or decrease the community's overall vulnerability to this hazard.

Section IV. Drought

A. Identification of Hazard

A drought is a prolonged period of abnormally low rainfall, with an accompanying water shortage. The threat of drought has been chosen by the HMPUC as the fourth most likely hazard to occur and cause damage in the community, based on past experience, the FEMA-described methodology, and other factors. Historic data have been examined from various sources, including the National Climatic Data Center and U.S. Drought Monitor (see Appendix F), as well as from local history and personal accounts, in order to determine the frequency of events.

Although drought is associated with the summer months in many other parts of the United States, our region has a humid subtropical climate with more precipitation, on average, in the summer than in the winter. Drought can occur at any time, and its effects can last throughout the year and continue from year to year. These effects may include agricultural losses, increased wildfire and fire risk, lack of water for citizens and firefighting, increased flooding risk (because dry land can be less absorbent of rainfall), and other effects that influence other hazards and the safety of the community.

Crops (including trees) are usually most adversely affected by drought events, along with community residents whose water supplies are restricted or cut off (especially those using individual wells). Residents of unincorporated Berrien County have wells, which may go dry during drought periods, thus leaving those residents without water for extended periods of time. The Cities of Alapaha, Enigma, Nashville, and Ray City have municipal water systems.

The U.S. Drought Monitor (<http://droughtmonitor.unl.edu>), established in 1999, is a weekly map of drought conditions that is produced jointly by the National Oceanic and Atmospheric Administration, the U.S. Department of Agriculture, and the National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln. The U.S. Drought Monitor website is hosted and maintained by the NDMC. The Drought Monitor summary map identifies general drought areas, labelling droughts by intensity, with D1 being the least intense and D4 being the most intense. Descriptions of these categories are provided in the table below (source: <http://droughtmonitor.unl.edu/AboutUs/ClassificationScheme.aspx>).

Category	Description	Possible Impacts
D0	Abnormally Dry	Going into drought: <ul style="list-style-type: none"> ▪ short-term dryness slowing planting, growth of crops or pastures Coming out of drought: <ul style="list-style-type: none"> ▪ some lingering water deficits ▪ pastures or crops not fully recovered
D1	Moderate Drought	<ul style="list-style-type: none"> ▪ Some damage to crops, pastures ▪ Streams, reservoirs, or wells low, some water shortages developing or imminent ▪ Voluntary water-use restrictions requested
D2	Severe Drought	<ul style="list-style-type: none"> ▪ Crop or pasture losses likely ▪ Water shortages common ▪ Water restrictions imposed
D3	Extreme Drought	<ul style="list-style-type: none"> ▪ Major crop/pasture losses ▪ Widespread water shortages or restrictions
D4	Exceptional Drought	<ul style="list-style-type: none"> ▪ Exceptional and widespread crop/pasture losses ▪ Shortages of water in reservoirs, streams, and wells creating water emergencies

Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City are all equally vulnerable to the effects of drought.

B. Profile of Events, Frequency of Occurrences, Probability

According to NOAA data (see Appendix F), there are 27 reports of drought events (D1, D2, D3, or D4) occurring in Berrien County (including the Cities) between 01/01/1950 and 5/31/2018. The Historic Recurrence Interval is 2.52 years. This is a 39.71% Historic Frequency Chance per year. The past 10-year Record Frequency Per Year is 2.2, the past 20-year frequency is 1.15, and the past 50-year frequency is 0.46 (see the Hazard Frequency Table in Appendix D).

Since the previous Hazard Mitigation Plan became effective, 4 drought events have occurred. All these events have caused crop losses and increased the risk of wildfires. The worst recent drought event during this time period brought D2 (severe drought) conditions to Berrien County, persisting for at least two weeks from mid-November to early December 2016.

Although the most complete available data were used for this analysis, the possibility remains that other events may have occurred in the community that went unreported or underreported.

C./D.: Inventory of Assets Exposed and Potential Loss

In Worksheet 3A: Inventory of Assets (appearing in Appendix A), we estimate that all of Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City are equally vulnerable to this hazard. Because data broken down by jurisdiction are not consistently available, it was not possible to break down these worksheets by jurisdiction; therefore, they refer to the entire county, including the four cities.

An estimated 100% of the Residential property (7,025 of 7,025) in Berrien County (including the Cities of Alapaha, Enigma, Nashville, and Ray City) could be affected by this hazard, with a total value of \$384,937,709. Also, an estimated 100% of the Commercial, Industrial, Agricultural, Religious/Non-Profit, Government, Education and Utility properties (4,204 of 4,204) in the community may be affected, with a total value of \$881,991,556. The values are based on the most recent available tax roll data for Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City provided by the Berrien County Tax Assessor's Office.

Damage to crops is not taken into account in any of these figures. According to the Center for Agribusiness & Economic Development's 2016 Georgia Farm Gate Value Report (http://caes2.caes.uga.edu/center/caed/documents/GAFGVR2016_DEC16.pdf), the total farm gate value of agricultural production in Berrien County is \$119,970,773

According to the inventory database reports and maps, all of the 94 Critical Facilities and Infrastructure for Berrien County (including the Cities of Alapaha, Enigma, Nashville, and Ray City) could be affected by this hazard. The total value of these Critical Facilities is \$187,642,316, plus a content value of \$85,300.

E. Land Use and Development Trends

All jurisdictions except the Town of Alapaha have seen a decrease in population over the last few years. All five jurisdictions have zoning regulations and mandatory building and fire codes which are enforced by a building inspector. All Cities and the County participate in joint comprehensive planning and in the required updates of the Service Delivery Strategy. No water usage restrictions are known to have been imposed, although there have been isolated incidents where residences served by individual wells have needed to limit water usage in order to avoid their wells drying up. No other land use or development trends that relate to this hazard have been identified at this time.

F. Multi-Jurisdictional Differences

Residents of unincorporated Berrien County get their water from wells, which may go dry during drought periods, thus leaving those residents without water for extended periods of time. The Cities of Alapaha, Enigma, Nashville, and Ray City have municipal water systems and are therefore their residents are less likely to run out of water than those residing in unincorporated areas served by individual wells. No other multi-jurisdictional differences have been identified at this time.

G. Overall HRV Summary of Events and Their Impact

Drought has the potential to harm people and the economy throughout Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City potentially at any time of the year, and most significantly in unincorporated areas not served by municipal water systems. Drought may increase the likelihood of wildfires and flooding. Water shortages can impede firefighting efforts at all levels.

The HMPUC has developed a comprehensive range of Mitigation Goals, Objectives, and Action Steps to lessen the impacts from this hazard. These are contained in Chapter 4.

Since the previous plan was approved, there have not been any new developments, regulations, programs, or other changes in the community that would either increase or decrease the community's overall vulnerability to this hazard.

Section V. Wildfires

A. Identification of Hazard

Wildfire is a large, destructive fire that spreads quickly over woodland or brush. The threat of wildfire has been chosen by the HMPUC as the fifth most likely hazard to occur and cause damage in the community, based on past experience, the FEMA-described methodology, and other factors. Historic data have been examined from various sources, including the National Climatic Data Center and Georgia Forestry Commission (see Appendix F), as well as from local history and personal accounts, in order to determine the frequency of events.

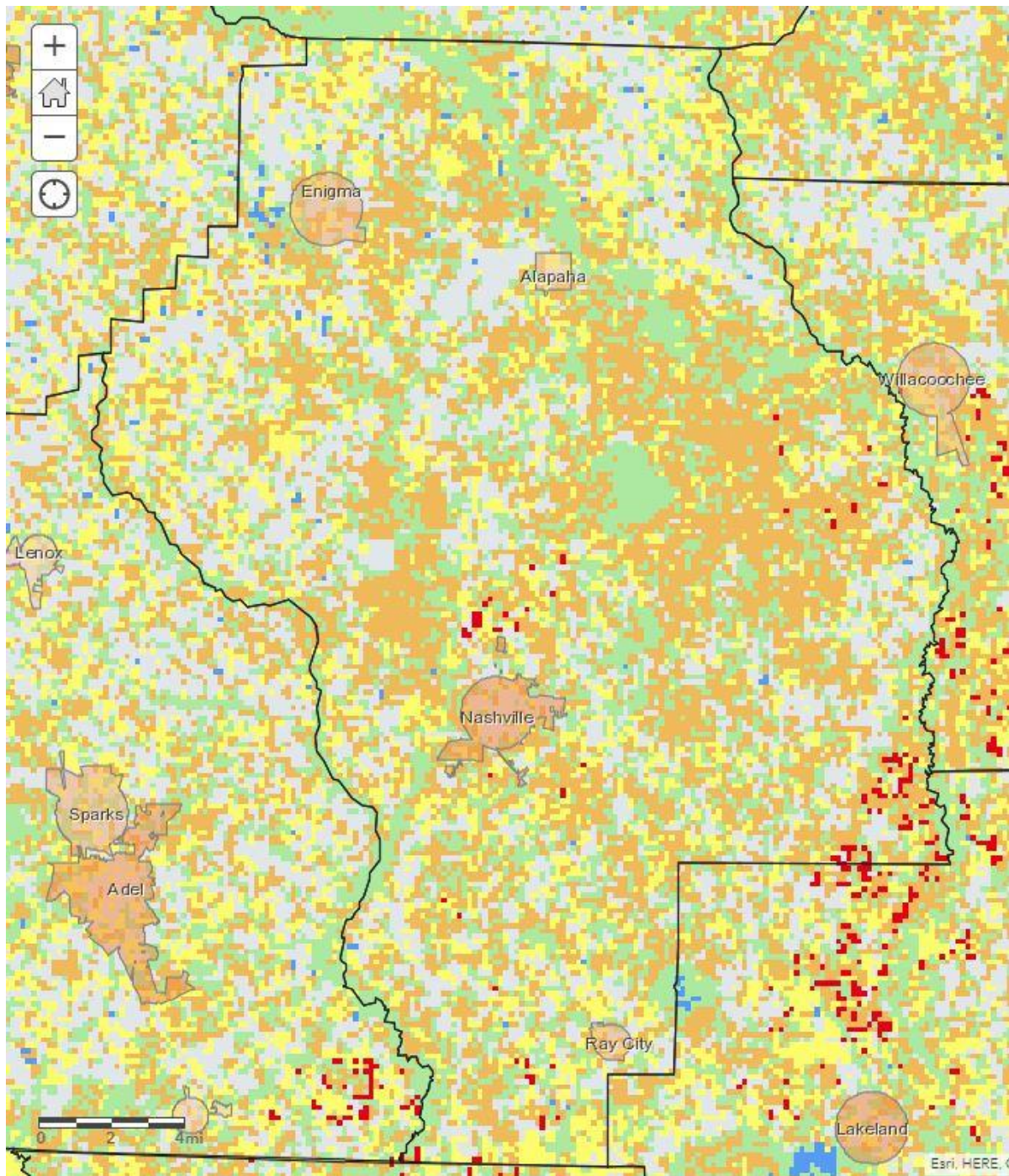
Much of southern Georgia is covered by forests, and fires play an important role in the health of forest ecosystems by breaking down organic matter into soil nutrients and helping seeds to germinate (source: NASA, https://earthobservatory.nasa.gov/Features/GlobalFire/fire_2.php). When naturally occurring wildfires are suppressed, combustible fuel (such as dead leaves and branches) accumulates in the forest. This increases the risk of larger, more destructive fire events in the future. Controlled, prescribed fires lower the risk of larger fire events and are beneficial to forest health (source: USDA, <https://www.fs.usda.gov/detail/dbnf/home/?cid=stelprdb5281464>).

Low humidity, lack of recent precipitation (or drought conditions), wind speed, and temperature are a combination of weather conditions that favor the kindling and spread of wildfires. A high fuel load (i.e. the accumulation of dead vegetation), in combination with the above, also provides for the kindling and spread of wildfires. Much of Berrien County, including some areas near the Cities, is forested with commercial and free-growing pine trees and other trees. These trees can and do catch fire frequently in both small and large fire events.

According to NASA (<https://earthobservatory.nasa.gov/IOTD/view.php?id=89757>), an estimated 84 percent of wildfires are caused by humans. Some common ways that people start fires include discarding cigarettes, leaving campfires unattended, and losing control of prescribed burns or crop fires. Sparks from railroads and power lines, as well as arson, also routinely cause wildfires.

When a residential area, whether it be a single home or an entire subdivision, is adjacent to an area containing vegetative fuels, such as a forest or other wooded area, this is referred to as a Wildland-Urban Interface area (WUI). These are the areas at greatest risk for property damage due to Wildfire.

Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City are all vulnerable to the effects of wildfires. The USDA Forest Service assigns areas a Wildfire Hazard Potential (WHP) score of Very Low, Low, Moderate, High, or Very High. As the map below shows, most of Berrien County is scored either Low, Moderate, High, or Non-burnable.



Data Source: USDA Forest Service and Fire Modeling Institute
<https://www.arcgis.com/home/item.html?id=f291ac4840984de5a0cf842d8d7a0973>

B. Profile of Events, Frequency of Occurrences, Probability

According to Georgia Forestry Commission data (see Appendix F), there are 4,030 reports of wildfires occurring in Berrien County (including the Cities) between 01/01/1968 and 12/31/2017. The Historic Recurrence Interval is 0.01 years. This is a 8,060% Historic Frequency Chance per

year. The past 10-year Record Frequency Per Year is 46.9, the past 20-year frequency is 70.95, and the past 50-year frequency is 80.6 (see the Hazard Frequency Table in Appendix D).

Since the previous Hazard Mitigation Plan was completed, an estimated 135 wildfire events have occurred, with a total estimated 525 acres burned. There is no record of any homes or buildings being destroyed or damaged by wildfires. However, a multi-day wildfire event in May 2007 scorched several hundred acres of land and presented a danger to residents. Fire fighters took several days to suppress the fire and the event was a strain on local resources. A suspected arson perpetrator was arrested.

Although the most complete available data were used for this analysis, the possibility remains that other events may have occurred in the community that went unreported or underreported.

C./D.: Inventory of Assets Exposed and Potential Loss

In Worksheet 3A: Inventory of Assets (appearing in Appendix A), we estimate that all of Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City are equally vulnerable to this hazard. Because data broken down by jurisdiction are not consistently available, it was not possible to break down these worksheets by jurisdiction; therefore, they refer to the entire county, including the four cities.

An estimated 100% of the Residential property (7,025 of 7,025) in Berrien County (including the Cities of Alapaha, Enigma, Nashville, and Ray City) could be affected by this hazard, with a total value of \$384,937,709. Also, an estimated 100% of the Commercial, Industrial, Agricultural, Religious/Non-Profit, Government, Education and Utility properties (4,204 of 4,204) in the community may be affected, with a total value of \$881,991,556. The values are based on the most recent available tax roll data for Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City provided by the Berrien County Tax Assessor's Office.

Damage to crops is not taken into account in any of these figures. According to the Center for Agribusiness & Economic Development's 2016 Georgia Farm Gate Value Report (http://caes2.caes.uga.edu/center/caed/documents/GAFGVR2016_DEC16.pdf), the total farm gate value of agricultural production in Berrien County is \$119,970,773

According to the inventory database reports and maps, all of the 94 Critical Facilities and Infrastructure for Berrien County (including the Cities of Alapaha, Enigma, Nashville, and Ray City) could be affected by this hazard. The total value of these Critical Facilities is \$187,642,316, plus a content value of \$85,300.

E. Land Use and Development Trends

All jurisdictions except the Town of Alapaha have seen a decrease in population over the last few years. All five jurisdictions have zoning regulations and mandatory building and fire codes which are enforced by a building inspector. All Cities and the County participate in joint comprehensive planning and in the required updates of the Service Delivery Strategy. No other land use or development trends that relate to this hazard have been identified at this time.

F. Multi-Jurisdictional Differences

Wildfires may happen at any place at any time, but are more likely in forested areas. Unincorporated Berrien County is the only jurisdiction that has any areas rated “Very High” for Wildfire Hazard Potential. The impact of a wildfire would be more severe in places with higher population density due to more people being in danger and more potential for destruction of homes and other buildings.

Berrien County has a total area of 452 square miles with a population density of 42.7 people per square mile (US Census data, 2010). As such, certain services, including emergency services, may have large distances to cover when responding to an event, which may negatively influence emergency response times and strain resources. Berrien County contains four incorporated cities: Alapaha, Enigma, Nashville (the county seat), and Ray City.

Each jurisdiction has its own fire department. All fire stations in the community are staffed by volunteers except for Nashville, which has 1 full time paid employee.

The following are the ISO Classes of fire districts in Berrien County and Alapaha, Enigma, Nashville, and Ray City

Station	ISO Class
Berrien County Fire Dept. – East Berrien	Class 9
Berrien County Fire Dept. – New Lois	Class 9
Berrien County Fire Dept. – West Berrien	Class 8B
Alapaha Fire Dept.	Class 6/9
Enigma Fire Dept.	Class 6/9
Nashville Fire Dept.	Class 4
Ray City Fire Dept.	Class 4

G. Overall HRV Summary of Events and Their Impact

Wildfires have the potential to cause damage at any place, at any time, throughout Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. They can spread quickly and residents may not have time to evacuate. The cost of the damage and potential loss of life may be higher if the event strikes populated areas as opposed to more sparsely populated or unpopulated areas.

The HMPUC has developed a comprehensive range of Mitigation Goals, Objectives, and Action Steps to lessen the impacts from this hazard. These are contained in Chapter 4.

Since the previous plan was approved, there have not been any new developments, regulations, programs, or other changes in the community that would either increase or decrease the community’s overall vulnerability to this hazard.

Section VI. Hail

A. Identification of Hazard

The threat of hail has been chosen by the Berrien County HMPUC as the sixth most likely hazard to occur and cause damage in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City, based on past experience, the FEMA-described methodology, and other factors. Historic data have been examined from various sources, including the National Climatic Data Center (see Appendix F), as well as from local history and personal accounts, in order to determine the frequency of events.

Hail is a form of precipitation that occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere, where they freeze into balls of ice. Hail can damage aircraft, homes and cars, and can be deadly to livestock and people. Hail is usually pea-sized to marble-sized, but big thunderstorms can produce big hail.

Hail size is estimated by comparing it to a known object. Most hail storms are made up of a mix of sizes, and only the very largest hail stones pose serious risk to people caught in the open. The following are some common size measurements.

(Source: <http://www.nssl.noaa.gov/education/svrwx101/hail/>):

- Pea = 1/4 inch diameter
- Marble/mothball = 1/2 inch diameter
- Dime/Penny = 3/4 inch diameter
- Nickel = 7/8 inch
- Quarter = 1 inch — hail quarter size or larger is considered severe
- Ping-Pong Ball = 1 1/2 inch
- Golf Ball = 1 3/4 inches
- Tennis Ball = 2 1/2 inches
- Baseball = 2 3/4 inches
- Tea cup = 3 inches
- Grapefruit = 4 inches
- Softball = 4 1/2 inches

B. Profile of Events, Frequency of Occurrences, Probability

According to the NOAA Storm Events Database (see Appendix F), there are 18 reports of Hail events occurring in Berrien County (including the Cities) between 01/01/1950 and 5/31/2018. The Historic Recurrence Interval is 3.78 years. This is a 26.47% Historic Frequency Chance per year. The past 10-year Record Frequency Per Year is 0.6, the past 20-year frequency is 0.45, and the past 50-year frequency is 0.36 (see the Hazard Frequency Table in Appendix D). A notable hail event occurred on June 1, 1997, with large hailstones (reported at up to 1.75 inches in size, or golf ball size) and an estimated \$20,000 in property damage. The most recent event on record involved hail between the size of quarters and golf balls from 2 miles east of Nashville, reported on March 23, 2013. This event did not cause any reported power outages, but did cause damage to the roofs of vehicles.

According to the best data available, since the previous Hazard Mitigation Plan became effective, no hail events have been recorded.

Although the most complete available data were used for this analysis, the possibility remains that other events may have occurred in the community that went unreported or underreported.

C./D.: Inventory of Assets Exposed and Potential Loss

In Worksheet 3A: Inventory of Assets (appearing in Appendix A), we estimate that all of Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City are equally vulnerable to this hazard. Because data broken down by jurisdiction are not consistently available, it was not possible to break down these worksheets by jurisdiction; therefore, they refer to the entire county, including the four cities.

An estimated 100% of the Residential property (7,025 of 7,025) in Berrien County (including the Cities of Alapaha, Enigma, Nashville, and Ray City) could be affected by this hazard, with a total value of \$384,937,709. Also, an estimated 100% of the Commercial, Industrial, Agricultural, Religious/Non-Profit, Government, Education and Utility properties (4,204 of 4,204) in the community may be affected, with a total value of \$881,991,556. The values are based on the most recent available tax roll data for Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City provided by the Berrien County Tax Assessor's Office.

Damage to crops is not taken into account in any of these figures. According to the Center for Agribusiness & Economic Development's 2016 Georgia Farm Gate Value Report (http://caes2.caes.uga.edu/center/caed/documents/GAFGVR2016_DEC16.pdf), the total farm gate value of agricultural production in Berrien County is \$119,970,773

According to the inventory database reports and maps, all of the 94 Critical Facilities and Infrastructure for Berrien County (including the Cities of Alapaha, Enigma, Nashville, and Ray City) could be affected by this hazard. The total value of these Critical Facilities is \$187,642,316, plus a content value of \$85,300.

E. Land Use and Development Trends

All jurisdictions except the Town of Alapaha have seen a decrease in population over the last few years. All five jurisdictions have zoning regulations and mandatory building and fire codes which are enforced by a building inspector. All Cities and the County participate in joint comprehensive planning and in the required updates of the Service Delivery Strategy. No other land use or development trends that relate to this hazard have been identified at this time.

F. Multi-Jurisdictional Differences

Hail events are usually area-wide, and no difference in severity is expected between Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. However, the impact may be more severe in places with higher population density due to more people being in danger,

more people needing to be evacuated, more debris from damaged buildings, and other impacts associated with higher population density.

G. Overall HRV Summary of Events and Their Impact

Hail events can cause damage at any place, at any time, throughout Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City, especially during thunderstorms. The cost of the damage may be higher if the event strikes populated areas as opposed to more sparsely populated or unpopulated areas.

The HMPUC has developed a comprehensive range of Mitigation Goals, Objectives, and Action Steps to lessen the impacts from this hazard. These are contained in Chapter 4.

Since the previous plan was approved, there have not been any new developments, regulations, programs, or other changes in the community that would either increase or decrease the community's overall vulnerability to this hazard.

Section VII. Tornadoes

A. Identification of Hazard

The threat of tornadoes has been chosen by the HMPUC as the seventh most likely hazard to occur and cause damage in the community, based on past experience, the FEMA-described methodology, and other factors. Historic data have been examined from various sources, including the National Climatic Data Center (see Appendix F), as well as from local history and personal accounts, in order to determine the frequency of events. **For further information, see the HAZUS Report in Appendix G [pending].**

A tornado is defined by NOAA (<http://www.nssl.noaa.gov/education/svrwx101/tornadoes/>) as a narrow, violently rotating column of air that extends from the base of a thunderstorm to the ground. Because wind is invisible, it is hard to see a tornado unless it forms a condensation funnel made up of water droplets, dust and debris. Tornadoes are the most violent of all atmospheric storms.

About 1,200 tornadoes hit the U.S. yearly. A tornado watch is issued when weather conditions are favorable for tornadoes. During a tornado watch, residents are advised to watch and prepare for severe weather and stay tuned to NOAA Weather Radio to know when warnings are issued. A tornado warning is issued when a tornado has been reported by spotters or indicated by radar and there is a serious threat to life and property to those in the path of the tornado. When a tornado warning is issued, residents must act immediately to find safe shelter. A warning can cover parts of counties or several counties in the path of danger.

The Enhanced Fujita Scale, implemented by the National Weather Service in 2007, is used to assign a tornado a rating based on estimated wind speeds and related damage. The wind speeds associated with the EF ratings are shown in the table below. Because of the difficulty of measuring wind speeds inside a tornado, wind speeds are estimated based on the type of damage that occurs; more information is available on the NOAA website at <http://www.spc.noaa.gov/faq/tornado/ef-scale.html>.

ENHANCED FUJITA WIND DAMAGE SCALE

(Source: <http://www.spc.noaa.gov/faq/tornado/ef-scale.html>)

EF Number	3-Second Gust	Damage
EF-0	65 to 85 mph	Light damage. Some damage chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
EF-1	86 to 110 mph	Moderate Damage. The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
EF-2	111 to 135 mph	Significant Damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; high rise windows broken and blown in; light-object missiles generated.

EF-3	136 to 165 mph	Severe Damage. Roofs and walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
EF-4	166 to 200 mph	Devastating, damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
EF-5	Over 200 mph	Incredible, damage. Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 m (109 yards); trees debarked; steel reinforced concrete structures badly damaged.

Tornadoes may occur at any time of year, although the peak “tornado season” for the Southern Plains is during May into early June. Tornadoes can occur due to inclement weather conditions, as a result of a passing front, or as part of thunderstorm or hurricane/tropical storm events.

Tornadoes can occur at any time of the day or night, but according to NOAA

(<http://www.nssl.noaa.gov/education/svrwx101/tornadoes/>), most tornadoes occur between 4:00 and 9:00 p.m. The path and severity of a tornado cannot be determined in advance. The best defense is to heed tornado warnings and seek appropriate shelter when a tornado has been sighted in the area or when conditions conducive to a tornado are present.

Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City are all vulnerable to the effects of tornadoes. According to NOAA (<https://www.ncdc.noaa.gov/climate-information/extreme-events/us-tornado-climatology>), an average of 30 tornadoes occur per month in Georgia.

B. Profile of Events, Frequency of Occurrences, Probability

According to the NOAA Storm Events Database (see Appendix F), there 11 reports of tornadoes occurring in Berrien County (including the Cities) between 01/01/1950 and 5/31/2018. The Historic Recurrence Interval is 6.18 years. This is a 16.18% Historic Frequency Chance per year. The past 10-year Record Frequency Per Year is 0.1, the past 20-year frequency is 0.05, and the past 50-year frequency is 0.22 (see the Hazard Frequency Table in Appendix D).

Since the previous Hazard Mitigation Plan was completed, one tornado event has occurred, resulting in two fatalities. This event occurred in the early hours of Sunday, January 22, 2017. An EF3 tornado from northeast Brooks and Cook counties progressed into Berrien County, where it completely removed the second story of a wood frame home on South Coffee Road. Just up the road, a well-strapped double wide home was completely removed and tossed into nearby trees and hedges. The last of the EF3 damage occurred on Old Lois Road where most of the roof of a brick home was removed. An add-on room on the back of the home was flattened by a massive live oak tree, crushing two occupants to death in their bed. The track length of this tornado has been estimated at 20 miles and the width at ½ mile. This event also caused widespread power outages.

Although the most complete available data were used for this analysis, the possibility remains that other events may have occurred in the community that went unreported or underreported.

C./D.: Inventory of Assets Exposed and Potential Loss

In Worksheet 3A: Inventory of Assets (appearing in Appendix A), we estimate that all of Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City are equally vulnerable to this hazard. Because data broken down by jurisdiction are not consistently available, it was not possible to break down these worksheets by jurisdiction; therefore, they refer to the entire county, including the four cities.

An estimated 100% of the Residential property (7,025 of 7,025) in Berrien County (including the Cities of Alapaha, Enigma, Nashville, and Ray City) could be affected by this hazard, with a total value of \$384,937,709. Also, an estimated 100% of the Commercial, Industrial, and Agricultural, Religious/Non A Profit, Government, Education and Utility properties (4,204 of 4,204) in the community may be affected, with a total value of \$881,991,556. The values are based on the most recent available tax roll data for Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City provided by the Berrien County Tax Assessor's Office.

Damage to crops is not taken into account in any of these figures. According to the Center for Agribusiness & Economic Development's 2016 Georgia Farm Gate Value Report (http://caes2.caes.uga.edu/center/caed/documents/GAFGVR2016_DEC16.pdf), the total farm gate value of agricultural production in Berrien County is \$119,970,773

According to the inventory database reports and maps, all of the 94 Critical Facilities and Infrastructure for Berrien County (including the Cities of Alapaha, Enigma, Nashville, and Ray City) could be affected by this hazard. The total value of these Critical Facilities is \$187,642,316, plus a content value of \$85,300.

E. Land Use and Development Trends

Typically, mobile/manufactured homes are most vulnerable to tornado damage. According to 2016 Census Bureau estimates, 32.9% of occupied housing units in Berrien County (including the Cities) are mobile homes (2,339 mobile homes and approximately 6619 people based on the average household size of 2.83 persons per household in the County). In the Town of Alapaha 32.3% of occupied housing units are mobile homes (83 mobile homes and approximately 234 people). In the Town of Enigma, 60.2% of occupied housing units are mobile homes (215 mobile homes and approximately 608 people). In the City of Nashville, 16.7% of occupied housing units are mobile homes (329 mobile homes and approximately 931 people). In the City of Ray City, 24.0% of occupied housing units are mobile homes (105 mobile homes and approximately 297 people).

All jurisdictions except the Town of Alapaha have seen a decrease in population over the last few years. All five jurisdictions have zoning regulations and mandatory building and fire codes which are enforced by a building inspector. All Cities and the County participate in joint comprehensive planning and in the required updates of the Service Delivery Strategy. No other land use or development trends that relate to this hazard have been identified at this time.

F. Multi-Jurisdictional Differences

Tornadoes tend to follow a straight path regardless of natural features or political boundaries, and no difference in severity is expected between Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. However, the impact may be more severe in places with higher population density due to more people being in danger, more people needing to be evacuated, more debris from damaged buildings, and other impacts associated with higher population density. In jurisdictions without building codes and inspections, structures may exist that are not built to code and therefore may be especially vulnerable to the effects of strong winds and other hazards. In jurisdictions with a large number of mobile homes, the damage can be expected to be more severe.

G. Overall HRV Summary of Events and Their Impact

Tornadoes have the potential to cause damage at any place, at any time, throughout Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. They can form quickly and residents may not have time to find adequate shelter, or else adequate shelter facilities may not be available. The cost of the damage and potential loss of life may be higher if the event strikes populated areas as opposed to more sparsely populated or unpopulated areas, or if the event strikes areas with a large number of mobile homes.

The HMPUC has developed a comprehensive range of Mitigation Goals, Objectives, and Action Steps to lessen the impacts from this hazard. These are contained in Chapter 4.

Since the previous plan was approved, there have not been any new developments, regulations, programs, or other changes in the community that would either increase or decrease the community's overall vulnerability to this hazard.

Section VIII. Severe Winter Storms

A. Identification of Hazard

A severe winter storm is an event in which varieties of precipitation are formed that only occur at low temperatures, such as snow or sleet, or a rainstorm where ground temperatures are low enough to allow ice to form (i.e. freezing rain). Associated outcomes may include ice on roads, snow accumulation, frost on surfaces, and cold temperatures to which local residents are unaccustomed. The threat of Severe Winter Storms has been chosen by the Berrien County HMPUC as the eighth most likely hazard to occur and cause damage in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City, based on past experience, the FEMA-described methodology, and other factors. Historic data have been examined from various sources, including the National Climatic Data Center (see Appendix F), as well as from local history and personal accounts, in order to determine the frequency of events.

Although this natural hazard did not rank high in any dataset of occurrences or damages happening in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City, undocumented personal accounts of the HMPUC members rated this hazard as likely to occur and cause damage. Because of the infrequency of severe winter storms in this region, residents of the community are not well prepared to handle such events. Icy roads may result in a disproportionate number of automobile crashes because residents are not accustomed to driving in icy conditions. Bridges and overpasses may be more susceptible to icing over, creating an additional hazard. Being unprepared may result in loss of life or substantial damage to property and the economy.

Severe winter storms, at the worst, will produce sleet, freezing rain, and/or 1 to 2 inches of snow, with temperatures as low as the teens (°F). Snow accumulation usually melts away within 24 hours. Possible damage that may occur includes downed tree limbs, impassable roadways, power outages, increased emergency service workloads, failed water/sewer/septic systems, crop damage, and vehicle crashes.

B. Profile of Events, Frequency of Occurrences, Probability

According to the NOAA Storm Events Database (see Appendix F), there have been 3 Severe Winter Storm event reported in Berrien County (including the Cities) between 01/01/1950 and 5/31/2018. The Historic Recurrence Interval is 22.67 years. This is a 4.41% Historic Frequency Chance per year. The past 10-year Record Frequency Per Year is 0.1, the past 20-year frequency is 0.15, and the past 50-year frequency is 0.06 (see the Hazard Frequency Table in Appendix D).

Since the previous Hazard Mitigation Plan became effective, two Severe Winter Storm events have been reported. One event, on March 16, 2017, caused an estimated \$204 million in blueberry crop losses throughout Georgia; some of these losses affected Berrien County since blueberries are one of the community's significant crops. Another winter storm, on January 3, 2018, brought up to 1 inch of snow to the area along with some ice on roads causing car crashes, impassable roads due to ice, as well as widespread frost and extremely low temperatures for the area.

Although the most complete available data were used for this analysis, the possibility remains that other events may have occurred in the community that went unreported or underreported.

C./D.: Inventory of Assets Exposed and Potential Loss

In Worksheet 3A: Inventory of Assets (appearing in Appendix A), we estimate that all of Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City are equally vulnerable to this hazard. Because data broken down by jurisdiction are not consistently available, it was not possible to break down these worksheets by jurisdiction; therefore, they refer to the entire county, including the four cities.

An estimated 100% of the Residential property (7,025 of 7,025) in Berrien County (including the Cities of Alapaha, Enigma, Nashville, and Ray City) could be affected by this hazard, with a total value of \$384,937,709. Also, an estimated 100% of the Commercial, Industrial, Agricultural, Religious/Non-Profit, Government, Education and Utility properties (4,204 of 4,204) in the community may be affected, with a total value of \$881,991,556. The values are based on the most recent available tax roll data for Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City provided by the Berrien County Tax Assessor's Office.

Damage to crops is not taken into account in any of these figures. According to the Center for Agribusiness & Economic Development's 2016 Georgia Farm Gate Value Report (http://caes2.caes.uga.edu/center/caed/documents/GAFGVR2016_DEC16.pdf), the total farm gate value of agricultural production in Berrien County is \$119,970,773

According to the inventory database reports and maps, all of the 94 Critical Facilities and Infrastructure for Berrien County (including the Cities of Alapaha, Enigma, Nashville, and Ray City) could be affected by this hazard. The total value of these Critical Facilities is \$187,642,316, plus a content value of \$85,300.

E. Land Use and Development Trends

All jurisdictions except the Town of Alapaha have seen a decrease in population over the last few years. All five jurisdictions have zoning regulations and mandatory building and fire codes which are enforced by a building inspector. All Cities and the County participate in joint comprehensive planning and in the required updates of the Service Delivery Strategy. No other land use or development trends that relate to this hazard have been identified at this time.

F. Multi-Jurisdictional Differences

Severe Winter Storm events are usually area-wide, and no difference in severity is expected between Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. In the event of icy roads, hazards would be greater along high-traffic corridors and in more densely populated areas. In the event of a power failure, households for which electricity is the only available source of heat will be more vulnerable to low temperatures. Homeless people are one of the groups that are most vulnerable to the effects of severe winter storms. Agriculture is a significant part of the economy of unincorporated Berrien County, and many crops may be affected by severe winter weather.

G. Overall HRV Summary of Events and Their Impact

Severe winter storms have the potential to cause damage at any place, at any time during the winter months, throughout Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. The cost of the damage may be higher in terms of vehicle crashes along high-traffic corridors and in more densely populated areas, and higher in terms of crop damage in the agricultural areas of the county.

The Berrien County HMPUC recognizes severe winter storms as the eighth most likely natural hazard to occur and cause damage. They have developed a comprehensive range of Mitigation Goals, Objectives, and Action Steps to lessen severe winter storm impacts on Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. These are contained in Chapter 4.

Since the previous plan was approved, there have not been any new developments, regulations, or programs that would either increase or decrease the community's overall vulnerability to this hazard.

Chapter 3: **Local Technological Hazard, Risk,** **and Vulnerability (HRV) Summary**

Section I. Hazardous Materials Release

A. Identification of Hazard

Hazardous materials are substances or materials that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety, and property when transported in commerce. When these materials are released they become dangerous. A release may occur by spilling, leaking, emitting toxic vapors, or any other process that enables the material to escape its container, enter the environment, and create a potential hazard.

The effects of hazardous material releases can occur very rapidly with little or no advance warning, in the form of explosions, fires, and immediate health impacts. Slower effects can include long-term environmental damage and long-term health problems resulting from exposure.

B. Profile of Events, Frequency of Occurrences, Probability

Hazardous material spills are common in areas where hazardous materials are fabricated, processed, and stored. Transportation of hazardous materials by truck is the cause of the greatest number of hazardous materials events. Many products containing hazardous chemicals are routinely used and stored in homes. These products are also shipped daily on the nation's highways, railroads, waterways, and in pipelines. In most cases, disasters involving hazardous materials are confined to a localized area, whether an accidental release occurs at a fixed facility or in association with a transportation incident. The United States Environmental Protection Agency categorizes wastes according to four characteristics: Ignitability, corrosivity, reactivity, and toxicity. Furthermore, the EPA categorizes hazardous wastes according to the following hazard codes (source: <https://www.epa.gov/hw/defining-hazardous-waste-listed-characteristic-and-mixed-radiological-wastes>):

- (T) - Toxic Waste
- (H) - Acute Hazardous Waste
- (I) - Ignitable Waste
- (C) - Corrosive Waste
- (R) - Reactive Waste
- (E) - Toxicity Characteristic Waste

The extent or severity of a hazardous materials release within the community is not predictable due to the varied nature of hazardous materials and the widespread area covered by the transportation network upon which such materials may be transported.

One source of concern to the community is the possibility of natural gas pipeline leakage, spills, or related incidents. Natural gas pipelines are present in the community. Nationally, from 1998 to

2017, 807 serious pipeline incidents were reported by the US Department of Transportation, causing a total of 306 fatalities. This includes 20 incidents that occurred in Georgia, with 6 fatalities. No incidents have been reported in Berrien County.

(Source: <https://hip.phmsa.dot.gov/analyticsSOAP/saw.dll?Portalpages>).

Not all hazardous materials releases are transportation-related. One specific type of hazardous materials release that has been a source of concern in the community is the potential for illegal methamphetamine labs to explode. In these illicit operations, meth “cooks” produce the drug by isolating ingredients from cold medicine and combining them with a variety of hazardous substances, including drain cleaner, battery acid, and antifreeze (source: <https://drugabuse.com/featured/10-years-of-meth-lab-explosions/>). Explosion events from these labs release corrosive chemicals and can cause those exposed to suffer burn injuries, inhalational injuries, and death (source: <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6433a4.htm>). In 2014, 24 meth lab incidents (including labs, "dumpsites," and "chemical and glassware" seizures) were reported in Georgia, down from 66 in 2013 (source: <https://www.dea.gov/resource-center/meth-lab-maps.shtml>).

According to the USDOT Pipeline and Hazardous Materials Safety Administration’s Office of Hazardous Materials Safety database (see Appendix F), there are 4 reports of Hazardous Materials Release events occurring in Berrien County (including the Cities) between 01/01/1978 and 05/31/2018. The Historic Recurrence Interval is 7.5 years. This is a 13.33% Historic Frequency Chance per year. The past 10-year Record Frequency Per Year is 0.1, the past 20-year frequency is 0.1, and the past 50-year frequency is 0.08 (see the Hazard Frequency Table in Appendix D). Most recently, on Sept. 29, 2009, a truck carrying batteries caught fire in the City of Nashville, with total damage estimated at \$73,182.

No hazardous materials release events have been recorded since the previous Hazard Mitigation Plan was completed. Although the most complete available data were used for this analysis, the possibility remains that other events may have occurred in the community that went unreported or underreported.

C./D.: Inventory of Assets Exposed and Potential Loss

An estimated 100% of the Residential property (7,025 of 7,025) in Berrien County (including the Cities of Alapaha, Enigma, Nashville, and Ray City) could be affected by this hazard, with a total value of \$384,937,709. Also, an estimated 100% of the Commercial, Industrial, Agricultural, Religious/Non-Profit, Government, Education and Utility properties (4,204 of 4,204) in the community may be affected, with a total value of \$881,991,556. The values are based on the most recent available tax roll data for Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City provided by the Berrien County Tax Assessor’s Office.

Damage to crops is not taken into account in any of these figures. According to the Center for Agribusiness & Economic Development’s 2016 Georgia Farm Gate Value Report (http://caes2.caes.uga.edu/center/caed/documents/GAFGVR2016_DEC16.pdf), the total farm gate value of agricultural production in Berrien County is \$119,970,773

According to the inventory database reports and maps, all of the 94 Critical Facilities and Infrastructure for Berrien County (including the Cities of Alapaha, Enigma, Nashville, and Ray City) could be affected by this hazard. The total value of these Critical Facilities is \$187,642,316, plus a content value of \$85,300.

E. Land Use and Development Trends

All jurisdictions except the Town of Alapaha have seen a decrease in population over the last few years. All five jurisdictions have zoning regulations and mandatory building and fire codes which are enforced by a building inspector. All Cities and the County participate in joint comprehensive planning and in the required updates of the Service Delivery Strategy. No other land use or development trends that relate to this hazard have been identified at this time.

F. Multi-Jurisdictional Differences

The facilities most vulnerable to a hazardous materials release are those located within a one-mile buffer of the major highways and railways in the community.

U.S. highways carrying truck traffic pass through all the jurisdictions. A short line railroad operated by CaterParrott Railnet runs through Ray City and Nashville, terminating in the nearby City of Willacoochee.

G. Overall HRV Summary of Events and Their Impact

A significant portion of the community could be vulnerable to a hazardous materials release. Preparation for such an event requires specific training for first responders and coordination among agencies to ensure a swift response and containment of hazardous materials in order to minimize the potential loss of life and property. Therefore, a key priority should be to train responders to fulfill their responsibilities and conduct periodic tests to be sure the response plan is realistic and responders are ready to carry it out.

Human error is the probable cause of most transportation incidents and associated consequences involving the accidental release of hazardous materials. Varying quantities of hazardous materials are manufactured, used, or stored in Berrien County. Due to the county's location on or near several major transportation routes, the potential exists for a catastrophic hazardous material release event due to a transportation accident.

Since the previous plan was approved, there have not been any new developments, regulations, programs, or other changes in the community that would either increase or decrease the community's overall vulnerability to this hazard.

Chapter 4: Local Natural Hazard Mitigation Goals and Objectives

Summary of Changes:

Table 4.1 provides a brief description of each section in this chapter and a summary of the changes that have been made.

Chapter 4 Section	Updates to Section
I. Flood	Updated Goals, Objectives, and Action Step Formatting, Numbering and Data Fields, Updated or Deleted Prior Action Steps and Added New Action Steps (if applicable)
II. Thunderstorm/Wind	Updated Goals, Objectives, and Action Step Formatting, Numbering and Data Fields, Updated or Deleted Prior Action Steps and Added New Action Steps (if applicable)
III. Hurricane/Tropical Storm	Updated Goals, Objectives, and Action Step Formatting, Numbering and Data Fields, Updated or Deleted Prior Action Steps and Added New Action Steps (if applicable)
IV. Drought	Updated Goals, Objectives, and Action Step Formatting, Numbering and Data Fields, Updated or Deleted Prior Action Steps and Added New Action Steps (if applicable)
V. Wildfire	Updated Goals, Objectives, and Action Step Formatting, Numbering and Data Fields, Updated or Deleted Prior Action Steps and Added New Action Steps (if applicable)
VI. Hail	Updated Goals, Objectives, and Action Step Formatting, Numbering and Data Fields, Updated or Deleted Prior Action Steps and Added New Action Steps (if applicable)
VII. Tornado	Updated Goals, Objectives, and Action Step Formatting, Numbering and Data Fields, Updated or Deleted Prior Action Steps and Added New Action Steps (if applicable)
VIII. Severe Winter Storm	Updated Goals, Objectives, and Action Step Formatting, Numbering and Data Fields, Updated or Deleted Prior Action Steps and Added New Action Steps (if applicable)

Table 4.1: Overview of updates to Chapter 4: Local Natural Hazards, Mitigation Goals and Objectives

Overall Community Mitigation Goals, Policies, and Values Narrative

This plan, as a joint effort between Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City, will serve as a comprehensive mitigation plan. The mitigation strategies, hazard identification, and other information identified in this plan will be integrated into all comprehensive City and County plans in the future. Incorporation of these strategies will occur, as necessary, throughout this planning cycle covered by this Hazard Mitigation Plan Update. In particular, aspects of this plan will be integrated into the Berrien County Comprehensive Plan during the next planning cycle. The incorporation methodology for all jurisdictions is to include aspects of the hazard mitigation plan in all relevant plans (especially the comprehensive plan) during those plans' regular planning cycle. There is no difference in incorporation methodology between any of the jurisdictions.

Identified hazards and mitigation strategies of the previous Berrien County Hazard Mitigation plan were integrated into the Local Emergency Operations Plan, multiple County and City SOPs and SOGs, and future planning and zoning plans. For the development of this plan, the current Berrien County Comprehensive Plan and Community Wildfire Protection Plan were reviewed. Berrien County will integrate mitigation strategies identified in this plan into future updates of the Berrien County Comprehensive Plan, Community Wildfire Protection Plan, Continuity of Operations Plan (when applicable), and other future plans. Strategies identified in the previous plan were applied to grant applications, building and zoning requirements, and development planning considerations for Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. The same is true for the current plan update. Many of these strategies will be applied using previously identified policies and ordinances. All jurisdictions have the authority to adopt locally binding ordinances and policies to enhance the mitigation strategies in their jurisdiction.

The Legal and Regulatory Capability Survey (below) describes the authorities available to the jurisdictions and/or enabling legislation at the state level affecting planning and land management tools that support local hazard mitigation planning efforts. The identified planning and land management tools are typically used by states and local jurisdictions to implement hazard mitigation activities.

Regulatory Tools/Plans	Regulatory Type: Ordinance, Resolution, Codes, Plans, Etc.	Local Authority	State Prohibited	Higher Authority
Building Codes	County/Municipal Code	Yes	No	No
Capital Improvements Plan	Berrien County and Cities of Alapaha, Enigma, Nashville, and Ray City Comprehensive Plan	Yes	No	No
Comprehensive Plan	Berrien County and Cities of Alapaha, Enigma, Nashville, and Ray City Comprehensive Plan	Yes	No	No
Economic Development Plan	Berrien County and Cities of Alapaha, Enigma, Nashville, and Ray City Comprehensive Plan	Yes	No	Yes
Emergency Response Plan	Berrien County Local Emergency Operations Plan (LEOP)	Yes	No	Yes

Zoning Ordinances	Berrien County Land Development Ordinance Ray City Zoning Ordinance	Yes	No	No
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The City of Alapaha offers many administrative and technical services to the community. City departments include: Administrative, Public Works, Water and Sewer, Garbage, Licensing and Permits, Police Department, and Fire Department.

The City of Enigma offers many administrative and technical services to the community. City departments include: Administrative, Public Works, Water, Garbage, Licensing and Permits, Police Department, and Fire Department.

The City of Nashville offers many administrative and technical services to the community. City departments include: Administrative, Public Works, Water and Sewer, Garbage, Licensing and Permits, Police Department, and Fire Department.

The City of Ray City offers many administrative and technical services to the community. City departments include: Administrative, Public Works, Water and Sewer, Garbage, Licensing and Permits, Police Department, and Fire Department.

Opportunities to integrate the requirements of this Plan into other local planning mechanisms shall continue to be identified. Although it is recognized that there are many possible benefits to integrating components of this Plan into other local planning mechanisms, the development and maintenance of this stand-alone Hazard Mitigation Plan is deemed by the Berrien County Hazard Mitigation Planning Committee to be the most effective and appropriate method to implement local hazard mitigation actions at this time.

While Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City each operate autonomously, there is a high level of cooperation exhibited when it comes to hazard mitigation and emergency planning efforts. Each local government has designated representatives to participate in the emergency management process, whether it be during planning, response, or recovery phases. The local Emergency Management Agency hosts regular meetings to gather all of the relevant local, regional and state partners together to develop effective plans and strengthen relationships among all of the stakeholders. Working together, the jurisdictions have been able to access resources available through several state and federal sources that have been instrumental in improving the technical capabilities of these communities to more effectively mitigate hazards and provide more accurate warning and preparatory information to their citizens.

Overall, the priorities for each of the local communities have remained relatively unchanged. The hazards and risks associated with each have not changed, and many of the action steps identified during previous Hazard Mitigation Plans are still relevant and remain a priority in this plan as well.

Authority for the development of this Plan was given by the Berrien County Commission as a result of their execution of the Grantee-Subgrantee Agreement for the Berrien County Hazard Mitigation Grant Program (HMGP) Planning Project; and by the Cities of Alapaha, Enigma,

Nashville, and Ray City located in Berrien County, through their participation in the planning project. The Berrien County Emergency Management Agency is authorized to oversee emergency management within Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City.

The jurisdictions have many current policies and programs related to hazard mitigation, which are described in detail in the goals, objectives, and action steps contained in Chapter 4 of this Plan. All jurisdictions (within the boundaries of their budgets) have the ability to expand and improve their existing policies and programs as evidenced by the new and existing goals, objectives, and action steps included in this plan. The amount of resources available to the jurisdictions for expansion and improvement of existing programs will depend on factors such as the local government budgets and the availability of state and federal funding to support hazard mitigation activities.

This chapter contains a description of the comprehensive range of Mitigation Goals, Objectives, and Action Steps that were developed by the HMPUC to reduce damages and improve safety through Hazard Mitigation. These have been arranged by the natural hazards contained in Chapter 2. There is particular emphasis on emergency preparedness and infrastructure.

The HMPUC discussed and identified the comprehensive range of Mitigation Goals, Objectives, and Action Steps contained in Chapter 4 of this Plan after identifying the hazards noted in Chapter 2 of this Plan. All areas of the community were taken into account in the development of the comprehensive range of Mitigation Goals, Objectives, and Action Steps. These were identified after the weighing of many factors discovered during the planning process, including risk assessment, storm history, past damage, community resources, and other factors.

A list of the comprehensive range of Mitigation Goals, Objectives, and Action Steps was compiled from the input of the HMPUC, as well as from others within the community. Members of the HMPUC prioritized the identified comprehensive range of Mitigation Goals, Objectives, and Action Steps based on what was anticipated to be most beneficial to the community. The benefits of all action steps were determined to be greater than the costs involved.

Several criteria were established to assist the HMPUC members in the prioritization of these suggested Mitigation Goals, Objectives, and Action Steps. Criteria included perceived cost vs. benefit or cost effectiveness, availability of potential funding sources, overall feasibility, measurable milestones, political support for the proposed actions, and the STAPLEE criteria.

Through this prioritization process, several projects emerged as having higher priority than others. However, no priorities have changed since the previous plan was approved. Some of the projects involved expending considerable amounts of funds to initiate the required actions. The determination of the cost/benefit analysis (such as the FEMA B/CA model) of a project will be implemented at the time of project application or funding request. Other projects allowed the communities to pursue completion of the project using potential grant funding. Still others required no significant financial commitment by the communities.

In Chapter 6, Sections I-III, there is a description of the planning process involved in selecting the comprehensive range of Mitigation Goals, Objectives, and Action Steps. The Action Steps

are given a rating of High, Medium, or Low Priority by the HMPUC based on a number of factors (with a primary emphasis on prioritized cost versus benefit review) identified in Chapter 6, Section I.

Relevant comprehensive ranges of Mitigation Goals, Objectives, and Action Steps are listed below throughout the chapter. The Berrien County EMA Director has been chosen by Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City to oversee the projects. The Berrien County EMA has been designated by Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City to be the coordinating agency for implementation and administration of these projects.

Section I. Floods

A. Community Mitigation Goals

As previously indicated in Chapter 2, this hazard may cause substantial damage to life, property, and the economy in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. Floods are unpredictable and can happen at any place and at any time. Because of the damage and loss of life it may cause, the HMPUC believes that the comprehensive range of Mitigation Goals, Objectives, and Action Steps (contained in Section C below) should be implemented to reduce this hazard's potential impact on the community.

B. Identification and Analysis of the Comprehensive Range of Mitigation Options

1. Structural and Non-Structural Mitigation:

This Hazard Mitigation Plan contains both structural and non-structural options. For more information, see the comprehensive range of Mitigation Goals, Objectives, and Action Steps contained in Section C below.

2. Existing Policies, Regulations, Ordinances and Land Use:

Chapter 2 of this plan contains information regarding existing policies, regulations, ordinances, and land use that are relevant to this hazard. For more information, see Chapter 2, Subsection E of each Section.

3. Community Values, Historic and Special Considerations:

Historic buildings exist in the community, a few of which are Critical Facilities. There are historic and special considerations that pose significant challenges with regard to the retrofitting of historic buildings in order to make them more resilient to natural hazards. The Town of Alapaha has one building listed in the National Register of Historic Places and Berrien County has three.

4. New Buildings and Infrastructure:

The mitigation strategy and recommendations that follow include action steps designed to protect new buildings and infrastructure from the effects of this hazard.

5. Existing Buildings and Infrastructure:

The mitigation strategy and recommendations that follow include action steps designed to protect existing buildings and infrastructure from the effects of this hazard.

C. Mitigation Strategy and Recommendations:

Goal 1: Prevent or reduce damage (especially to Critical Facilities and Infrastructure) caused by Floods in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City.

Objective 1.1: Minimize losses to existing and future structures, especially critical facilities and infrastructure, due to floods.

Activity #1.1.1	Conduct studies & implement projects of ways to protect the Critical Facilities located in flood prone areas from Flood damages in the City of Nashville.
Priority Level	High Priority
Responsible Agency/Jurisdiction/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$500,000,00 each project
Funding Source(s)	General Funds ² /HUD CDBG (Department of Housing and Urban Development Community Development Block Grants)
Savings/Benefit Estimate	\$24,067,000 (replacement cost for 4 critical facilities)
Status	Ongoing

Activity #1.1.2	Conduct storm-water drainage replacement, repair & cleaning and maintain canals in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City.
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/City of Nashville/City of Ray City Public Works Dept.
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$500,000,00 each project
Funding Source(s)	General Funds/HUD CDBG
Savings/Benefit Estimate	\$575,000.00 per occurrence
Status	Ongoing

Activity #1.1.3	Plan flood and drainage projects in Berrien County in high risk areas and in areas lacking curb & gutter.
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County Public Works Dept. / Unincorporated Berrien County
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$500,000.00 each
Funding Source(s)	General Funds/GEMA/FEMA/HUD CDBG
Savings/Benefit Estimate	\$575,000.00 per occurrence
Status	Ongoing

² “General Funds” refers to the funds that are available to a local government that are not reported under any other fund and have not been designated for a specific purpose.

Activity #1.1.4	Plan flood and drainage projects in the Town of Alapaha in high risk areas and in areas lacking curb & gutter.
Priority Level	High Priority
Responsible Agency/Jurisdiction	Town of Alapaha Public Works Dept.
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$500,000.00 each
Funding Source(s)	General Funds/GEMA/FEMA/HUD CDBG
Savings/Benefit Estimate	\$575,000.00 per occurrence
Status	Ongoing

Activity #1.1.5	Plan flood and drainage projects in the Town of Enigma in high risk areas and in areas lacking curb & gutter.
Priority Level	High Priority
Responsible Agency/Jurisdiction	Town of Enigma Public Works Dept.
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$500,000.00 each
Funding Source(s)	General Funds/GEMA/FEMA/HUD CDBG
Savings/Benefit Estimate	\$575,000.00 per occurrence
Status	Ongoing

Activity #1.1.6	Plan flood and drainage projects in the City of Nashville on West Washington Ave., and in other high risk areas and areas lacking curb & gutter.
Priority Level	High Priority
Responsible Agency/Jurisdiction	City of Nashville Public Works Dept.
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$500,000.00 each
Funding Source(s)	General Funds/GEMA/FEMA/HUD CDBG
Savings/Benefit Estimate	\$575,000.00 per occurrence
Status	Ongoing (New School Circle and Newsome Dr. were completed

Activity #1.1.7	Plan flood and drainage projects in the City of Ray City on South Pauline Street, Johnson Street, North Street, North Street Ext., Miller Street, South Park Street, South Camon Drive, Beaver Dam Road, Hwy. #125 South, and in other high risk areas and areas lacking curb & gutter.
Priority Level	High Priority
Responsible Agency/Jurisdiction	City of Ray City Public Works Dept.
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$500,000.00 each
Funding Source(s)	General Funds/GEMA/FEMA/HUD CDBG
Savings/Benefit Estimate	\$575,000.00 per occurrence
Status	Ongoing

Activity #1.1.8	The Town of Enigma will join the National Flood Insurance Program as soon as possible.
Priority Level	High Priority
Responsible Agency/Jurisdiction	Town of Enigma
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds
Savings/Benefit Estimate	\$575,000.00 per occurrence
Status	Ongoing

Activity #1.1.10	Attempt to take precautions at water facilities in unincorporated Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City to ensure flood protection, as funds become available to do so.
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/ Town of Enigma/City of Nashville/City of Ray City Public Works Dept.
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$500,000.00 each project
Funding Source(s)	General Funds/GEMA/FEMA/HUD CDBG
Savings/Benefit Estimate	\$575,000.00 per occurrence
Status	Ongoing

Activity #1.1.12	Work to alleviate evacuation & emergency access problems in various subdivisions and in other areas in Berrien County and the Town of Alapaha and the Cities of Enigma, Nashville and Ray City
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/City of Nashville/City of Ray City Road Dept.
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$500,000.00 each project
Funding Source(s)	General Fund/GEMA/FEMA/HUD CDBG/GDOT
Savings/Benefit Estimate	\$575,000.00 per occurrence
Status	Ongoing

Activity #1.1.13	Attempt to take precautions at the oxidation pond (subject to flooding by Beaver Dam Creek and Cat Creek) in Ray City and at the oxidation pond in Alapaha as funds become available to do so.
Priority Level	High Priority
Responsible Agency/Jurisdiction	Town of Alapaha and City of Ray City Public Works Dept.
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$500,000.00 each project
Funding Source(s)	General Funds/GEMA/FEMA/HUD CDBG
Savings/Benefit Estimate	\$575,000.00 per occurrence
Status	Ongoing

Activity #1.1.14	After flood events, or other hazard events in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City, attempt to perform analysis on properties affected to determine if events have occurred in the past and attempt to mitigate or purchase, if necessary.
Priority Level	Med. Priority
Responsible Agency/Jurisdiction	Berrien County EMA / County and all Cities
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time & \$500,000.00 per project
Funding Source(s)	General Funds/GEMA/FEMA
Savings/Benefit Estimate	\$575,000.00 per occurrence
Status	Ongoing

D. Special Multi-Jurisdictional Strategy and Considerations:

Most of the strategies outlined above apply to and are intended to be carried out by each of the local jurisdictions. In certain cases, where the action step may not apply to all jurisdictions, the applicable jurisdictions are noted in the table.

E. Local Public Information and Awareness Strategy.

All sections of the Plan shall be monitored and evaluated annually by the County Emergency Management Agency. Incremental accomplishments of Mitigation Goals, Objectives, and Action Steps will be reported to the public through appropriate means (news media, social media, web pages, City Council and County Commission meetings, etc.). By utilizing available resources, each jurisdiction will keep the public constantly informed of the development of these strategies and of how citizens can best assist with and/or take advantage of these efforts.

The major criteria to measure plan success will be the number of Goals, Objectives, and Action Steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property. For further details on plan execution, see Chapter 6.

F. Changes from the Previous Plan

Completed Action Steps

- 1.1.9: Work with FEMA to update local FIRM maps in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City

Deleted Action Steps

(none)

Action Steps Considered But Ultimately Not Added

(none)

Section II. Thunderstorms and Wind

A. Community Mitigation Goals

As previously indicated in Chapter 2, this hazard may cause substantial damage to life, property, and the economy in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. Thunderstorms and wind are unpredictable and can happen at any place and at any time. Because these storms may be extremely violent and cause great damage, the HMPUC believes that the comprehensive range of Mitigation Goals, Objectives, and Action Steps (contained in Section C below) should be implemented to reduce this hazard's potential impact on the community.

B. Identification and Analysis of the Comprehensive Range of Mitigation Options

1. Structural and Non-Structural Mitigation:

This Hazard Mitigation Plan contains both structural and non-structural options. For more information, see the comprehensive range of Mitigation Goals, Objectives, and Action Steps contained in Section C below.

2. Existing Policies, Regulations, Ordinances and Land Use:

Chapter 2 of this plan contains information regarding existing policies, regulations, ordinances, and land use that are relevant to this hazard. For more information, see Chapter 2, Section I.

3. Community Values, Historic and Special Considerations:

Historic buildings exist in the community, a few of which are Critical Facilities. There are historic and special considerations that pose significant challenges with regard to the retrofitting of historic buildings in order to make them more resilient to natural hazards. The Town of Alapaha has one building listed in the National Register of Historic Places and Berrien County has three.

4. New Buildings and Infrastructure:

The mitigation strategy and recommendations that follow include action steps designed to protect new buildings and infrastructure from the effects of this hazard.

5. Existing Buildings and Infrastructure:

The mitigation strategy and recommendations that follow include action steps designed to protect existing buildings and infrastructure from the effects of this hazard.

C. Mitigation Strategy and Recommendations:

Goal #2: Prevent or reduce damage caused by Thunderstorms and Winds in Berrien County and in the Cities of Alapaha, Enigma, Nashville, and Ray City.

Objective #2.1: Minimize losses to existing and future structures, especially Critical Facilities and Infrastructure, due to Thunderstorms and Winds.

Activity #2.1.2	Educate the public concerning wind ratings and encourage new construction to be built to those minimum wind standards, including the wind retrofitting of Critical Facilities and existing buildings in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City.
Priority Level	Medium Priority
Responsible Agency/Jurisdiction	Berrien County EMA
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds/GEMA/FEMA
Savings/Benefit Estimate	\$172,000.00 per occurrence
Status	Ongoing

Activity #2.1.3	Study Critical Facilities in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City to determine if they require wind retrofitting.
Priority Level	Medium Priority
Responsible Agency/Jurisdiction	Berrien County EMA
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds/GEMA/FEMA
Savings/Benefit Estimate	\$172,000.00 per occurrence
Status	Ongoing

D. Special Multi-Jurisdictional Strategy and Considerations:

Most of the strategies outlined above apply to and are intended to be carried out by each of the local jurisdictions. In certain cases, where the action step may not apply to all jurisdictions, the applicable jurisdictions are noted in the table.

E. Local Public Information and Awareness Strategy:

All sections of the Plan shall be monitored and evaluated annually by the County Emergency Management Agency. Incremental accomplishments of Mitigation Goals, Objectives, and Action Steps will be reported to the public through appropriate means (news media, social media, web pages, City Council and County Commission meetings, etc.). By utilizing available resources, each jurisdiction will keep the public constantly informed of the development of these strategies and of how citizens can best assist with and/or take advantage of these efforts.

The major criteria to measure plan success will be the number of Goals, Objectives, and Action Steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property. For further details on plan execution, see Chapter 6.

F. Changes from the Previous Plan

None.

Deleted Action Steps

(none)

Action Steps Considered But Ultimately Not Added

(none)

Section III. Hurricanes/Tropical Storms

A. Community Mitigation Goals

As previously indicated in Chapter 2, hurricanes and tropical storms may cause substantial damage to life, property, and the economy in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. They are usually accompanied by some advanced notice, giving the community time to prepare and/or evacuate. The HMPUC believes that, because these extreme weather events have the potential to cause great damage, injury, and loss of life, a comprehensive range of Mitigation Goals, Objectives, and Action Steps (contained in Section C below) should be implemented to reduce this hazard's potential impact on the community.

B. Identification and Analysis of Comprehensive Range of Mitigation Options

1. Structural and Non-Structural Mitigation:

This Hazard Mitigation Plan contains both structural and non-structural options. For more information, see the comprehensive range of Mitigation Goals, Objectives, and Action Steps contained in Section C below.

2. Existing Policies, Regulations, Ordinances and Land Use:

Chapter 2 of this plan contains information regarding existing policies, regulations, ordinances, and land use that are relevant to this hazard. For more information, see Chapter 2, Section VIII.

3. Community Values, Historic and Special Considerations:

Historic buildings exist in the community, a few of which are Critical Facilities. There are historic and special considerations that pose significant challenges with regard to the retrofitting of historic buildings in order to make them more resilient to natural hazards. The Town of Alapaha has one building listed in the National Register of Historic Places and Berrien County has three.

4. New Buildings and Infrastructure:

The mitigation strategy and recommendations that follow include action steps designed to protect new buildings and infrastructure from the effects of this hazard.

5. Existing Buildings and Infrastructure:

The mitigation strategy and recommendations that follow include action steps designed to protect existing buildings and infrastructure from the effects of this hazard.

C. Mitigation Strategy and Recommendations

Goal 3: Prevent or reduce damage caused by Hurricanes/Tropical Storms in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City.

Objective 3.1: Minimize losses to existing and future structures, especially Critical Facilities and Infrastructure, and the public, due to Hurricanes/Tropical Storms.

Activity #3.1.2	Work with GDOT to improve unsafe roads in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City that already are, or could be, evacuation routes.
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds
Savings/Benefit Estimate	\$12,750,000.00 per occurrence
Status	Ongoing

Objective #3.2: Advise the public of health & safety precautions and procedures necessary during Hurricanes/Tropical Storms and other events and on pre-disaster mitigation, in general, in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City.

Activity #3.2.1	Acquire and distribute information concerning pre-disaster mitigation to area news markets, on social media, and in other appropriate outlets in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds
Savings/Benefit Estimate	\$12,750,000.00 per occurrence
Status	Ongoing

Objective #3.3: Ensure reliable electrical power and communications efficiency at Critical Facilities and among agencies during Hurricanes/Tropical Storms and other events in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City.

Activity #3.3.1a	Purchase and install portable and fixed generators (including transfer switches and pre-wiring) and trailers for use at Critical Facilities, gas pumps, and other locations where they are needed in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$60,000.00 per generator
Funding Source(s)	General Funds/GEMA/FEMA
Savings/Benefit Estimate	\$12,750,000.00 per occurrence
Status	Ongoing

Activity #3.3.1b	Create a list of generators, trailers, and gas pumps for use in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds/GEMA/FEMA/Homeland Security/Red Cross
Savings/Benefit Estimate	N/A
Status	Ongoing

D. Special Multi-Jurisdictional Strategy and Considerations:

Most of the strategies outlined above apply to and are intended to be carried out by each of the local jurisdictions. In certain cases, where the action step may not apply to all jurisdictions, the applicable jurisdictions are noted in the table.

E. Local Public Information and Awareness Strategy:

All sections of the Plan shall be monitored and evaluated annually by the County Emergency Management Agency. Incremental accomplishments of Mitigation Goals, Objectives, and Action Steps will be reported to the public through appropriate means (news media, social media, web pages, City Council and County Commission meetings, etc.). By utilizing available resources, each jurisdiction will keep the public constantly informed of the development of these strategies and of how citizens can best assist with and/or take advantage of these efforts.

The major criteria to measure plan success will be the number of Goals, Objectives, and Action Steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property. For further details on plan execution, see Chapter 6.

F. Changes from the Previous Plan

Completed Action Steps

- Activity #3.1.3: Install automated recorders and create an information line at the Berrien County Commission to educate and inform the public on hazardous weather information, closings, events, etc.
- Activity #3.1.5: Apply for First Responder/Homeland Security trailer to be used for emergency services in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City.

Other Changes

- Wording was modified on Activity #3.3.1a.

Deleted Action Steps

(none)

Action Steps Considered But Ultimately Not Added

(none)

Section IV. Drought

A. Community Mitigation Goals

As previously indicated in Chapter 2, drought may cause substantial economic, property, and personal damage in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City particularly in the form of crop damage. Its effects can be long-term, with the damage increasing as time goes by. In addition, drought conditions can contribute to wildfires in the community. The HMPUC believes that, due to the damage drought can cause, a comprehensive range of Mitigation Goals, Objectives, and Action Steps (contained in Section C below) should be implemented to reduce this hazard's potential impact on the community.

B. Identification and Analysis of Comprehensive Range of Mitigation Options

1. Structural and Non-Structural Mitigation:

This Hazard Mitigation Plan contains both structural and non-structural options. For more information, see the comprehensive range of Mitigation Goals, Objectives, and Action Steps contained in Section C below.

2. Existing Policies, Regulations, Ordinances and Land Use:

Chapter 2 of this plan contains information regarding existing policies, regulations, ordinances, and land use that are relevant to this hazard. For more information, see Chapter 2, Section V.

3. Community Values, Historic and Special Considerations:

Historic buildings exist in the community, a few of which are Critical Facilities. There are historic and special considerations that pose significant challenges with regard to the retrofitting of historic buildings in order to make them more resilient to natural hazards. The Town of Alapaha has one building listed in the National Register of Historic Places and Berrien County has three.

4. New Buildings and Infrastructure:

The mitigation strategy and recommendations that follow include action steps designed to protect new buildings and infrastructure from the effects of this hazard.

5. Existing Buildings and Infrastructure:

The mitigation strategy and recommendations that follow include action steps designed to protect existing buildings and infrastructure from the effects of this hazard.

C. Mitigation Strategy and Recommendations

Goal #4: Prevent or reduce damage caused by Drought in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City.

Objective #4.1: Minimize losses to existing and future structures, especially Critical Facilities and Infrastructure, due to Drought.

Activity #4.1.1	Work with DCA, Seven Rivers RC&D, and other appropriate organizations to provide wells to low-moderate income individuals affected by Drought in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/ City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$50,000.00
Funding Source(s)	General Funds/HUD CDBG Seven Rivers RC & D Loans
Savings/Benefit Estimate	\$60,000.00 per occurrence
Status	Ongoing

Activity #4.1.3	Replace antiquated water & sewer lines and equipment prone to failure in unincorporated Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City through CDBG grant funds and other funds when available.
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/ City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$500,000.00 per project
Funding Source(s)	General Funds/HUD CDBG
Savings/Benefit Estimate	\$1,860,000.00 per occurrence
Status	Ongoing

Activity #4.1.5	Promote increased usage of surface water and surface artesian flow for irrigation instead of well systems in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City
Priority Level	Med. Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/ City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds
Savings/Benefit Estimate	\$1,860,000.00 per occurrence
Status	Ongoing

D. Special Multi-Jurisdictional Strategy and Considerations:

Most of the strategies outlined above apply to and are intended to be carried out by each of the local jurisdictions. In certain cases, where the action step may not apply to all jurisdictions, the applicable jurisdictions are noted in the table.

E. Local Public Information and Awareness Strategy:

All sections of the Plan shall be monitored and evaluated annually by the County Emergency Management Agency. Incremental accomplishments of Mitigation Goals, Objectives, and Action Steps will be reported to the public through appropriate means (news media, social media, web pages, City Council and County Commission meetings, etc.). By utilizing available resources, each jurisdiction will keep the public constantly informed of the development of these strategies and of how citizens can best assist with and/or take advantage of these efforts.

The major criteria to measure plan success will be the number of Goals, Objectives, and Action Steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property. For further details on plan execution, see Chapter 6.

F. Changes from the Previous Plan

Completed Action Steps

None.

Deleted Action Steps

(none)

Action Steps Considered But Ultimately Not Added

(none)

Section V. Wildfires

A. Community Mitigation Goals

As previously indicated in Chapter 2, this hazard may cause substantial damage to life, property, and the economy in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. Wildfires are unpredictable and can happen at any place and at any time. Due to the great damage it may cause, the HMPUC believes that the comprehensive range of Mitigation Goals, Objectives, and Action Steps (contained in Section C below) should be implemented to reduce this hazard's potential impact on the community.

B. Identification and Analysis of the Comprehensive Range of Mitigation Options

1. Structural and Non-Structural Mitigation:

This Hazard Mitigation Plan contains both structural and non-structural options. For more information, see the comprehensive range of Mitigation Goals, Objectives, and Action Steps contained in Section C below.

2. Existing Policies, Regulations, Ordinances and Land Use:

Chapter 2 of this plan contains information regarding existing policies, regulations, ordinances, and land use that are relevant to this hazard. For more information, see Chapter 2, Section VII.

3. Community Values, Historic and Special Considerations:

Historic buildings exist in the community, a few of which are Critical Facilities. There are historic and special considerations that pose significant challenges with regard to the retrofitting of historic buildings in order to make them more resilient to natural hazards. The Town of Alapaha has one building listed in the National Register of Historic Places and Berrien County has three.

4. New Buildings and Infrastructure:

The mitigation strategy and recommendations that follow include action steps designed to protect new buildings and infrastructure from the effects of this hazard.

5. Existing Buildings and Infrastructure:

The mitigation strategy and recommendations that follow include action steps designed to protect existing buildings and infrastructure from the effects of this hazard.

C. Mitigation Strategy and Recommendation

Goal #5: Prevent or reduce damage caused by Wildfire in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City.

Objective #5.1: Minimize losses to existing and future structures, especially Critical Facilities and Infrastructure, and woodlands due to wildfire.

Activity #5.1.1	Provide additional first responder training, air units, air unit chargers, Class A Pumper & Fire Knocker trucks and other equipment to all Berrien County Volunteer, the Town of Alapaha and the Cities of Enigma, Nashville and Ray City Fire Departments for Wildfire use
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$7,000,000.00
Funding Source(s)	General Funds/GEMA/FEMA/Homeland Security
Savings/Benefit Estimate	6 minute response 90% of time=\$23,500.00 savings per household occurrence
Status	Ongoing

Activity #5.1.3	Partner with the Georgia Forestry Commission and other relevant personnel to train all Berrien County, Town of Alapaha and Town of Enigma, Nashville and Ray City Fire Departments on Wildfire strategy and tactics
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/ City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds/GEMA/FEMA/Homeland Security
Savings/Benefit Estimate	6 minute response 90% of time=\$23,500.00 savings per household occurrence
Status	Ongoing

Activity #5.1.4	Support & enforce GA Forestry Commission burn ordinances and bans and promote hazardous fuel reduction by prescribed burning, mechanical or chemical treatment carried out and promoted by the GA Forestry in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/ City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds
Savings/Benefit Estimate	\$61,000.00 per household occurrence
Status	Ongoing

Activity #5.1.7	Develop and equip a Hazardous Materials Team to deal with agricultural chemicals during wildfire events.
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/ City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$100,000.00
Funding Source(s)	General Funds/GEMA/FEMA/Homeland Security
Savings/Benefit Estimate	6 minute response 90% of time = \$23,500.00 savings per household occurrence
Status	Ongoing

Activity #5.1.8	In the Town of Alapaha and the Town of Enigma, replace the four inch (4”) (and smaller) water lines with six inch (6”) water lines and hydrants.
Priority Level	High Priority
Responsible Agency/Jurisdiction	Town of Alapaha/Town of Enigma
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$500,000.00 each project
Funding Source(s)	General Funds
Savings/Benefit Estimate	6 minute response 90% of time=\$23,500.00 savings per household occurrence
Status	Ongoing

Activity #5.1.9	Encourage agencies and private property owners to trim tree lines and create fire buffers/breaks around Critical Facilities, new and existing homes, businesses and utilities in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/ City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds
Savings/Benefit Estimate	\$61,000.00 per household occurrence
Status	Ongoing

Activity #5.1.10	Create new ordinances and enforce existing ordinances for new and existing construction that will help in the pre-disaster mitigation of wildfire
Priority Level	Medium Priority
Responsible Agency/Jurisdiction	All Jurisdictions
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds
Savings/Benefit Estimate	\$61,000.00 per household occurrence
Status	Ongoing

Activity #5.1.11	Work with developers and homeowners to pre-plan each building site and/or subdivision to help in pre-disaster mitigation of wildfire
Priority Level	Medium Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/ City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds
Savings/Benefit Estimate	\$61,000.00 per household occurrence
Status	Ongoing

Activity #5.1.12	Working with the Georgia Forestry Commission and others, conduct a survey and assessment of areas and communities in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City that are at risk of Wildfire, assess the level of threats, evaluate resources and tactics and recommend improvements.
Priority Level	Medium Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/ City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds
Savings/Benefit Estimate	6 minute response 90% of time=\$23,500.00 savings per household occurrence
Status	Ongoing

Objective #5.2: Obtain a FireWise Community Status by educating the Berrien County, Town of Alapaha and Town of Enigma, Nashville and Ray City Fire Department personnel and the public on the hazards of Wildfire and the pre-disaster mitigation thereof.

Activity #5.2.1	Maintain good public relations between the citizens of Berrien County, the Town of Alapaha, the Cities of Enigma, Nashville and Ray City and the County/City Fire Departments and plan to increase levels of awareness and resources during peak hazard conditions through the use of education sessions, community meetings, etc.
Priority Level	Medium Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/ City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds
Savings/Benefit Estimate	\$61,000.00 per household occurrence
Status	Ongoing

Activity #5.2.3	Partner with the Georgia Forestry Commission to provide education to Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City communities and citizens on the pre-disaster mitigation of wildfire and use & develop grade school based programs to educate children.
Priority Level	Medium Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/ City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds
Savings/Benefit Estimate	\$61,000.00 per household occurrence
Status	Ongoing

Activity #5.2.4	Plan RFD meetings in Berrien County, the Town of Alapaha and the Cities of Enigma, Nashville and Ray and hold joint mock fire drills for all fire departments.
Priority Level	Medium Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/ City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds
Savings/Benefit Estimate	6 minute response 90% of time=\$23,500.00 savings per household occurrence
Status	Ongoing

D. Special Multi-Jurisdictional Strategy and Considerations:

Most of the strategies outlined above apply to and are intended to be carried out by each of the local jurisdictions. In certain cases, where the action step may not apply to all jurisdictions, the applicable jurisdictions are noted in the table.

E. Local Public Information and Awareness Strategy:

All sections of the Plan shall be monitored and evaluated annually by the County Emergency Management Agency. Incremental accomplishments of Mitigation Goals, Objectives, and Action Steps will be reported to the public through appropriate means (news media, social media, web pages, City Council and County Commission meetings, etc.). By utilizing available resources, each jurisdiction will keep the public constantly informed of the development of these strategies and of how citizens can best assist with and/or take advantage of these efforts.

The major criteria to measure plan success will be the number of Goals, Objectives, and Action Steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property. For further details on plan execution, see Chapter 6.

F. Changes from the Previous Plan

Completed Action Steps

- Activity #5.1.5: Plan to acquire property for new Volunteer Fire Stations and/or new additions to those existing stations in Berrien County, the Town of Alapaha and the Cities of Enigma and Nashville.

Deleted Action Steps

(none)

Action Steps Considered But Ultimately Not Added

(none)

Section VI. Hail

A. Community Mitigation Goals

As previously indicated in Chapter 2, this hazard may cause substantial damage to life, property, and the economy in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. Hail is unpredictable and can happen at any place and at any time. Due to the damage it may cause, the HMPUC believes that the comprehensive range of Mitigation Goals, Objectives, and Action Steps (contained in Section C below) should be implemented to reduce this hazard's potential impact on the community.

B. Identification and Analysis of Comprehensive Range of Mitigation Options

1. Structural and Non-Structural Mitigation:

This Hazard Mitigation Plan contains both structural and non-structural options. For more information, see the comprehensive range of Mitigation Goals, Objectives, and Action Steps contained in Section C below.

2. Existing Policies, Regulations, Ordinances and Land Use:

Chapter 2 of this plan contains information regarding existing policies, regulations, ordinances, and land use that are relevant to this hazard. For more information, see Chapter 2, Section III.

3. Community Values, Historic and Special Considerations:

Historic buildings exist in the community, a few of which are Critical Facilities. There are historic and special considerations that pose significant challenges with regard to the retrofitting of historic buildings in order to make them more resilient to natural hazards. The Town of Alapaha has one building listed in the National Register of Historic Places and Berrien County has three.

4. New Buildings and Infrastructure:

The mitigation strategy and recommendations that follow include action steps designed to protect new buildings and infrastructure from the effects of this hazard.

5. Existing Buildings and Infrastructure:

The mitigation strategy and recommendations that follow include action steps designed to protect existing buildings and infrastructure from the effects of this hazard.

C. Mitigation Strategy and Recommendations

Goal #6: Prevent or reduce damage caused by Hail in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City.

Objective #6.1: Minimize losses to existing and future structures, especially Critical Facilities and Infrastructure, due to Hail in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City.

Activity #6.1.1	Encourage the installation of storm windows on new and existing Critical Facilities and promote their installation on new and existing private buildings in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$5,000.00 each project
Funding Source(s)	General Funds
Savings/Benefit Estimate	\$20,000.00 per occurrence
Status	Ongoing

Activity #6.1.2	Continue to encourage public to include hail damage under insurance coverage and store equipment & vehicles under shelters in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds
Savings/Benefit Estimate	\$20,000.00 per occurrence
Status	Ongoing

D. Special Multi-Jurisdictional Strategy and Considerations:

Most of the strategies outlined above apply to and are intended to be carried out by each of the local jurisdictions. In certain cases, where the action step may not apply to all jurisdictions, the applicable jurisdictions are noted in the table.

E. Local Public Information and Awareness Strategy:

All sections of the Plan shall be monitored and evaluated annually by the County Emergency Management Agency. Incremental accomplishments of Mitigation Goals, Objectives, and Action Steps will be reported to the public through appropriate means (news media, social media, web pages, City Council and County Commission meetings, etc.). By utilizing available resources, each jurisdiction will keep the public constantly informed of the development of these strategies and of how citizens can best assist with and/or take advantage of these efforts.

The major criteria to measure plan success will be the number of Goals, Objectives, and Action Steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property. For further details on plan execution, see Chapter 6.

F. Changes from the Previous Plan

None.

Deleted Action Steps

(none)

Action Steps Considered But Ultimately Not Added

(none)

Section VII. Tornadoes

A. Community Mitigation Goals

As previously indicated in Chapter 2, this hazard may cause substantial damage to life, property, and the economy in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. Tornadoes are unpredictable and can happen at any place and at any time. Because these tornadoes may be extremely powerful and cause great damage, the HMPUC believes that the comprehensive range of Mitigation Goals, Objectives, and Action Steps (contained in Section C below) should be implemented to reduce this hazard's potential impact on the community.

B. Identification and Analysis of Comprehensive Range of Mitigation Options

1. Structural and Non-Structural Mitigation:

This Hazard Mitigation Plan contains both structural and non-structural options. For more information, see the comprehensive range of Mitigation Goals, Objectives, and Action Steps contained in Section C below.

2. Existing Policies, Regulations, Ordinances and Land Use:

Chapter 2 of this plan contains information regarding existing policies, regulations, ordinances, and land use that are relevant to this hazard. For more information, see Chapter 2, Section II.

3. Community Values, Historic and Special Considerations:

Historic buildings exist in the community, a few of which are Critical Facilities. There are historic and special considerations that pose significant challenges with regard to the retrofitting of historic buildings in order to make them more resilient to natural hazards. The Town of Alapaha has one building listed in the National Register of Historic Places and Berrien County has three.

4. New Buildings and Infrastructure:

The mitigation strategy and recommendations that follow include action steps designed to protect new buildings and infrastructure from the effects of this hazard.

5. Existing Buildings and Infrastructure:

The mitigation strategy and recommendations that follow include action steps designed to protect existing buildings and infrastructure from the effects of this hazard.

C. Mitigation Strategy and Recommendation:

Goal #7: Prevent or reduce damage caused by Tornadoes in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City.

Objective #7.1: Minimize losses to existing and future structures, especially Critical Facilities and Infrastructure, due to Tornadoes.

Activity #7.1.1	Use building inspection program to inspect for adequate tie-downs on manufactured housing in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/City of Nashville/City of Ray City Building & Codes Dept.
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds
Savings/Benefit Estimate	\$3,314,000.00 per occurrence
Status	Ongoing

Activity #7.1.2	Plan for pre-disaster mitigation in Tornado & other hazard seasons by preparing public service announcements, brochures and solicit business participation in distributing information.
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds
Savings/Benefit Estimate	\$3,314,000.00 per occurrence
Status	Ongoing

Activity #7.1.4	Secure funding for a hazardous weather alert system (horn) in the Town of Alapaha, the Cities of Enigma, Nashville and Ray City and in populated areas of Berrien County
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$15,000 for each jurisdiction
Funding Source(s)	General Funds/GEMA/FEMA
Savings/Benefit Estimate	Lives of 2.57 persons average per household event based on 2000 U.S. Census household size
Status	Ongoing

Activity #7.1.5	Develop a public list of an updated address based system to physically notify and check on high risk residents both before and after natural disaster events in the Town of Alapaha, the Cities of Enigma, Nashville and Ray City and in populated areas of Berrien County
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$10,000.00
Funding Source(s)	General Funds/GEMA/FEMA
Savings/Benefit Estimate	Lives of 2.57 persons average per household event based on 2000 U.S. Census household size
Status	Ongoing

D. Special Multi-Jurisdictional Strategy and Considerations:

Most of the strategies outlined above apply to and are intended to be carried out by each of the local jurisdictions. In certain cases, where the action step may not apply to all jurisdictions, the applicable jurisdictions are noted in the table.

E. Local Public Information and Awareness Strategy:

All sections of the Plan shall be monitored and evaluated annually by the County Emergency Management Agency. Incremental accomplishments of Mitigation Goals, Objectives, and Action Steps will be reported to the public through appropriate means (news media, social media, web pages, City Council and County Commission meetings, etc.). By utilizing available resources, each jurisdiction will keep the public constantly informed of the development of these strategies and of how citizens can best assist with and/or take advantage of these efforts.

The major criteria to measure plan success will be the number of Goals, Objectives, and Action Steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property. For further details on plan execution, see Chapter 6.

F. Changes from the Previous Plan

None.

Deleted Action Steps

(none)

Action Steps Considered But Ultimately Not Added

(none)

Section VIII. Severe Winter Storms

A. Community Mitigation Goals

As previously indicated in Chapter 2, severe winter storms may cause substantial economic, property, and personal damage in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. Severe winter storms are usually predictable ahead of time, but they can still cause substantial problems. Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City do not have the specialized equipment used during severe winter storms that most northern counties and cities possess. The HMPUC believes that, due to the damage these severe winter storms have the potential to cause, a comprehensive range of Mitigation Goals, Objectives, and Action Steps (contained in Section C below) should be implemented to reduce this hazard's potential impact on the community.

B. Identification and Analysis of Comprehensive Range of Mitigation Options

1. Structural and Non-Structural Mitigation:

This Hazard Mitigation Plan contains both structural and non-structural options. For more information, see the comprehensive range of Mitigation Goals, Objectives, and Action Steps contained in Section C below.

2. Existing Policies, Regulations, Ordinances and Land Use:

Chapter 2 of this plan contains information regarding existing policies, regulations, ordinances, and land use that are relevant to this hazard. For more information, see Chapter 2, Section VI.

3. Community Values, Historic and Special Considerations:

Historic buildings exist in the community, a few of which are Critical Facilities. There are historic and special considerations that pose significant challenges with regard to the retrofitting of historic buildings in order to make them more resilient to natural hazards. The Town of Alapaha has one building listed in the National Register of Historic Places and Berrien County has three.

4. New Buildings and Infrastructure:

The mitigation strategy and recommendations that follow include action steps designed to protect new buildings and infrastructure from the effects of this hazard.

5. Existing Buildings and Infrastructure:

The mitigation strategy and recommendations that follow include action steps designed to protect existing buildings and infrastructure from the effects of this hazard.

C. Mitigation Strategy and Recommendations

Goal #8: Prevent or reduce damage caused by Severe Winter Storms in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City.

Objective #8.1: Minimize losses to existing and future structures, especially Critical Facilities and Infrastructure, due to Severe Winter Storms.

Activity #8.1.1	Continue the policy of wrapping exposed piping with insulation and installing new insulation layers at critical facilities in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Cities of Enigma/City of Nashville/City of Ray City Public Works Dept.
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$5,000 per year
Funding Source(s)	General Funds
Savings/Benefit Estimate	\$10,000.00 per building occurrence
Status	Ongoing

Activity #8.1.2	Maintain temperatures above 32 degrees to prevent freezing in government owned occupied and unoccupied structures in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City.
Priority Level	Med. Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Cities of Enigma/City of Nashville/City of Ray City Public Works Dept.
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds
Savings/Benefit Estimate	\$10,000.00 per building occurrence
Status	Ongoing

Activity #8.1.3	Disseminate information to the public concerning Severe Winter Storms, champion new construction being built to appropriate low temperature ratings and existing buildings being retrofitted in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City.
Priority Level	Med. Priority
Responsible Agency/Jurisdiction	Berrien County EMA
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	Staff Time
Funding Source(s)	General Funds/GEMA/FEMA
Savings/Benefit Estimate	\$10,000.00 per building occurrence
Status	Ongoing

D. Special Multi-Jurisdictional Strategy and Considerations:

Most of the strategies outlined above apply to and are intended to be carried out by each of the local jurisdictions. In certain cases, where the action step may not apply to all jurisdictions, the applicable jurisdictions are noted in the table.

E. Local Public Information and Awareness Strategy:

All sections of the Plan shall be monitored and evaluated annually by the County Emergency Management Agency. Incremental accomplishments of Mitigation Goals, Objectives, and Action Steps will be reported to the public through appropriate means (news media, social media, web pages, City Council and County Commission meetings, etc.). By utilizing available resources, each jurisdiction will keep the public constantly informed of the development of these strategies and of how citizens can best assist with and/or take advantage of these efforts.

The major criteria to measure plan success will be the number of Goals, Objectives, and Action Steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property. For further details on plan execution, see Chapter 6.

F. Changes from the Previous Plan

None.

Deleted Action Steps

(none)

Action Steps Considered But Ultimately Not Added

(none)

Chapter 5. Local Technological Hazard Mitigation Goals and Objectives

Overall Community Mitigation Goals, Policies, and Values Narrative

The purpose of the Berrien County Hazard Mitigation Plan is to not only assess the vulnerability of the area to natural hazards, but to identify those action steps that may need to be undertaken to reduce the potential loss of life and property from identified technological hazards. As in the case of natural hazards, the development of this plan requires an overall set of community goals that clearly state the community's commitment to reducing or avoiding the long-term vulnerabilities to the identified hazards. With these overall goals in place, more specific goals, objectives, and action steps to protect the community from the identified hazards can then be developed. Using the findings from the Risk Assessment as a guide, the HMPUC has developed the following overall community mitigation goals:

Goal 1: Protect the public health and safety;

Goal 2: Eliminate or reduce exposure of critical community facilities to the hazards identified in the community risk assessment;

Goal 3: Where exposure to hazards cannot be limited, implement, to the extent resources are available, the action steps needed to reduce the potential loss of life and property;

Goal 4: Maintain and/or enhance the community's capacity to issue warnings and to respond promptly and effectively in a hazard event.

With these overall community mitigation goals in place, the following Goals, Objectives, and Action Steps have been developed to specifically address the technological hazards identified in Chapter 3. In addition, the same methodology as in Chapter 4 was utilized in ranking the priority of each action step.

There have not been any changes in the overall priorities since the previous plan was completed.

Section I. Hazardous Materials Release

A. Community Mitigation Goals

As previously indicated in Chapter 3, a hazardous materials release may cause substantial damage to life, property, and the economy in Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. Such events can occur with little or no warning, giving the community no time to prepare and/or evacuate. The HMPUC believes that, because these events have the potential to cause great damage, injury, and loss of life, a comprehensive range of Mitigation Goals, Objectives, and Action Steps (contained in Section C below) should be implemented to reduce this hazard's potential impact on the community.

B. Identification and Analysis of Comprehensive Range of Mitigation Options

1. Structural and Non-Structural Mitigation:

This Hazard Mitigation Plan contains both structural and non-structural options. For more information, see the comprehensive range of Mitigation Goals, Objectives, and Action Steps contained in Section C below.

2. Existing Policies, Regulations, Ordinances and Land Use:

Chapter 2 of this plan contains information regarding existing policies, regulations, ordinances, and land use that are relevant to this hazard. For more information, see Chapter 3, Section I.

3. Community Values, Historic and Special Considerations:

Historic buildings exist in the community, a few of which are Critical Facilities. There are historic and special considerations that pose significant challenges with regard to the retrofitting of historic buildings in order to make them more resilient to natural hazards. The Town of Alapaha has one building listed in the National Register of Historic Places and Berrien County has three.

4. New Buildings and Infrastructure:

The mitigation strategy and recommendations that follow include action steps designed to protect new buildings and infrastructure from the effects of this hazard.

5. Existing Buildings and Infrastructure:

The mitigation strategy and recommendations that follow include action steps designed to protect existing buildings and infrastructure from the effects of this hazard.

C. Mitigation Strategy and Recommendations

Goal 1: Protect the health and safety of residents of Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City.

Objective 1.1: Enhance the ability of the Berrien County Emergency Management Agency to coordinate effectively and efficiently the emergency response during and after a hazardous materials release.

Activity #1.1.1	Develop and equip a Hazardous Materials Team to deal with agricultural chemicals during wildfire events.
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/ City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$100,000.00
Funding Source(s)	General Funds/GEMA/FEMA/Homeland Security
Savings/Benefit Estimate	6 minute response 90% of time=\$23,500.00 savings per household occurrence
Status	New

Activity #1.1.2	Continue to maintain and expand HazMat response training for first responders.
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/ City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$100,000
Funding Source(s)	General Funds/Grants
Savings/Benefit Estimate	6 minute response 90% of time=\$23,500.00 savings per household occurrence
Status	New

Objective 1.2: Minimize the effect of hazardous material spills.

Activity #1.2.1	Increase public awareness of procedures to follow if a hazardous material spill event occurs. This may be achieved by publishing information on social media or in local newspapers, by holding town hall meetings, or by providing radio announcements or bulletins to local churches and schools.
Priority Level	High Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/ City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$10,000
Funding Source(s)	General Funds/Grants
Savings/Benefit Estimate	Up to \$50,000 per HazMat spill
Status	New

Activity #1.2.2	Train local government officials on proper response procedures for hazardous material spill events.
Priority Level	Medium Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/ City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$50,000
Funding Source(s)	General Funds/Grants
Savings/Benefit Estimate	Up to \$50,000 per HazMat spill
Status	New

Activity #1.2.3	Review and update Standard Operating Procedures (SOP) for responding to a hazardous material spill event.
Priority Level	Medium Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/ City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$5,000
Funding Source(s)	General Funds/Grants
Savings/Benefit Estimate	Up to \$50,000 per HazMat spill
Status	New

Activity #1.2.4	Provide workplace training on decontamination steps.
Priority Level	Medium Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/ City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$10,000
Funding Source(s)	General Funds/Grants
Savings/Benefit Estimate	Up to \$50,000 per HazMat spill
Status	New

Activity #1.2.5	Annually review all hazardous material transportation routes, and relocate routes if necessary.
Priority Level	Medium Priority
Responsible Agency/Jurisdiction	Berrien County/Town of Alapaha/Town of Enigma/ City of Nashville/City of Ray City
Coordinating Organization	Berrien County EMA
Timeline	2019-2024
Approximate Cost	\$10,000
Funding Source(s)	General Funds/Grants
Savings/Benefit Estimate	Up to \$50,000 per HazMat spill
Status	New

D. Special Multi-Jurisdictional Strategy and Considerations:

Most of the strategies outlined above apply to and are intended to be carried out by each of the local jurisdictions. In certain cases, where the action step may not apply to all jurisdictions, the applicable jurisdictions are noted in the table.

E. Local Public Information and Awareness Strategy:

All sections of the Plan shall be monitored and evaluated annually by the County Emergency Management Agency. Incremental accomplishments of Mitigation Goals, Objectives, and Action Steps will be reported to the public through appropriate means (news media, social media, web pages, City Council and County Commission meetings, etc.). By utilizing available resources, each jurisdiction will keep the public constantly informed of the development of these strategies and of how citizens can best assist with and/or take advantage of these efforts.

The major criteria to measure plan success will be the number of Goals, Objectives, and Action Steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property. For further details on plan execution, see Chapter 6.

F. Changes from the Previous Plan

All action steps are new (this hazard was not included in the previous plan).

Chapter 6: **Executing The Plan**

Summary of changes:

- Revised and updated language.

Section I. **Implementation of the Action Plan**

A. Administrative Actions

The meetings and planning process of the HMPUC have been overseen by the Berrien County Emergency Management Agency. The Southern Georgia Regional Commission contracted with the Berrien County Commission to administer and facilitate the planning process. The Berrien County Commission and the Cities of Alapaha, Enigma, Nashville, and Ray City will adopt the Plan (on approval by GEMA and FEMA) by the resolutions contained in Appendix E.

B. Authority and Responsibility

The Berrien County Commission and the Cities of Alapaha, Enigma, Nashville, and Ray City have authorized the submission of this Plan to both GEMA and FEMA for approval.

As determined by the City and County governments and the HMPUC, the Berrien County EMA Director will be responsible for this Plan and its continued usage as a planning document. The EMA Director will oversee implementation, monitoring, and updates for all jurisdictions. The respective jurisdictions will be responsible for the implementation of their specific mitigation activities as proposed in this plan.

C. Prioritization

1. Methodology for Prioritization

In prioritizing the implementing of the action steps identified in this plan, those hazards deemed to pose the greatest threat will be given the primary consideration. In prioritizing the implementation feasibility of the action steps and projects, local governments will take into consideration the additional factors of cost and time. Those activities requiring smaller amounts of money and staff time to implement will be given highest implementation priority. Those steps requiring additional funding for equipment or staff time beyond the normal budgets of the communities will be incorporated into the budget process when possible based on the cost-benefit analysis described below.

2. Use of Cost Benefit Analysis

The data provided in Worksheet 3 will be utilized to quantify the number of persons and/or property at risk from each hazard. Combined with the criteria in Worksheet 4, this

will allow local governments to assess the potential value of at-risk properties and the resulting benefits from the proposed action steps.

In prioritizing projects, the local governments will also utilize cost benefit analysis (CBA) to evaluate the feasibility of a major project. CBA is a well-established method for quantitatively comparing the benefits and costs of mitigation projects. The end result is a Benefit-Cost Ratio (BCR), which is derived from a project's total net present value of benefits divided by the total project cost estimate, which must include all documented project and maintenance costs. The benefits of mitigation projects are avoided damages, disruptions, losses, and casualties. Examples of common benefits include avoided or reduced damages to buildings, contents, or infrastructure; avoided or reduced economic impacts of loss of function of buildings; avoided or reduced displacement costs for temporary quarters; avoided or reduced loss of public services; avoided or reduced loss of net business income; avoided or reduced economic impacts of loss of function of infrastructure; avoided or reduced road or bridge closures; avoided or reduced loss of utility services; and avoided or reduced deaths and injuries.

3. Use of Other Calculations

Additional calculations that were performed included: Availability of potential funding sources; overall feasibility; measurable milestones; public and political support for the proposed actions; and the STAPLEE criteria.

4. Use of Other Review Structure

In addition to the cost-benefit analysis, other factors that may affect the prioritization of projects include the availability of special tax, grant, and/or loan funds which become available on a limited basis to finance project implementation, such as SPLOST funds or FEMA Pre-Disaster Mitigation Program funds.

D. Incorporation of Local Hazard Mitigation Plan into Other Plans/Planning Measures

This Plan will be reviewed by Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City. The requirements of this Hazard Mitigation Plan will be taken into consideration and will be incorporated into Comprehensive Plans, Five-Year Short-Term Work Program, Capital Improvement Plans, Local Emergency Operations Plans, and all other such Plans as appropriate.

Once this plan is approved, it will be used by the consultants and planning committees responsible for the update process for the County and City Comprehensive Plans, Short-Term Work Programs, and all other plans that could incorporate the requirements of this plan.

To facilitate inclusion of this Plan, the Berrien County Commission and the Cities of Alapaha, Enigma, Nashville, and Ray City will provide a copy of this Plan to the persons and/or committees responsible for writing and updating plans.

Section II. **Evaluation and Monitoring**

A. Method

The Berrien County EMA Director will be charged with ensuring that this plan is monitored and periodically updated in subsequent years. The method that the Berrien County EMA will use to monitor the plan and evaluate implementation progress will be the following:

- The Berrien County EMA will conduct quarterly telephone interviews with the various local governments and area agencies in order to chart their plan progress.
- The EMA Director will hold formal public meetings at least once a year to monitor the progress of the plan implementation and allow the public a forum for expressing concerns, opinions, and ideas.
- Throughout the year, a series of informal meetings will be held in which various aspects of the plan, including monitoring and evaluation, are discussed.

B. Criteria Used To Monitor and Evaluate the Plan

The major criteria to measure plan success will be the number of goals, objectives, and action steps, or components thereof, that have been completed, which in turn will result in savings of life, money, and property.

Section III. **Plan Update and Maintenance**

A. Public Involvement

Because the Hazard Mitigation Plan is intended to help ensure a safe and livable environment for all Berrien County and Alapaha, Enigma, Nashville, and Ray City residents, it is imperative that public involvement be an integral part of the planning process.

Since adoption of the original Berrien County Pre-Disaster Mitigation Plan, citizens have been kept involved and apprised of plan progress through such forums as regularly scheduled County Commission meetings, public hearings, and applicable newspaper coverage. This same level of public education and awareness and citizen involvement will continue over the next five years until the next required update of the Hazard Mitigation Plan. When specific issues dictate, public hearings will be conducted, and all other community planning efforts (Comprehensive Plan, Regional Plan, etc.) will afford citizens the opportunity to participate in and comment on the need to incorporate hazard mitigation initiatives.

To facilitate the goal of continued public involvement in the planning process, the EMA will assure that the following steps are taken:

- The public will be directly involved in the update and review of the Plan.

- Copies of the plan will be kept on hand at appropriate agencies throughout the community.
- The plan will be available City, County, and/or Regional Commission websites, and will contain an e-mail address and phone number the public can use for submitting comments and concerns about the plan.
- A public meeting will be held annually to provide the public with a forum for expressing concerns, opinions, and ideas. The EMA will set meeting schedules and dates and use County resources to publicize and host this meeting.

B. Timeframe

Pursuant to the requirements set forth in the Disaster Mitigation Act of 2000, the community is again required to update and evaluate the plan no more than five years after its adoption. At least one year prior to the end of the required five-year update period, the EMA Director will begin the planning process for a new update to this plan. This will consist of establishing a new planning committee that will be tasked with completing the update following the same process used for this update.

No later than the conclusion of the five-year period following approval of the plan update, the EMA Director shall submit a revised Hazard Mitigation Plan to GEMA for its approval. It is important to note that the plan update process, as established by the planning committee, is subject to change, depending upon subsequent regulations and/or requirements set forth by GEMA and FEMA.

Chapter 7: **Conclusion**

Summary of changes:

- Revised and updated language.

Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City have suffered considerable damage in the past from natural hazards. Planning ahead and undertaking structural and nonstructural action steps before a disaster occurs can save lives and property. This philosophy has been the driving force behind the preparation of the Berrien County Hazard Mitigation Plan.

Education of the population and enhanced warning can decrease the vulnerability of the county's citizens and visitors. Continued and improved public information and communication with the population are important parts of this plan. Because of this planning process, Berrien County and Alapaha, Enigma, Nashville, and Ray City officials have gained a better understanding of the hazards affecting the community.

As a result of the planning process described in Chapter 1 and the hazard, risk, and vulnerability assessment in Chapter 2, Berrien County and the Cities of Alapaha, Enigma, Nashville, and Ray City have a realistic perspective on the hazards to which the community is exposed. With the mitigation strategy outlined in Chapter 4 and the implementation plan included in Chapter 6, the local leaders have an "action plan" to follow when allocating resources to reduce their community's vulnerability to such hazards.

References

Berrien County Board of Tax Assessors (<http://www.qpublic.net/ga/Berrien/>)

Berrien County Flood Insurance Study
(<http://www.georgiadfirm.com/status/berrien/13019cv000a.pdf>)

Berrien County website (www.berriencountygeorgia.com/)

Center for Agribusiness & Economic Development. 2016 Georgia Farm Gate Value Report.
(http://caes2.caes.uga.edu/center/caed/documents/GAFGVR2016_DEC16.pdf)

Federal Emergency Management Agency (www.fema.gov)

FEMA National Flood Insurance Program Community Status Book
(<https://www.fema.gov/national-flood-insurance-program-community-status-book>)

Georgia Data. "Agriculture." (<https://georgiadata.org/agriculture.html>)

Georgia Emergency Management Agency, Georgia Mitigation Information System
(<https://apps.itos.uga.edu/GEMA.GMIS/>)

Georgia Emergency Management and Homeland Security Agency (<http://www.gema.ga.gov/>)

Georgia Forestry Commission (www.gatrees.org)

National Oceanic and Atmospheric Administration, National Centers for Environmental Information, Storm Events Database (<http://www.ncdc.noaa.gov/stormevents/>)

National Weather Service. Archived NWS Watch/Warnings at the Iowa State University Environmental Mesonet (<https://mesonet.agron.iastate.edu/request/gis/watchwarn.phtml>)

Southern Georgia Regional Commission (www.sgrc.us)

USDOT Pipeline and Hazardous Materials Safety Administration. Office of Hazardous Materials Safety database
(<https://hazmatonline.phmsa.dot.gov/IncidentReportsSearch/IncrSearch.aspx>)

U.S. Drought Monitor (<http://droughtmonitor.unl.edu/>)

United States Census Bureau (www.census.gov)

Appendices

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Appendix A. Hazard Identification, Risk, and Vulnerability (HRV)

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- I. Floods
- II. Thunderstorms/Wind
- III. Hurricanes/Tropical Storms
- IV. Drought
- V. Wildfires
- VI. Hail
- VII. Tornadoes
- VIII. Severe Winter Storms

Section II. GMIS Critical Facilities Maps

1. Critical Facilities and Hazard Potential for Hazards Affecting the Entire Community
2. Critical Facilities and Wind Zones
3. Critical Facilities and Wildfire Hazard Areas (GMIS data)
4. Critical Facilities and Flood Zones

Section III. Other Maps

- Hurricane MEOW maps
- Tornado track map
- FEMA flood maps
- UNL Drought Monitor Map

Appendix B. Growth and Development Trends

- Census Demographic Summary
- Comprehensive Plan Short Term Work Program
- Berrien County Tax Digest
- City of Alapaha Tax Digest
- City of Enigma Tax Digest
- City of Nashville Tax Digest
- City of Ray City Tax Digest

Appendix C. Other Planning Documents

- Community Wildfire Protection Plan

Appendix D. Worksheets Used In Planning Process

- Hazard Frequency Table
- GEMA Worksheet #1
- GEMA Worksheet #2
- GEMA Worksheet #4 (for each objective)

Appendix E. Copies of Required Planning Documentation

- I. Public Notices (ongoing)
- II. Sign-in Sheets (ongoing)
- III. Adoption Resolutions [pending]

Appendix F. Reports and Inventories

- I. General Historic Reports
 1. Floods – NOAA data
 2. Thunderstorms/Wind – NOAA data

3. Hurricanes/Tropical Storms – NOAA data
4. Drought – NOAA data
5. Wildfires – GFC data
6. Hail – NOAA data
7. Tornadoes – NOAA data
8. Severe Winter Storms – NOAA data

II. Critical Facilities Inventory

Appendix G. HAZUS Report [pending]