

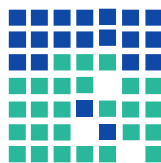


**FLOODPLAIN ORDINANCE REVIEW AND IMPROVEMENT  
FOR  
ALPINE COUNTY, DOUGLAS COUNTY, CARSON CITY AND LYON COUNTY**

***JURISDICTION INTERVIEW SUMMARIES  
AND  
HYDRAULIC MODEL IMPLEMENTATION ORDINANCES***

CARSON WATER SUBCONSERVANCY DISTRICT

DECEMBER 2016



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Planning ■ Consulting Services

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## INTRODUCTION

This Floodplain Ordinance Review and Improvement project is a multi-jurisdictional effort led by the Carson Water Subconservancy District (CWSD) to prepare for the adoption of new Flood Insurance Rate Maps (FIRMs), implementation of the Carson River Hydraulic Model and improvement of floodplain management programs and regulations. Alpine County, California, and Carson City, Douglas County and Lyon County, Nevada, will be directly affected by the improved FIRMs. These jurisdictions have varying needs and opportunities related to the implementation of new FIRMs and the use of the Carson River Hydraulic Model.

This project is one part of an ongoing, multi-phase effort by the CWSD to assist Alpine County, Douglas County, Carson City and Lyon County in improving Carson River floodplain management. The project has assisted each jurisdiction in the review and future amendment of their floodplain ordinances to incorporate the Carson River Hydraulic Model developed by HDR to accommodate the new regional floodplain mapping and flood insurance rate maps (FIRMs). Each county/city floodplain ordinance has been reviewed, the jurisdictions interviewed, and consistent ordinance language has been developed to incorporate the Carson River Hydraulic Model and its Model Management, Distribution, and Update Guide. New ordinance language has been developed for those jurisdictions that desiring to incorporate enabling language for the use of the Carson River Hydraulic Model.

## Needs and Opportunities

Each jurisdiction was visited to discuss and document their specific needs, unique circumstances, programs and opportunities in regards to floodplain management and development of ordinance revisions. Additionally, the CWSD staff was provided the chance to discuss general and specific jurisdictional needs and opportunities as viewed by the CWSD.

A summary of each jurisdiction's needs and opportunities and the CWSD staff's perspectives are provided below.

### Alpine County

- Alpine County does not currently have any FEMA floodplain mapping.
- It is the only California jurisdiction within the CWSD.
- It has unique flooding hazards (e.g., flooding due to ice dams).
- Lacks defined floodplains which will create a challenge with educating the public and local government officials (i.e., does not have a history of known floodplains or administering a floodplain management program).
- Lacks staffing and training to administer a floodplain management program and regulations.

- Needs to prepare a floodplain management ordinance that meets state and federal requirements.
- Needs technical assistance with implementing and administering a floodplain management program.
- Greatest strengths are that they are familiar with the locations where flooding occurs and there are limited locations that will be identified as a floodplain.
- This is an opportunity to revise/update/create a modern floodplain management ordinance and program.
- It will be easier to create and implement a new floodplain management program because there are limited areas and populations (i.e., specific neighborhoods) involved/affected.
- Shortcomings of the existing floodplain management program include:
  - Outdated and incomplete;
  - Does not meet minimum state and federal requirements; and
  - Does not include FEMA mapping and requirements since the County has not had any FEMA designated floodplains.
- Since the County does not currently have a floodplain management program, it is an opportunity to create a program and train the staff.
- The mitigation measures identified in the Carson Flood Mitigation Plan are generally correct.
- Low impact development (LID) standards should be implemented by resolution as part of existing development standards. Some language in County Code may be necessary to authorize the LID standards.
- The County may need to differentiate between increasing the required freeboard and protecting improvements in certain areas of the county (e.g., between steeper upper river areas and flatter lower valley areas).
- The rankings/priorities for the Carson Flood Mitigation Plan mitigation measures are accurate.
- LID should probably be included in the floodplain management ordinance/code.
- Training for County staff, the public, and civil engineers will be necessary to implement the Carson River Hydraulic Model.
- Revision of the County Code to create new, compliant floodplain management regulations which include the requirement for the use of the model in the newly identified floodplain of the West Fork of the Carson River.
- Requirements for use of the Carson River Hydraulic Model should be included in the new floodplain management ordinance. The County staff did not feel that the requirements would be appropriate for the existing provisions in County Code.
- County staff felt that further discussion was needed regarding the use of the Carson River Hydraulic Model to assess impacts of land use changes and development within the 1-percent (1%) chance and 0.2-percent (0.2%) chance floodplains. However, the staff felt that it would likely be a good idea to use the model to assess all impacts (e.g., cumulative, project specific, etc.).

- Further research and discussions with the County Building Official are needed to determine if the County's floodplain management provisions are coordinated with the County's adopted building codes.
- The County staff felt that it was likely that the County would want to coordinate the new floodplain management ordinance with the County's building codes.
- The County does not have unique requirements for revisions to County Code. However, the County must go through the CEQA process to adopt revisions to the County Code.

## Carson City

- Carson City revised its Municipal Code to be in line with the Nevada model floodplain management ordinance in 2010-2011.
- Further possible floodplain management code revisions include:
  - Increase freeboard requirement in certain cases;
  - Increase volume ratio above 1:1;
  - Utilities;
  - Lower floodway rise allowance from 1-foot to 6-inches; and
  - Adopt Carson River Hydraulic Model protocols and procedures by reference.
- Carson City has been proactive.
- The City has made a concerted effort to educate its population on floodplains and flood insurance.
- The City has implemented a stormwater hotline and the City is quick to respond to correct problems.
- The Public Works Department assists property owners with property evaluations regarding flood risk, drainage, and potential solutions.
- Consistency among departments, keeping up to date with FEMA regulations/requirements, and continuous education of the public are considered program needs or challenges.
- Communication among City departments, and with the public and professionals are considered program strengths.
- The City has a goal to become a CRS Class 4 community.
- In addition to the needs and challenges cited above, shortcomings of the existing floodplain management program include:
  - Regulations could be clearer, and there could be a closer relationship between drainage standards and floodplain requirements.
  - There could be better standards for erosion and landslides/mud flows.
  - There needs to be a better relationship between CRS points and the effort it takes to achieve the point value.
  - FEMA changing the CRS pre-requisites.
- In addition to the further possible revisions identified above, potential changes to the existing floodplain management program include:

- One person dedicated to floodplain management (This would permit improved interaction with and assistance to the community, and better understanding by the public);
  - Provide more one-on-one assistance to the public;
  - Continue open space purchases; and
  - Create a corridor for water to be conveyed from west to east through the City.
- Continued collaboration with other jurisdictions is important for making improvements in the floodplain management program.
- The mitigation measures identified in the Carson Flood Mitigation Plan are generally correct. However, transfer of developments rights should not be included as a mitigation measure for the City; the City has an effective open space program.
- Some revisions are needed to the Carson Flood Mitigation Plan ranking/priorities for Carson City.
- The Carson River Hydraulic Model protocols and procedures need to be referenced in the Municipal Code and in Division 14 of the Development Standards.
- The Carson River Hydraulic Model needs to be referenced in the Municipal Code as the means to study the Caron River floodplain.
- Carson City will need to determine how it wants to use the Carson River Hydraulic Model to assess cumulative impacts within the 1-percent chance and 0.2-percent chance floodplains.
- The City would like to use the Carson River Hydraulic Model to assess project specific impacts of land use changes on adjacent, surrounding and other properties.
- The City would initially consider using the Carson River Hydraulic Model to assess project specific impacts as a means of mitigating the following impacts:
  - Flood hazards to downstream properties and communities.  
However, it would have to be determined how far downstream analysis would be required. It also needs to be determined who is going to keep track of the downstream impacts.
  - Loss of floodplain function.
- The City is unsure about using the Carson River Hydraulic Model to assess project specific impacts as a means of mitigating the following impacts:
  - Loss of riparian habitat.  
The City has not considered this in the past and is unsure how they might use the Model for this purpose.
  - Degradation of water quality.
- The City's floodplain management ordinance/code is coordinated with the City's building codes.
- Some improvement of the floodplain management program may be possible and coordination of regulation implementation enhanced by further clarifying enforcement responsibilities among City departments (e.g., Public Works Department, Building Department, etc.).
- The City does not have unique requirements for revisions to its Municipal Code.



## Douglas County

- Douglas County is unique among the four jurisdictions due to its expansive floodplain.
- The County's floodplain management program's biggest needs or challenges are:
  - Tracking cumulative impacts (This will depend on the size of the development, and a process is needed to track the impacts and supply the information to the CWSD for updating the model.);
  - Flooding in non-mapped areas (e.g., flash flooding); and
  - Revising County Code to require agricultural structures to comply with requirements in a floodway (Although, agricultural structures within a floodway still must meet the rise in BFE standard.).
- The County's floodplain management program's greatest strengths are:
  - The GIS Department;
  - The program complies with FEMA requirements;
  - The program has a dedicated staff member to oversee the CRS program;
  - No parceling is allowed within the floodplain; and
  - Consistent application of the Code.
- Opportunities to improve the County's program are:
  - Adding compensatory storage requirements for filling in the floodplain;
  - Establishing BFEs in all identified floodplains;
  - Making the floodplain ordinance more user-friendly; and
  - Possibly removing the one-foot elevation requirement for the X-shaded flood hazard zone or adding substantial improvement standards.
- In addition to the needs and challenges cited above, shortcomings of the existing floodplain management program include:
  - Lack of compensatory storage requirements in the AO or AH flood hazard zones;
  - The Code exceptions for agriculture that currently exist; and
  - Pertaining to the CRS program:
    - Coordination with towns, agencies, special districts, etc.
    - Consolidated information from other entities (i.e., a single point data repository with the County).
- County staff would like to improve the existing floodplain management program by getting it funded, and getting an administration fee adopted as a funding mechanism.
- The mitigation measures identified in the Carson Flood Mitigation Plan are correct and County staff would like to see them included in the County's floodplain management ordinance.
- Steps need to implement the Carson River Hydraulic Model protocols and procedures include:
  - Coordination with other counties;
  - Use of the Model for all development impact analysis within the Carson River floodplain;
  - A public information and education effort on when the Model will become required;

- Revision of all application and information forms; and
  - Dissemination of information to civil engineering firms.
- Douglas County staff does not believe that it is necessary to revise the existing County Code language to implement the use of the Carson River Hydraulic Model or the Carson River Hydraulic Model protocols and procedures. County staff believes the Model's use and its procedures can be required as the best technical information available.
- The County would use the model to assess the cumulative and project specific impacts of land use changes in the one-percent chance and 0.2-percent chance floodplains.
- County staff believes it would use the Carson River Hydraulic Model to assess project specific impacts as a means of mitigating the following impacts:
  - Flood hazards to downstream properties and communities.
  - Loss of floodplain function (i.e., storage capacity).
- The County does not believe it would use the Carson River Hydraulic Model to assess project specific impacts as a means of mitigating the following impacts:
  - Loss of riparian habitat.
  - Degradation of water quality, unless the MS4 program requirements expand.
- Further discussion with the County's Building Official is needed to determine if the County's floodplain management regulations are coordinated with the adopted building codes and if revisions are needed.
- The County does not have unique requirements for revisions to County Code.

## Lyon County

- Lyon County is unique among the four jurisdictions since it has three different watersheds within the County and significant mercury pollution of the Carson River.
- The County's floodplain management program's biggest needs or challenges are the education of the public and landowners within the floodplain. This need/challenge ties in with the Nevada Division of Environmental Protection's education efforts regarding the Carson River's mercury contamination.
- The County's floodplain management program's greatest strength is its GIS mapping.
- Needs for improving and/or shortcomings of the County's program include:
  - Need for staff and staff training;
  - Need for additional public outreach; and
  - Need to make sure that the new Title 15, Consolidated Development Code, has floodplain regulations identified in all its parts where needed.
- Lyon County does not participate in the Community Rating System.
- In addition to the possible revisions identified above, potential changes to the existing floodplain management program include:
  - Better streamlining of the process; and
  - Informational materials created in a bullet print format.
- County staff would like to improve the existing floodplain management program by creating:
  - More readable and understandable information, and

- Making GIS floodplain/FIRM information readily available to the public.
- The mitigation measures identified in the Carson Flood Mitigation Plan are correct.
- The Carson Flood Mitigation Plan ranking/priorities for Lyon County are accurate.
- County staff would like to see the following mitigation measures included in the County's floodplain management ordinance:
  - Density bonuses for not developing within the floodplain;
  - Density bonuses for clustering;
  - Incentives for the use of low impact development techniques;
  - Transfer of development rights; and
  - Real estate transaction notification requirements.
- The Carson River Hydraulic Model and Carson River Hydraulic Model protocols and procedures need to be added to County Code, probably by reference.
- For the County to implement the Carson River Hydraulic Model and its procedures, it will be necessary to educate County staff, professionals and the public.
- The County would use the Model to assess the cumulative and project specific impacts of land use changes in the one-percent chance and 0.2-percent chance floodplains.
- The County would like to use the Carson River Hydraulic Model to assess project specific impacts of land use changes on adjacent, surrounding and other properties.
- The County would use the Carson River Hydraulic Model to assess project specific impacts as a means of mitigating the following impacts:
  - Flood hazards to downstream properties and communities;
  - Loss of riparian habitat;
  - Loss of floodplain function; and
  - Degradation of water quality.
- Further research is needed to determine if the County's floodplain management regulations are coordinated with the adopted building codes and if revisions are needed.
- The County does not have unique requirements for revisions to County Code.

## Carson Water Subconservancy District

The Carson Water Subconservancy District staff was interviewed to obtain a watershed perspective on the needs and opportunities of the four jurisdictions.

- CWSD staff believes that each jurisdiction has characteristics that make it unique:
  - Alpine County – The County contains the headwaters Carson River, so what happens there is critical to all of the downstream jurisdictions.
  - Carson City – The City has acquired much of the Carson River floodplain within the City's boundaries and holds it in public ownership.
  - Douglas County – The County has the primary and most extensive flood storage area. It is particularly important to the management of floods on the River. The middle section of the River through the Carson Valley will not have a floodway designated so it will need greater management. Driveways, raised road sections, and similar development features in the floodplain will require special attention

and management to perpetuate drainage and the ability of the floodplain to function. Additionally, agriculture's needs for construction within the floodplain will need to be addressed.

- Lyon County – The County has experienced development within the floodplain that has impacted floodplain function and the delineation of floodplain element boundaries. The County has flood storage areas critical to the management of floods within its portion of the River. The new FIRMs will include existing homes within the designated floodway. The approximate flood zones east of Dayton will need to be studied/modeled and new special flood hazard zones identified (i.e., base flood elevations). Additionally, a new bridge across the River will need to be constructed in the future. The bridge location, impacts, and mitigation are important considerations, and they will affect the floodplain.
- The biggest needs or challenges for floodplain management programs include:
  - Educating elected officials, planning commissions, and staff about the program and its importance is a challenge for all programs.
  - Alpine County – The County needs a new compliant floodplain management ordinance and a floodplain management program.
  - Carson City – CWSD staff did not identify needs or challenges for Carson City.
  - Douglas County – The County has challenges regarding its agricultural community, maintaining the function and storage capacity of the floodplain, and development pressure on the agricultural lands within the floodplain that would result in a reduction of storage capacity.
  - Lyon County – The County has challenges regarding development pressure on agricultural and undeveloped lands within the floodplain that would result in a reduction of storage capacity.
- The greatest strengths of the floodplain management programs include:
  - Alpine County – The small amount of floodplain within the County and landowners who are actively applying agricultural water quality improvements on their lands.
  - Carson City – The protection and public management of most of the City's Carson River floodplain, and active participation in the CRS program.
  - Douglas County – The County's long-standing implementation of a transfer of development rights program and interest in conservation easements; the existence of the County's current floodplain management program with a dedicated staff person (However, the County has a challenge in finding funding for the program); and active participation in the CRS program.
- Opportunities to improve the floodplain management programs include:
  - The development of new and revised/improved floodplain management ordinances;
  - New FIRMs with better and more realistic definition of the floodplains;
  - The ability of the jurisdictions to benefit from a regional approach that allows them to discuss, coordinate and cooperate with, and learn from each other;
  - The addition of incentives and mitigation measures to updated ordinances that reduce flood risks and maintain floodplain storage capacity; and

- Improvements to CRS ratings in participating Counties.
- The shortcomings of the existing floodplain management systems include:
  - The lack of cumulative impact analysis (A strength is that the new hydraulic model will aid in accomplishing this.);
  - Many discontinuous floodways; and
  - A lack of or limited incentives specified in floodplain ordinances to protect the floodplain from development.
- Recommended changes to the existing floodplain management programs would include:
  - Embracing the new Carson River Hydraulic Model and new FIRMs;
  - Implementing the identified mitigation measures for each jurisdiction; and
  - Each jurisdiction continuing to embrace the CWSD Floodplain Management Plan.
- The CWSD staff believes that the mitigation measures identified in the Carson River Mitigation Plan are accurate and the staff would see some of the measures as being higher in priority from a watershed perspective.
- The CWSD staff would see low impact development standards, transfer of development rights programs and conservation easement programs as mitigation measures applicable to each of the jurisdictions, and measures to be included in each jurisdiction's floodplain management ordinance.
- The CWSD staff believes that implementation of the Carson River Hydraulic Model and its protocols and procedures requires:
  - Each jurisdiction to pass enabling language in their City/County Codes; and
  - Training for city/county staff, planning commissioners, and others.

## Needs and Opportunities Conclusions

Additional support is needed for Alpine County, Carson City, Douglas County and Lyon County to implement the use of the Carson River Hydraulic Model, achieve their identified mitigation measures, and continue to improve their floodplain management programs. Some entities have more mature programs and can continue to make modest advances over an extended period. However, none of the jurisdictions have the staff or financial resources necessary to independently complete their identified improvements and mitigation measures in a timely manner.

An overarching need is the training of city/county staff, elected officials, planning commissioners, professionals and the public regarding the new FIRMs and the Carson River Hydraulic Model. All of the jurisdictions require assistance for this training.

Technical and staff support are necessary to assist the jurisdictions in developing, preparing and adopting ordinances to implement identified mitigation measures. Additional technical and staff support may be needed to develop the identified plan and program mitigation measures.

Continuing regional support by the CWSD will be necessary to oversee, coordinate, maintain, and manage the Carson River Hydraulic Model. This is also true for maintaining and updating the

regional Floodplain Management Plan. Additionally, the regional approach to management of the Carson River empowered by the CWSD must be continued to allow the jurisdictions to discuss, coordinate and cooperate with, and learn from each other.

Alpine County will need extensive support to develop, adopt and implement a floodplain management program and ordinance. The County has the greatest need of any of the four jurisdictions for assistance with preparing a floodplain ordinance since it has not previously had FIRMs and does not have a conforming ordinance to modify. It will need additional assistance to develop and implement its other identified mitigation measures.

Carson City, Douglas County, and Lyon County each have differing floodplain management program strengths and improvement opportunities. Their needs for facilitating implementation of their identified mitigation measures also vary. However, each will require some support and assistance to make timely progress.

## Preliminary Draft Floodplain Management Ordinance Language

Prepare preliminary draft floodplain management ordinance language for use by each jurisdiction incorporating the previously identified mitigation measures, and Carson River Model Protocol and Procedures, as applicable.

### Generic Language

Preliminary draft generic floodplain management ordinance language is provided in Appendix 2 for the use of any jurisdiction.

### Alpine County

Alpine County staff believes that it needs to incorporate the use of the Carson River Hydraulic Model, the Carson River Hydraulic Model Procedures/Guidance and identified mitigation measures into a new, complete floodplain management ordinance. The staff does not believe that adding provisions into the existing code language would be appropriate.

### Carson City

Carson City staff believes that use of the Carson River Hydraulic Model and the Carson River Hydraulic Model Guide should be adopted by means of a revision to the existing Municipal Code. They believe that adoption by reference is appropriate.

Specific preliminary draft floodplain management revision language is provided in Appendix 3 for the revision of the Carson City Municipal Code

## Douglas County

Douglas County staff believes that its current code language is sufficient to incorporate the use of the Carson River Hydraulic Model, and the Carson River Hydraulic Model Procedures/Guidance. The staff does not believe that adding enabling provisions into the existing code language is necessary.

## Lyon County

Lyon County staff believes that use of the Carson River Hydraulic Model and the Carson River Hydraulic Model Guide should be adopted by means of a revision to its County Code. They believe that adoption by reference is appropriate.

Specific preliminary draft floodplain management revision language is provided in Appendix 4 for the revision of the Lyon County Code

## Appendix 1 – Jurisdiction Specific Needs and Opportunities

### Interview Questions

Purpose: To discuss and document each jurisdiction's specific needs, unique circumstances, programs, and opportunities in regards to floodplain management and development of ordinance revisions.

Questions:

1. What makes your jurisdiction unique from others in regards to floodplain management?
2. What are your biggest needs or challenges regarding your jurisdiction's floodplain management program?
3. What do you see as your floodplain management program's greatest strengths?
4. What opportunities do you see to improve your floodplain management program?
5. What are the shortcomings of the existing floodplain management system?
  - a. Floodplain management ordinance/code?
  - b. Regulations/requirements?
  - c. Standards?
  - d. Community Rating System?
6. What would you change in the existing floodplain management program? How would you change it?
7. What improvements would you make in the existing floodplain management program?
8. Are the Carson Flood Mitigation Plan mitigation measures still accurate for your jurisdiction? If not, what changes or additions would you make?
9. Are the rankings/priorities for the Carson Flood Mitigation Plan mitigation measures still accurate for your jurisdiction? If not, what changes or additions would you make?
10. What mitigation measures do you want to see included in your jurisdiction's floodplain management ordinance/code?
11. For your jurisdiction specifically, what do you see as being necessary to implement the Carson River Hydraulic Model protocols and procedures?
12. How would you recommend that requirements for the Carson River Hydraulic Model protocols and procedures be inserted into your jurisdiction's floodplain management ordinance? Where in the ordinance/code?
13. How does your jurisdiction want to regulate the use of the Carson River Hydraulic Model to assess cumulative impacts of land use changes within the 1% and 0.2% chance floodplains?



14. Does your jurisdiction want to use the Carson River Hydraulic Model to assess project specific impacts of land use changes on adjacent, surrounding or other properties?
15. Does your jurisdiction want to use the Carson River Hydraulic Model to assess project specific impacts of land use changes as a means of mitigating any of the following items?
  - a. Flood hazards to downstream properties and communities
  - b. Loss of riparian habitat
  - c. Loss of floodplain function
  - d. Degradation of water quality
  - e. Other
16. Is your jurisdiction's floodplain management ordinance/code coordinated with the jurisdiction's adopted building codes?
17. Would your jurisdiction want to revise its floodplain management ordinance/code to be coordinated with the jurisdiction's adopted building codes?
18. What unique requirements does your jurisdiction have for revising its code, regulations, and standards?

## Appendix 2 – Generic Preliminary Draft Floodplain Management Ordinance Revision Language

### CARSON RIVER FLOODPLAIN HYDRAULIC MODELING:

#### A. Purpose:

It is the purpose of the Carson River Floodplain Hydraulic Modeling provisions to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions within the Carson River floodplain by requiring the use of the Carson River Hydraulic Model and procedures designed to:

1. Provide a consistent and complete tool to assess cumulative impacts of land use changes within the 1-percent chance (100-year) and 0.2-percent chance (500-year) floodplains;
2. Provide a consistent and complete tool to assess project specific impacts of land use changes within the 1-percent chance (100-year) and 0.2-percent chance (500-year) floodplains;
3. Provide a consistent and complete tool for mitigating flood hazards to downstream communities, loss of riparian habitat and floodplain function, and degradation of water quality due to impacts of land use changes within the 1-percent chance (100-year) and 0.2-percent chance (500-year) floodplains;
4. Provide consistent protocols, procedures, and guidance necessary to use the Carson River Hydraulic Model to evaluate impacts to floodplain extents, peak flow, peak flow timing, and flood volumes.

#### B. Definitions

1. “Carson River Hydraulic Model (Model)” is a single unified HEC-RAS model encompassing portions of the Carson River within Alpine County, California, Carson City, Nevada, Douglas County, Nevada and Lyon County, Nevada. The Model has its downstream terminus at Lahontan Reservoir, its upstream extent for the West Fork of the Carson River at approximately the USGS stream gage (10310000), West Fork Carson River At Woodfords, California, and its upstream extent for the East Fork of the Carson River at approximately the USGS stream gage (10309000), East Fork Carson River Near Gardnerville, Nevada.
2. “Carson River Hydraulic Model – Model Management, Distribution, and Update Guide (Guide)” is the document that provides guidance and procedures regarding the use, management, distribution, modification, submission, and review of the Model.

#### C. General Provisions.

1. The Model is hereby adopted as the hydraulic modeling/mapping tool to assess impacts of land use changes and development within the Carson River floodplain.
2. The Guide is hereby adopted as the required procedures and guidance for the use of the Model, including management, distribution, modification, submission and review.

3. Lands to which this Section Applies. This section shall apply to all areas of special flood hazards within the 1-percent chance (100-year) and 0.2-percent chance (500-year) floodplains of the Carson River within the jurisdiction of \_\_\_\_\_.

4. The most current version of the model shall be used to assess cumulative and project specific impacts of land use changes and development where a detailed hydrologic and hydraulic analyses and/or demonstration of the cumulative effect of the proposed land use changes or development are required by this code. The Model shall be used for the following:

- a. Technical analysis as set forth in subsection \_\_.\_\_. of this chapter.
- b. When there is no base flood elevation data available as set forth in subsection \_\_.\_\_. of this chapter.
- c. Additional technical analysis as set forth in subsection \_\_.\_\_, of this chapter.
- d. Use of other base data as set forth in subsection \_\_.\_\_. of this chapter.
- e. Interpretation of Flood Insurance Rate Map (FIRM) Boundaries as set forth in subsection \_\_.\_\_. of this chapter.
- f. For reviewing all proposals for new development as set forth in subsection \_\_.\_\_. of this chapter.
- g. For compliance with the provisions of subsection \_\_.\_\_, "Specific Standards For Flood Hazard Reduction" "Standards for Subdivisions."
- h. For compliance with the provisions of subsection \_\_.\_\_. "Specific Standards For Flood Hazard Reduction" "Floodways."
- i. For compliance with the provisions of and providing information for subsection \_\_.\_\_, "Variances procedures."
- j. For compliance with the provisions of and providing information for subsection \_\_.\_\_, "Map revision/amendment procedures."

5. All subdivision proposals and other proposed developments shall assess the cumulative and project specific impacts of land use changes and development through a detailed hydrologic and hydraulic analyses and/or demonstration of the cumulative effect of the proposed land use changes or development.

6. Use of the model shall be in conformance with the procedures and guidelines set forth in the most current version of the guide.

## Appendix 3 – Carson City Preliminary Draft Floodplain Management Ordinance Revision Language

Bill No. \_\_\_\_\_

Ordinance No. \_\_\_\_\_

**SUMMARY:** AN ORDINANCE AMENDING CARSON CITY MUNICIPAL CODE TITLE 12 – WATER, SEWERAGE AND DRAINAGE; BY AMENDING: CHAPTER 9 – FLOOD DAMAGE PREVENTION, REVISING SECTION 12.09.020 – DEFINITIONS, REVISING SECTION 12.09.040 – DECLARATION OF PURPOSE, REVISING SECTION 12.09.060 – GENERAL PROVISIONS, REVISING SECTION 12.09.080 – PROVISIONS FOR FLOOD HAZARD REDUCTION; ADDING PROVISIONS PERTAINING TO CARSON RIVER FLOODPLAIN HYDRAULIC MODELING; TO ESTABLISH THE HYDRAULIC MODELING/MAPPING TOOL, AND PROTOCOLS AND PROCEDURES TO BE USED TO ASSESS PROJECT AND CUMULATIVE IMPACTS OF LAND USE CHANGES WITHIN THE 1-PERCENT CHANCE (100-YEAR) AND 0.2-PERCENT CHANCE (500-YEAR) FLOODPLAIN OF THE CARSON RIVER; AND OTHER MATTERS PROPERLY RELATED THERETO.

**TITLE:** AN ORDINANCE AMENDING CARSON CITY MUNICIPAL CODE TITLE 12 – WATER, SEWERAGE AND DRAINAGE; BY AMENDING: CHAPTER 9 – FLOOD DAMAGE PREVENTION; AND OTHER MATTERS PROPERLY RELATED THERETO.

EXPLANATION – Matter in underlined bolded ***italics*** is new; matter with strikethrough text [~~omitted material~~] is to be omitted.

THE BOARD OF SUPERVISORS OF CARSON CITY, NEVADA DOES HEREBY ORDAIN:

**Section 1.** Carson City Municipal Code; Title 12 – Water, Sewerage And Drainage, Chapter 9 – Flood Damage Prevention, is hereby amended to revise the following sections:

Chapter 12.09 - FLOOD DAMAGE PREVENTION

Sections:

12.09.010 - Short title.

This chapter of the Carson City Municipal Code shall be shown and cited as the Carson City Flood Damage Prevention Ordinance.

12.09.020 - Definitions.

As used in this chapter:

1. "Accessory use" means a use which is incidental and subordinate to the principal use of the parcel of land on which it is located.
2. "Alluvial fan" is an area subject to flooding when the floodplain is comprised of low flow channels where sediment accompanies the shallow flooding and the unstable soils scour and erode during a flooding event.

3. "Alluvial fan flooding" means flooding occurring on the surface of an alluvial fan or similar land form which originates at the apex and is characterized by high-velocity flows: active processes of erosion, sediment transport, deposition, and unpredictable flow paths.
4. "Anchoring" means a series of methods used to secure a structure to its footings or foundation wall so that it will not be displaced by flood or wind forces.
5. "Apex" means the highest point on an alluvial fan or similar landform below which the flow path of the major stream that formed the fan becomes unpredictable and alluvial fan flooding can occur.
6. "Appeal" is a request for a review of the Local Floodplain Administrator's interpretation of any provision of this chapter or a request for a variance.
7. "Area of shallow flooding" is a designated AO Zone on the Flood Insurance Rate Map. The base flood depths range from one (1) to three (3) feet; a clearly defined map channel indeterminate; and, velocity flow may be evident. AO is characterized as sheet flow and AH indicates ponding.
8. "Base flood" is the flood having a one percent (1%) chance of being equaled or exceeded in any given year, also referred to as the "one hundred-year flood."
9. "Base flood elevation" (BFE) means the height in relation to mean sea level expected to be reached by the waters of the base flood at pertinent points in the floodplain of riverine areas.
10. "Basement" means any area of the building having its floor subgrade (below ground level) on all sides. A sub grade crawlspace is considered a basement unless it meets the minimum technical requirements defined in FEMA Technical Bulletin 11-01 (Crawlspace Construction for Buildings Located in Special Flood Hazard Areas, 2001).
11. "Building" - See structure.
12. "Carson River Hydraulic Model (Model)" means a single unified HEC-RAS model encompassing portions of the Carson River within Alpine County, California, Carson City, Nevada, Douglas County, Nevada and Lyon County, Nevada. The Model has its downstream terminus at Lahontan Reservoir, its upstream extent for the West Fork of the Carson River at approximately the USGS stream gage (10310000), West Fork Carson River At Woodfords, California, and its upstream extent for the East Fork of the Carson River at approximately the USGS stream gage (10309000), East Fork Carson River Near Gardnerville, Nevada.
13. "Carson River Hydraulic Model – Model Management, Distribution, And Update Guide (Guide)" means the document that provides guidance and procedures regarding the use, management, distribution, modification, submission and review of the Model.
- ~~14~~14. "Community" means any state or area or political subdivision thereof, or any Indian tribe or authorized tribal organization, or authorized native organization, which has authority to adopt and enforce flood plain management regulations for the areas within its jurisdiction.
- ~~13~~15. "Community rating system" (CRS) means a program developed by FIA to provide incentives for those communities in the Regular Program that have gone beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding.
- ~~14~~16. "Conditional letter of map amendment" (CLOMA) means a letter from FEMA stating that a proposed structure that is not to be elevated by fill would not be inundated by the base flood if built as proposed.
- ~~15~~17. "Conditional letter of map revision" (CLOMR) means procedures by which contractors, developers and communities can request review and determination by the Federal Insurance Administrator of scientific and technical data for a proposed project, when complete and functioning effectively would modify the elevation of individual structures and parcels of land, stream channels, and floodplains on the FIRM.
- ~~16~~18. "Conditional letter of map revision (based on fill)" (CLOMR-F) means a letter from FEMA stating that a parcel of land or proposed structure that is to be elevated by fill would not be inundated by the base flood if fill is placed on the parcel as proposed or the structure is built as proposed.

- 1719.** "Critical structures" means any structure for which even a slight chance of flooding would reduce or eliminate its designed function of supporting a community in an emergency. Fire stations, hospitals, municipal airports, police stations, communication antennas or towers, elder care facilities (retirement homes) fuel storage facilities, schools designated as emergency shelters, fresh water and sewage treatment facilities are some examples of critical structures.
- 1820.** "Date of construction" means the date that the building permit was issued provided the actual start of construction, repair, reconstruction, or improvement was within one hundred eighty (180) days of the permit date.
- 1921.** "Designated floodway" means the channel of a stream and the portion of the adjoining floodplain designated by a regulatory agency to be kept free of further development to provide for unobstructed passage of flood flows.
- 2022.** "Development" means any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials located within special flood hazard area.
- 2123.** "Digital flood insurance rate map" (DFIRM) means the official map, in digital format, on which the Federal Emergency Management Agency or Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community. The DFIRM is the legal equivalent of the FIRM in communities where a DFIRM is available (See Flood Insurance Rate Map).
- 2224.** "Dry floodproofing" means a floodproofing method used to design and construct buildings so as to prevent the entrance of floodwaters.
- 2325.** "Elevation certificate" means the elevation certificate is required in order to properly rate post-FIRM buildings, which are buildings constructed after publication of the Flood Insurance Rate Map (FIRM), for flood insurance Zones A1—A30, AE, AH, A (with BFE), VE, V1—V30, V (with BFE), AR, AR/A, AR/AE, AR/A1—A30, AR/AH, and AR/AO. The elevation certificate is not required for pre-FIRM buildings unless the building is being rated under the optional post-FIRM Flood insurance rules.
- 2426.** "Enclosure" means that portion of an elevated building below the lowest elevated floor that is either partially or fully shut-in by rigid walls.
- 2527.** "Encroachment" means the advance or infringement of uses, plant growth, excavation, fill, buildings, permanent structures or development, storage of equipment and materials, or any other physical object placed in the floodplain, that hinders the passage of water or otherwise affects flood flows.
- 2628.** "Existing manufactured home park or manufactured home subdivision" means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed before the effective date of the ordinance codified in this chapter.
- 2729.** "Expansion to an existing manufactured home park or manufactured home subdivision" is the preparation of additional sites by the construction of facilities for serving the lots on which the manufactured homes are to be affixed (including the installation of utilities, either final site grading or pouring of concrete pads, or the construction of streets).
- 2830.** "Federal Emergency Management Agency" (FEMA) is the federal agency under which the National Flood Insurance Program (NFIP) is administered.
- 2931.** "Federal Insurance Administration" (FIA) is the government unit, a part of Federal Emergency Management Agency (FEMA), that administers the National Flood Insurance Program (NFIP).
- 3032.** "Flash flood" means a flood that crests in a short period of time and is often characterized by high velocity flows. It is often the result of heavy rainfall in a localized area.

- 3133.** "Flood, flooding or flood waters" means a general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of floodwaters; the unusual and rapid accumulation or runoff of surface waters from any source and mudslides (i.e., mudflows) and the condition resulting from flood-related erosion.
- 3234.** "Flood control" means keeping flood waters away from specific developments or populated areas, areas by the construction of flood storage reservoirs, channel alterations, dikes and levees, bypass channels, or other engineering works.
- 3335.** "Flood Hazard Boundary Map" (FHBM) is an official map of a community, issued by the Administrator, where the boundaries of the flood, mudslide (i.e., mudflow) related erosion areas having special hazards have been designated as Zones A, M, and/or E.
- 3436.** "Flood Insurance Rate Map" (FIRM) is the official map on which the Federal Emergency Management Agency or Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community. Includes Digital Flood Insurance Rate Map (DFIRM) in communities where a DFIRM is available (See Digital Flood Insurance Rate Map).
- 3537.** "Flood Insurance Study" is the official report provided by the Federal Emergency Management Agency that includes flood profiles, the Flood Insurance Rate Map (FIRM), the Flood Boundary Floodway Map, and the water surface elevation of the base flood.
- 3638.** "Floodplain and flood-prone area" means any land area susceptible to being inundated by waters from any source. (also See Flood, flooding or flood waters).
- 3739.** "Floodplain management" is the operation of an overall program of corrective and preventive measures for reducing flood damage and preserving and enhancing, where possible, natural resources in the floodplain, including but not limited to emergency preparedness plans, flood control works and floodplain management plans, regulations and ordinances.
- 3840.** "Floodplain management regulations" means this chapter, and any federal, state or local regulations plus community zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as a grading and erosion control) and other applications of police power which control development in flood-prone areas to prevent and reduce flood loss and damage.
- 3941.** "Floodproofing" means any combination of structural and nonstructural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved property, water and sanitary facilities, structures and their contents. Refer to FEMA Technical Bulletins TB-1 (Openings in Foundation Walls and Walls of Enclosures, 2008), TB-3 (Non-residential Floodproofing - Requirements and Certification, 1993), and TB-7(Wet Floodproofing Requirements, 1993) for Guidelines on dry and wet floodproofing.
- 4042.** "Flood-related erosion" is a condition that exists in conjunction with a flooding event that alters the composition of the shoreline or bank of a watercourse. It is a condition that increases the possibility of loss due to the erosion of the land area adjacent to the shoreline or watercourse.
- 4143.** "Floodway" means the channel or a river or other watercourse and the adjacent land area that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than 0.99 foot.
- 4244.** "Flood Insurance Risk Zone Designations" are the zone designations indicating the magnitude of the flood hazard in specific areas of a community. See Special Flood Hazard Area.
- 4345.** "Zone A" means Special Flood Hazard Areas inundated by the one hundred-year flood; base flood elevations are not determined.
- 4446.** "Zone A1—30 and Zone AE" means Special Flood Hazard Areas inundated by the one hundred-year flood; base flood elevations are determined.

- 4547.** "Zone AO" means Special Flood Hazard Areas inundated by the one hundred-year flood; with flood depths of one (1) to three (3) feet (usually sheet flow on sloping terrain); average depths are determined. For areas of alluvial fan flooding, velocities are also determined.
- 4648.** "Zone AH" means Special Flood Hazard Areas inundated by the one hundred-year flood; flood depths of one (1) to three (3) feet (usually areas of ponding); base flood elevations are determined.
- 4749.** "Zone AR" means Special Flood Hazard Areas that result from the decertification of a previously accredited flood protection system that is in the process of being restored to provide a one hundred-year or greater level of flood protection.
- 4850.** "Zones AR/A1—30, AR/AE, AR/AH, AR/AO, and AR/A" means Special Flood Hazard Areas that result from the decertification of a previously accredited flood protection system that is in the process of being restored to provide a one hundred-year or greater level of flood protection. After restoration is complete, these areas will still experience residual flooding from other flooding sources.
- 4951.** "Zone A99" means Special Flood Hazard Areas inundated by the one hundred-year flood to be protected from the one hundred-year flood by a Federal flood protection system under construction; no base flood elevations determined.
- 5052.** "Zone B and Zone X (shaded)" means Areas of 500-year flood; areas subject to the one hundred-year flood with average depths of less than one (1) foot or with contributing drainage area less than one (1) square mile; and areas protected by levees from the base flood.
- 5153.** "Zone C and Zone X (unshaded)" means Areas determined to be outside the 500-year floodplain.
- 5254.** "Zone D" means Areas in which flood hazards are undetermined.
- 5355.** "Footing" means the enlarged base of a foundation wall, pier, or column, designed to spread the load of the structure so that it does not exceed the soil bearing capacity.
- 5456.** "Foundation" means the underlying structure of a building usually constructed of concrete that supports the foundation walls, piers, or columns.
- 5557.** "Foundation walls" means a support structure that connects the foundation to the main portion of the building or superstructure.
- 5658.** "Freeboard" means a margin of safety usually expressed in feet above a flood level for purposes of flood plain management. Freeboard tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed.
- 5759.** "Functionally dependent use" means a use which cannot perform its intended purpose unless it is located or carried out in close proximity to water. The term includes only marina facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and boat building and boat repair facilities, but does not include long-term storage or related manufacturing facilities.
- 5860.** "Governing body" means the local governing unit, county or municipality that is empowered to adopt and implement regulations to provide for public health, safety and general welfare of its citizenry.
- 5961.** "Hardship" is related to Variances of this chapter. The exceptional hardship would result from a failure to grant the requested variance. The Board of Supervisors requires the variance be exceptional, unusual, and pertain only to the property involved. Mere economic or financial hardship alone is not exceptional. Inconvenience, aesthetic considerations, physical handicaps, personal preferences, or the disapproval of one's neighbors likewise cannot, as a rule, qualify as an exceptional hardship. All of these problems can be resolved through other means without granting a variance, even if the alternative is more expensive, or requires the property owner to build elsewhere or put the parcel to a different use than originally intended.
- 6062.** "Highest adjacent grade" means the highest natural elevation of ground surface prior to construction next to the proposed walls of a structure or the highest ground surface next to the structure.



~~6163~~. "Historic structure" means any structure that is:

- a. Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
- b. Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;
- c. Individually listed on a State inventory of historic places in states with historic preservation programs which have been approved by the Secretary of Interior; or
- d. Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either by an approved State program as determined by the Secretary of the Interior or directly by the Secretary of the Interior in states without approved programs.

~~6264~~. "Hydrodynamic loads" are forces imposed on structures by floodwaters due to the impact of moving water on the upstream side of the structure, drag along its sides, and eddies or negative pressures on its downstream side.

~~6365~~. "Hydrostatic loads" are forces imposed on a flooded structure due to the weight of the water.

~~6466~~. "Letter of map amendment" (LOMA) is the procedure by which any owner or lessee of property who believes his property has been inadvertently included in a Special Flood Hazard Area can submit scientific and technical information to the Federal Insurance Administrator for review to remove the property from said area. The Administrator will not consider a LOMA if the information submitted is based on alteration of topography or new hydrologic or hydraulic conditions since the effective date of the FIRM.

~~6567~~. "Letter of map revision" (LOMR) is an official revision to a currently effective FIRM. A LOMR officially changes flood zone, floodplain and floodway designations, flood elevations and planimetric features.

~~6668~~. "Letter of map revision (based on fill)" (LOMR-F) is a letter from FEMA stating that an existing structure or parcel of land that has been elevated by fill would not be inundated by the base flood.

~~6769~~. "Levee" means a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control or divert the flow of water so as to provide protection from temporary flooding.

~~6870~~. "Lowest floor" means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access or storage, in an area other than a basement area, is not considered a building's lowest floor, provided that such enclosure does not violate applicable non-elevation design requirements.

~~6971~~. "Hazard mitigation plan" is a plan that incorporates a process whereby the potential of future loss due to flooding can be minimized by planning and implementing alternatives to floodplain management community-wide.

~~7072~~. "Manufactured home" (mobile home) means a structure, transportable in one (1) or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term "manufactured home" does not include "recreational vehicles".

~~7173~~. "Manufactured home park or subdivision" means a parcel or contiguous parcels of land divided into two (2) or more manufactured home lots for rent or sale.

~~7274~~. "Market value" is for the purposes of determining substantial improvement, market value pertains only to the structure in question. It does not pertain to the land, landscaping or detached accessory structures on the property. For determining improvement, the value of the land must always be subtracted.

Acceptable estimates of market value can be obtained from the following sources:

- a. Independent appraisals by a professional appraiser; or
- b. Detailed estimates of the structure's Actual Cash Value (used as a substitute for market value based on the preference of the community); or
- c. Property appraisals used for tax assessment purposes (Adjusted Assessed Value: used as a screening tool); or
- d. The value of buildings taken from NFIP claims data (used as a screening tool); or.
- e. "Qualified estimates" based on sound professional judgment made by staff of the local building department or local or State tax assessor's office.

As indicated above, some market value estimates should only be used as screening tools to identify those structures where the substantial improvement ratios are obviously less than or greater than fifty percent (50%) (e.g., less than forty percent (40%) or greater than sixty percent (60%)). For structures that fall between the forty percent (40%) and sixty percent (60%) range, more precise market value estimates should be used.

~~7375.~~ "Mobile home" has the same meaning as manufactured home.

~~7476.~~ "Natural grade" means the grade unaffected by construction techniques such as fill, landscaping, or berming.

~~7577.~~ "New construction" means structures for which the "start of construction" commenced on or after the effective date of the ordinance codified in this chapter.

~~7678.~~ "New manufactured home (mobile home) subdivision" means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads is completed on or after the effective date of these floodplain management regulation adopted by the Board of Supervisors.

~~7779.~~ "Non-residential" includes, but is not limited to: small business concerns, churches, schools, farm buildings (including grain bins and silos), poolhouses, clubhouses, recreational buildings, mercantile structures, agricultural and industrial structures, warehouses, and hotels or motels with normal room rentals for less than six (6) months duration.

~~7880.~~ "Obstruction" includes, but is not limited to, any dam, wall, wharf, embankment, levee, dike, pile, abutment, protection, excavation, channelization, bridge, conduit, culvert, building, wire, fence, rock, gravel refuse, fill, structure, vegetation or other material in, along, across or projecting into any watercourse which may alter, impede, retard or change the direction and or velocity of the flow of water, or due to its location, its propensity to snare or collect debris carried by the flow of water, or its likelihood of being carried downstream.

~~7981.~~ "One-hundred year-flood" has the same meaning as base flood.

~~8082.~~ "Physical map revisions" (PMR) is a reprinted NFIP map incorporating changes to floodplains, floodways, or flood elevations. Because of the time and cost involved to change, reprint, and redistribute an NFIP map, a PMR is usually processed when a revision reflects large scope changes.

~~8183.~~ "Ponding hazard" is a flood hazard that occurs in flat areas when there are depressions in the ground that collect "ponds" of water. The ponding hazard is represented by the zone designation AH on the FIRM.

~~8284.~~ "Post-FIRM construction" means construction or substantial improvement that started on or after the effective date of the initial Flood Insurance Rate Map (FIRM) of the community or after December 31, 1974, whichever is later.

~~8385.~~ "Pre-FIRM construction" means construction or substantial improvement which started on or before December 31, 1974 or before the effective date of the initial Flood Insurance Rate Map (FIRM) of the community, whichever is later.

- 8486.** "Principal residence" is a single family dwelling in which at the time of loss, the named insured or the named insured's spouse has lived for either (1) eighty percent (80) percent of the calendar year, or (2) eighty percent (80) percent of the period of ownership, if less than one (1) year.
- 8587.** "Proper openings for enclosures"(Applicable to Zones A, A1-A30, AE, AO, AH, AR, and AR Dual) relates to all enclosures below the lowest floor must be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. A minimum of two (2) openings, with positioning on at least two (2) walls, having a total net area of not less than one (1) square inch for every square foot of enclosed area subject to flooding must be provided.
- 8688.** "Public safety" relates to granting of a variance, the variance must not result in anything which is injurious to safety or to health of people, neighborhoods or community.
- 8789.** "Public nuisance" relates to any person that unlawfully obstructs the free passage or use, in the customary manner, of any navigable lake, or river, above or below ground channel, swale, stream, canal, or basin.
- 8890.** "Recreational vehicle" means a vehicle built on a single chassis, four hundred (400) square feet or less when measured at the largest horizontal projection, designed to be self-propelled or permanently towable by a light-duty track, and designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.
- 8991.** "Special Flood Hazard Area"(SFHA) is Darkly shaded area on a Flood Hazard Boundary Map (FHBM) or a Flood Insurance Rate Map (FIRM) that identifies an area that has a one percent (1%) chance of being flooded in any given year (one hundred-year floodplain). Over a thirty-year period, the life of most mortgages, there is at least a twenty-six percent (26%) chance that this area will be flooded. The FIRM identifies these shaded areas as FIRM Zones A, AO, AH, A1—A30, AE, A99, AR, AR/A, AR/AE, AR/A1—A30, AR/AH, AR/AO, V, V1—V30, and VE. See Flood Insurance Risk Zone Designations
- 9092.** "Start of construction" includes substantial improvement and other proposed new development and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, or other improvement was within one hundred eighty (180) days from the date of the permit. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation, or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading, and filling; nor does it include the installation of streets and or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.
- 9193.** "Structure" is a walled and roofed building or manufactured home that is principally above ground. A structure may be a gas or a liquid storage tank.
- 9294.** "Substantial damage" means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damage condition would equal or exceed fifty percent (50%) of the market value of the structure before the damage occurred.
- 9395.** "Substantial improvement" means any reconstruction, rehabilitation, addition, or other proposed new development of a structure, the cost of which equals or exceeds fifty percent (50%) of the market value of the structure before the "start of construction" of the improvement. This term includes structures which have incurred "substantial damage," regardless of the actual repair work performed. The term does not, however, include either;

- a. Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure a safe living conditions, or
- b. Any alteration of a "historic structure" provided that the alteration will not preclude the structure's continued designation as a "historic structure."

**9496.** "Variance" means a grant of relief from the requirements of this chapter which permits construction in a manner that would otherwise be prohibited by this chapter.

**9597.** "Violation" means the failure of a structure (new or substantially improved/damaged) or other development to be fully compliant with this chapter. A structure or other development in a special flood hazard area, without an elevation certificate, other certifications or other evidence of compliance required in this chapter is presumed to be in violation until such time as that documentation is provided.

**9698.** "Water surface elevation" means the height, in relation to the North American Vertical Datum (NAVD) of 1988, or (other datum, where specified) of floods of various magnitudes and frequencies in the floodplains of coastal or riverine areas.

**9799.** "Watercourse" means a lake, river, creek, stream, wash, arroyo, channel or other topographic feature on or over which waters flow at least periodically. Watercourse includes specifically designated areas in which substantial flood damage may occur.

**98100.** "2010 Carson City Control Network" means the record of survey map recorded on August 11, 2010, as map number 2749, document number 403435 in the office of Recorder, Carson City, Nevada.

**99101.** "Appeal Board" means the Board of Supervisors of Carson City.

#### 12.09.025 - Statutory authorization.

The legislature of the State of Nevada in Nevada Revised Statutes 278.020, 244A.057, and 543.020 confers upon local government units authority to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry. Therefore, the Board of Supervisors of Carson City does hereby adopt the following floodplain management regulations.

#### 12.09.030 - Findings of fact.

1. That the flood hazard areas of Carson City are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety and general welfare.
2. That these flood losses are caused by the cumulative effect of obstructions in areas of special flood hazards which increase flood heights and velocities, and when inadequately anchored, damage uses in other areas. Uses that are inadequately floodproofed, elevated or otherwise protected from flood damage also contribute to the flood loss.

#### 12.09.040 - Declaration of purpose.

It is the purpose of this chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

1. To protect human life and health;
2. To minimize expenditure of public money for costly flood-control projects;

3. To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
4. To minimize prolonged business interruptions;
5. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;
6. To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future blight areas;
7. To ensure that potential buyers are notified that property is in an area of special flood hazard; and
8. To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions; and
9. To maintain qualifying standards for participation in the National Flood Insurance Program.

*10. To minimize public and private losses due to flood conditions within the Carson River floodplain by requiring the use of the Carson River Hydraulic Model and procedures designed to:*

- a. Provide a consistent and complete tool to assess cumulative impacts of land use changes within the 1-percent chance (100-year) and 0.2-percent chance (500-year) floodplains;*
- b. Provide a consistent and complete tool to assess project specific impacts of land use changes within the 1-percent chance (100-year) and 0.2-percent chance (500-year) floodplains;*
- c. Provide a consistent and complete tool for mitigating flood hazards to downstream communities, loss of riparian habitat and floodplain function, and degradation of water quality due to impacts of land use changes within the 1-percent chance (100-year) and 0.2-percent chance (500-year) floodplains;*
- d. Provide consistent protocols, procedures, and guidance necessary to use the Carson River Hydraulic Model to evaluate impacts to floodplain extents, peak flow, peak flow timing, and flood volumes.*

12.09.050 - Methods of reducing flood losses.

In order to accomplish its purposes, this chapter includes methods and provisions for:

1. Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;
2. Requiring that land uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
3. Controlling the alteration of natural floodplains, stream channels and natural protective barriers, which help accommodate or channel floodwaters;
4. Controlling, filling, grading, dredging, and other development which may increase flood damage; and
5. Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

12.09.060 - General provisions.

The general provisions of this chapter are as follows:

1. Lands to which this Chapter Applies. This chapter shall apply to all areas of special flood hazards within the jurisdiction of Carson City.

2. Basis for Establishing the Areas of Special Flood Hazard. The areas of special flood hazard identified by the Federal Insurance Administration, through the Federal Emergency Management Agency in the Flood Insurance Study (FIS), with the accompanying Flood Insurance Rate Maps (FIRM), dated March 4, 1986 and all subsequent amendments and/or revisions, are hereby adopted by reference and declared to be a part of this chapter. The Flood Insurance Study is on file at the Development Services - Engineering for Carson City in its offices of record for public reference and review.
3. Compliance. No structure or land shall hereafter be constructed, located, extended, converted or altered without full compliance with the terms of this chapter and other applicable regulations. Violations of the provisions of this chapter by failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with conditions) shall constitute a misdemeanor. Any person who violates this chapter or fails to comply with any of its requirements shall upon conviction be guilty of a misdemeanor of each violation, and in addition shall pay all costs and expenses involved in the case. Nothing herein contained shall prevent Carson City from taking such other lawful actions as is necessary to prevent or remedy any violation.
4. Abrogation and Greater Restrictions. This chapter is not intended to repeal, abrogate or impair any existing easements, covenants or deed restrictions. However, where the ordinance codified in this chapter and another chapter, easement, covenant or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail.
5. Interpretation. In the interpretation and application of this chapter, all provisions shall be:
  - a. Considered as minimum requirements;
  - b. Liberally construed in favor of the governing body; and
  - c. Deemed neither to limit nor repeal any other powers granted under state statutes.
6. Warning and Disclaimer of Liability. The degree of flood protection required by this chapter is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man—made or natural causes. This chapter does not imply that land outside the areas of special flood hazards or uses permitted within such area will be free from flooding or flood damages. This chapter shall not create liability on the part of Carson City, any officer or employee thereof, or the Federal Insurance Administration, for any flood damages that result reliant on this chapter or any administrative decision lawfully made hereunder.
7. Declaration of Public Nuisance. Every new structure, building, fill, excavation or development located or maintained within any area of special flood hazard after March 4, 1986 is in violation of this chapter and considered a public nuisance per se and may be abated, prevented or restrained by action of this political subdivision.
8. Unlawful Acts. It is unlawful for any person to divert, retard or obstruct the flow of waters in any watercourse whenever it creates a hazard to life or property without securing the appropriate local, state and/or Federal permit(s). Any person violating the provisions of this section shall be guilty of a misdemeanor.
9. Severability. This chapter and the various parts thereof are hereby declared to be severable. Should any section of this ordinance be declared by the courts to be unconstitutional or invalid, such decisions shall not affect the validity of the chapter as a whole, or any portion thereof other than the section so declared to be unconstitutional or invalid.

10. Carson River Floodplain Hydraulic Modeling.

a. The Carson River Floodplain Hydraulic Model (Model) is hereby adopted as the hydraulic modeling/mapping tool to assess impacts of land use changes and development within the Carson River floodplain.

- b. The Carson River Hydraulic Model – Model Management, Distribution, And Update Guide (Guide) is hereby adopted as the required procedures and guidance for the use of the model, including management, distribution, modification, submission and review.*
- c. Lands to which the Carson River Floodplain Hydraulic Modeling Applies. The Carson River Floodplain Hydraulic Modeling shall apply to all areas of special flood hazards within the 1-percent chance (100-year) and 0.2-percent chance (500-year) floodplains of the Carson River within the jurisdiction of Carson City.*
- d. The most current version of the Model shall be used for the following:*
  - (1) Technical analysis as set forth in subsection 12.09.070 1f of this chapter.*
  - (2) When there is no base flood elevation data available as set forth in subsection 12.09.070 1g of this chapter.*
  - (3) Additional technical analysis as set forth in subsection 12.09.070 3a3, of this chapter.*
  - (4) Use of other base data as set forth in subsection 12.09.070 3b1 and 3b2 of this chapter.*
  - (5) Interpretation of Flood Insurance Rate Map (FIRM) Boundaries as set forth in subsection 12.09.070 e of this chapter.*
  - (6) For reviewing all proposals for new development as set forth in subsection 12.09.070 g of this chapter.*
  - (7) For compliance with the provisions of subsection 12.09.080 4f and 4g, "Specific Standards For Flood Hazard Reduction" "Standards for Subdivisions."*
  - (8) For compliance with the provisions of subsection 12.09.080 6a and 6b "Specific Standards For Flood Hazard Reduction" "Floodways."*
  - (9) For compliance with the provisions of and providing information for subsection 12.09.090, "Variances procedures."*
  - (10) For compliance with the provisions of and providing information for subsection 12.09.100, "Map revision/amendment procedures."*
- e. Use of the Model shall be in conformance with the procedures and guidelines set forth in the most current version of the Guide.*

#### 12.09.070 - Administration.

This chapter shall be administered as follows:

1. Establishment of Development Permit. A development permit shall be obtained before construction or development begins within any area of special flood hazard established pursuant to this chapter. The permit shall be for all structures including manufactured homes, and for all development including fill and other activities.

Application for a development permit shall be made on forms furnished by the Permit Center and may include, but not be limited to: plans in duplicate scale showing the nature, location, dimensions, and elevation of the area in question; existing or proposed structures, fill, storage of materials, drainage facilities; and the location of the foregoing. Specifically, the following information is required:

- a. Proposed elevation in relation to mean sea level, of the lowest floor (including basement) of all residential and non-residential structures whether new or substantially improved to be located in Zones A, A1—A30, AE, and AH, if base flood elevations data are available;
- b. Proposed elevation in relation to mean sea level to which any new or substantially improved non-residential structure will be floodproofed;



- c. Certification by a registered professional engineer or architect that the floodproofing methods for any nonresidential structure and/or any utility meets the floodproofing criteria;
  - d. Description of the extent to which any watercourse will be altered or relocated as a result of proposed development. When a watercourse will be altered or relocated as a result of the proposed development, the applicant must submit the maps, computations, and other materials required by the Federal Emergency Management Agency (FEMA) to process a Letter of Map Revision (LOMR) and pay any fees or other costs assessed by FEMA for processing the revision;
  - e. In Zone AO the proposed elevation in relation to mean sea level, of the lowest floor (including basement) and the elevation of the highest adjacent grade of all residential and non-residential structures whether new or substantially improved;
  - f. A technical analysis, by a professional engineer licensed in the State of Nevada, showing the proposed development located in the special flood hazard area will not cause physical damage to any other property; and
  - g. When there is no base flood elevation data available for Zone A from any source, the base flood elevation data will be provided by the permit applicant for all proposed development of subdivisions, manufactured home and recreational vehicle parks in the special flood hazard areas, for all developments of fifty (50) lots or five (5) acres, whichever is less.
  - h. Basis of elevation for floodplain analysis and certificates shall use the 2010 Carson City Control Network vertical data.
2. Designation of the Local Floodplain Administrator. The City Engineer or his designee is hereby appointed to administer and implement this chapter by granting or denying development applications in accordance with its provisions.
3. Duties and Responsibilities of the Administrator. The duties and responsibilities of the administrator shall include, but not be limited to:
- a. Permit Review.
    - (1) Review of development applications to determine that the requirements of this chapter have been satisfied;
    - (2) Review of all applications to determine that the site is reasonably safe from flooding;
    - (3) Review of all development applications to determine if the proposed development in the Special Flood Hazard Area may result in physical damage to any other property to include stream bank erosion and any increase in velocities or that it does not adversely affects the flood-carrying capacity of the area where base flood elevations have been determined but a floodway has not been designated. For purposes of this chapter, "adversely affected" means that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than 0.99 foot at any point. To assist the Local Floodplain Administrator in making this determination, the permit applicant may be required to submit additional technical analyses;
    - (4) Review of all proposals for the development of five (5) parcels or more to assure that the flood discharge exiting the development after construction is equal to or less than the flood discharge at the location prior to development;
    - (5) Review all development applications to determine that all necessary permits have been obtained from those federal, state, or local governmental agencies from which prior approval is required; and
    - (6) Verify that vertical elevations used for any analysis or certificate is from the 2010 Carson City Control Network vertical data.



- b. Use of Other Base Flood Data.
  - (1) When base flood elevation data has not been provided, the Local Floodplain Administrator shall obtain, review, and reasonably utilize the best base flood data available from any source: federal, state, or other; such as high water marks(s), floods of record, or private engineering reports, in order to administer this chapter and provide the developer with an estimated base flood elevation.
  - (2) Multiple parcels (five (5) or more) will be required to have all proposals establish the one hundred-year base flood elevation before consideration of the tentative plan for development. The Local Floodplain Administrator may, at his/her discretion, require standards exceeding those identified in this chapter. Any higher standards above those in this chapter shall be adopted by the Board of Supervisors.
- c. Information to be Obtained and Maintained. The Local Floodplain Administrator shall obtain and retain for public inspection and have available for the National Flood Insurance Program coordinator or the Federal Emergency Management Agency representative conducting a Community Assistance Visit, the following:
  - (1) Floodplain development permits and certificates of compliance.
  - (2) Elevation Certificates with record of certification required by for Lowest Floor Certification.
  - (3) Certifications required for Nonresidential Floodproofing.
  - (4) Elevation Certificates with record of certification required for Areas Below the Lowest Floor.
  - (5) Elevation Certificates with record of certification of elevation required for Subdivisions.
  - (6) Certification required for Floodways.
  - (7) Variances issued pursuant to Variance Procedures.
  - (8) Notices required under Alteration of Watercourses.
- d. Alteration of Watercourse. Prior to issuing a permit for any alteration or relocation of watercourse the Local Floodplain Administrator must:
  - (1) Notify all adjacent communities, Nevada's National Flood Insurance Program Coordinator, and submittal of evidence of such notification to the Federal Insurance Administration, and the Federal Emergency Management Agency;
  - (2) Determine that the potential permit recipient has provided for maintenance within the altered or relocated portion of said watercourse so that the flood carrying capacity is not diminished; and
  - (3) Have received a Conditional Letter of Map Revision (CLOMR) determination from FEMA.
  - (4) Provide funds from the Developer to the City for processing the Letter of Map Revision (LOMR).
- a. Funds shall be in United States currency.
- b. The amount of the funds shall be determined by an independent professional firm and shall include data collection, modeling, document research and preparation, FEMA processing fees, and filing of FEMA forms. The cost of the estimate will be split by the City and the Developer.
- c. Once the funds are agreed upon and collected by the City, there will be no further obligation from the Developer for the LOMR.
- e. Interpretation of Flood Insurance Rate Map (FIRM) Boundaries. The Local Floodplain Administrator or his designee may provide interpretations, where needed, as to the exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions).
- f. Maintenance of Flood Protection Measures. The maintenance of any and all flood protection measures (levees, dikes, dams, or reservoirs) will be required of the jurisdiction where such measures provide protection. If these measures are privately owned, an operation or maintenance plan will be required of

the owner to be on file with Development Services. Carson City is required to acknowledge all maintenance plans by the adoption of such plans by ordinance.

- g. Hazard Mitigation Plan. The planning commission and board of supervisors shall be responsible for reviewing all proposals for new development and shall weigh all requests for future floodplain development against the city's master plan. Consideration of the following elements is required before approval:
  - (1) Determination of whether or not a proposed development is in or affects a known floodplain.
  - (2) Inform the public of the proposed activity.
  - (3) Determine if there is a practicable alternative or site for the proposed activity.
  - (4) Identify impact of the activity on the floodplain.
  - (5) Provide a plan to mitigate the impact of the activity.
- h. Submission of New Technical Data to FEMA. When Carson City base flood elevations either increase or decrease resulting from physical changes affecting flooding conditions, as soon as practicable, but not later than six (6) months after the date such information becomes available, Carson City will submit the technical or scientific data to FEMA. Such submissions are necessary so that upon confirmation of the physical changes affecting flooding conditions, risk premium rates and flood plain management requirements will be based upon current data.

#### 12.09.080 - Provisions for flood hazard reduction.

- 1. Standards for Construction. In all areas of special flood hazard, the following standards are required:
  - a. Anchoring.
    - (1) All new construction and substantial improvements shall be anchored to prevent flotation, collapse or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy; and
    - (2) All manufactured homes shall meet the anchoring standards for Manufactured Homes.
  - b. Construction Materials and Methods.
    - (1) All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.
    - (2) All new construction and substantial improvements shall use methods and practices that minimize flood damage.
    - (3) All elements that function as a part of the structure, such as electrical, heating, ventilation, plumbing, air conditioning equipment and other service facilities shall be located so as to prevent water from entering or accumulating within the components during conditions of flooding.
    - (4) Within Zones AH or AO, improvements shall provide adequate drainage paths around structures on slopes to guide flood waters around and away from proposed structures.
  - c. Elevation Requirements for Lowest Floor
    - (1) In Zone AO, elevated above the highest adjacent grade to a height two (2) feet above the depth number specified in feet on the FIRM, or elevated at least three (3) feet above the highest adjacent grade if no depth number is specified.
    - (2) In Zone A, elevated two (2) feet above the base flood elevation, as determined by Local Floodplain Administrator.
    - (3) In all other zones, elevated at least two (2) feet above the base flood elevation.

- d. Lowest Floor Certification Requirements. Upon completion of the structure, the elevation of the lowest floor including basement shall be certified by a registered professional engineer or surveyor and verified by the community building inspector to be properly elevated. The certification shall be provided to the Floodplain Administrator using the current FEMA Elevation Certificate.
- e. Nonresidential Floodproofing Requirements. Nonresidential construction shall either be elevated to conform with Elevation Requirements for Lowest Floor or together with attendant utility and sanitary facilities;
  - (1) Will be floodproofed below the elevation recommended under Elevation Requirements for Lowest Floor so that the structure is watertight with walls substantially impermeable to the passage of water;
  - (2) Will have the structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and
  - (3) Will be certified by a registered professional engineer or architect that the standards of Elevation Requirements for Lowest Floor are satisfied. The certification shall be provided to the Local Floodplain Administrator.
- f. Requirements for Areas Below the Lowest Floor. All new construction and substantial improvements with fully enclosed areas below the lowest floor (excluding basements) that are usable solely for parking of vehicles, building access or storage, and which are subject to flooding, shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement shall follow the guidelines in FEMA Technical Bulletins TB-1 (Openings in Foundation Walls and Walls of Enclosures, 2008) and TB-7 (Wet Floodproofing Requirements, 1993) and must either be certified by a licensed professional engineer or architect to meet or exceed the following minimum criteria;
  - (1) Must have a minimum of two (2) openings having a total net area of not less than one (1) square inch for every square foot of enclosed area subject to flooding; and
  - (2) The bottom of all such openings will be no higher than one (1) foot above the lowest adjacent finished grade.

Openings may be equipped with louvers, valves, screens or other coverings or devices provided they permit the automatic entry and exit of floodwaters.

- 2. Standards for Alluvial Fans. Areas subject to alluvial-fan flooding have irregular flow paths that result in erosion of existing channels and the undermining of fill material. Those areas are identified on the Flood Insurance Rate Map (FIRM) as AO Zones with velocities.
  - a. All structures must be securely anchored to minimize the impact of the flood and sediment damage.
  - b. All new construction and substantial improvements must be elevated on pilings, columns, or armoured fill so that the bottom lowest floor beam is elevated at or above the depth number.
  - c. Use of all fill materials must be armoured to protect the material from the velocity of the flood flow.
  - d. All proposals for subdivision development must provide a mitigation plan that identifies the engineering methods used to:
    - (1) Protect structures from erosion and scour caused by the velocity of the flood flow;
    - (2) Capture or transport flood and sediment flow through the subdivision to a safe point of disposition.
  - e. All manufactured homes shall be prohibited within the identified hazard area except within existing manufactured home parks or subdivisions.
  - f. Approval by the director of public works is required.

## 3. Standards for Utilities.

- a. All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system.
- b. on-site waste disposal system shall be located to avoid impairment to them or contamination from them during flooding.
- c. All new and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters or discharge from the systems into flood waters. Sanitary sewer and storm drainage systems for buildings that have openings below the base flood elevation shall be provided with automatic backflow valves or other automatic backflow devices that are installed in each discharge line passing through a building's exterior wall

## 4. Standards for Subdivisions.

- a. All preliminary subdivision proposals shall identify the flood hazard area and the elevation of the base flood.
- b. All final subdivision plans will provide the elevation of proposed structure(s), pads, and adjacent grade. If the site is filled above the base flood, the final pad elevation shall be certified by a registered professional or surveyor and provided to the official as set forth in this chapter.
- c. All subdivision proposals shall be consistent with the need to minimize flood damage.
- d. All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage.
- e. All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage as set forth in this chapter. Certification of compliance shall be required of the developer and the project's engineer.
- f. Additionally all subdivision proposals will demonstrate, by providing a detailed hydrologic and hydraulic analyses that the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one (1) foot at any point within the Special Flood Hazard Area-

**g. All subdivision proposals and other proposed developments shall assess the project specific impacts of land use changes and development through a detailed hydrologic and hydraulic analyses and/or demonstration of the effect of the proposed land use changes or development on other properties.**

## 5. Standards for Manufactured Homes.

- a. All manufactured homes that are placed or substantially improved, within Zones A, AH, AE, and on the community's Flood Insurance Rate Map, on sites located:
  - (1) Outside of a manufactured home park or subdivision;
  - (2) In a new manufactured home park or subdivision;
  - (3) In an expansion to an existing manufactured home park or subdivision; or
  - (4) In an existing manufactured home park or subdivision on a site upon which a manufactured home has incurred "substantial damage" as a result of a flood:
- a. Shall be elevated on a permanent foundation so that the lowest floor will be elevated to or above the base flood elevation and be securely anchored to an adequately anchored foundation system to resist flotation, collapse and lateral movement. Methods of anchoring may include, but are not to be limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable State and local anchoring requirements for resisting wind forces.

- b. All manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or subdivision within Zones A, AH, and AE on the community's Flood Insurance Rate Map that are not subject to the provisions for the Standards for Critical Structures will be elevated so that either the:
    - (1) The bottom of structural frame or the lowest point of the manufactured home is at least two (2) feet above the base flood elevation; or
    - (2) The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than thirty-six (36) inches in height above grade plus freeboard and securely anchored to an adequately anchored foundation system to resist flotation, collapse, and lateral movement.
  - c. Within Zone A, when no base flood elevation data is available, new and substantially improved manufactured homes shall have the floor elevated at least three (3) feet above the highest adjacent grade.
  - d. Within Zone AO, the floor for all new and substantially improved manufactured homes will be elevated above the highest adjacent grade at least as high as the depth number specified on the Flood Insurance Rate Map, or at least two (2) feet if no depth number is specified. Upon the completion of the structure, the elevation of the lowest floor including basement shall be certified by a registered professional.
- 6. Floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters, which carry debris, potential projectiles, and erosion potential, the following provisions apply.
  - a. If a floodway has not been designated within the special flood hazard areas established in Basis for Establishing Areas of Special Flood Hazard, no new construction, substantial improvement, or other development (including fill) shall be permitted within Zones A1—30 and AE, unless it has been demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than 0.99 foot at any point within the community.
  - b. In designated floodways located within the special flood hazard areas established in Basis for Establishing Areas of Special Flood Hazard encroachment shall be prohibited, including fill, new construction, substantial improvements, storage of equipment or supplies, and any other development within the adopted regulatory floodway; unless it has been demonstrated through hydrologic and hydraulic analyses, performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge, and the Federal Emergency Management Agency has issued a Conditional Letter of Map Revision (CLOMR).
  - c. If the above "a and b" in Floodways have been satisfied; all proposed new development and substantial improvements will comply with all other applicable flood hazard reduction provisions of Provisions for Flood Hazard Reduction.
  - d. No manufactured homes shall be placed in a floodway except in existing manufactured home parks or existing manufactured home subdivisions.
- 7. Standards for Recreational Vehicles. All recreational vehicles placed on sites within the floodplain on the community's Flood Insurance Rate Map will either;
  - a. Be on the site for fewer than one hundred eighty (180) consecutive days;
  - b. Be fully licensed and ready for highway use. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions, or:
  - c. Will meet the permit requirements for Permit Application and the elevation and anchoring requirements for manufactured homes for Standards for Manufactured Homes.

8. Standards for Critical Structures. Critical structures are not authorized in a Special Flood Hazard Area, unless:
  - a. All alternative locations in Flood Zone X have been considered and rejected.
  - b. All alternative locations in Flood Zone Shaded X have been considered and rejected.

If the Local Floodplain Manager determines the only practical alternative location for the development of a new or substantially improved critical structure is in a Special Flood Hazard Area he must:

- a. Give public notice of the decision and reasons for the elimination of all alternative locations.
9. Protection of Floodplain Storage Capacity. Whenever any portion of a floodplain is authorized for use, the space occupied by the authorized fill or structure below the base flood elevation shall be compensated for and balanced by a hydraulically equivalent volume of excavation taken from below the base flood elevation. All such excavations shall be constructed to drain freely to the watercourse.

#### 12.09.090 - Variance procedures.

The variance procedures are as follows:

1. Nature of Variances. The variance criteria set forth in this chapter of the ordinance are based on the general principal of zoning law that variances pertain to a piece of property and are not personal in nature. A variance may be granted for a parcel of property with physical characteristics so unusual that complying with the requirements of this ordinance would create an exceptional hardship to the applicant or the surrounding property owners. The characteristics must be unique to the property and not be shared by adjacent parcels. The unique characteristic must pertain to the land itself, not to the structure, its inhabitants, or the property owners.

It is the duty of the Board of Supervisors to help protect its citizens from flooding. This need is so compelling and the implications of the cost of insuring a structure built below flood level are so serious that variances from the flood elevation or from other requirements in the flood ordinance are quite rare. The long-term goal of preventing and reducing flood loss and damage can only be met if variances are strictly limited. Therefore, the variance guidelines provided in this ordinance are more detailed and contain multiple provisions that must be met before a variance can be properly granted. The criteria are designed to screen out those situations in which alternatives other than a variance are more appropriate.

If, upon review, the Administrator of FEMA determines that community practices indicate a pattern of issuing variances that is inconsistent with the objectives of sound flood plain management, the community may be suspended from the National Flood Insurance Program.

2. Appeal Board.
  - a. The Board of Supervisors, as established by Title 18 of this code, shall hear and decide appeals and requests for variances from the requirements of this chapter.
  - b. The Board of Supervisors shall hear and decide appeals, if filed within thirty (30) days from any decision or determination, when it is alleged there is an error in any requirement, decision or determination made by the administrator of this chapter.
  - c. Those aggrieved by the decision of the Board of Supervisors may appeal such decision to the appropriate court as provided in the Nevada Revised Statutes.
  - d. In passing upon such applications, the Board of Supervisors shall consider all technical evaluations, all relevant factors, standards, etc., specified in other sections of this chapter, and:
    - (1) The danger that materials may be swept onto other lands to the injury of others;
    - (2) The danger to life and property due to flooding or erosion damage;

- (3) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
  - (4) The importance of the services provided by the proposed facility to the community;
  - (5) The necessity to the facility of a riverfront location, where applicable;
  - (6) The availability of alternative locations for the proposed uses that are not subject to flooding or erosion damage;
  - (7) The compatibility of the proposed use with existing and anticipated development;
  - (8) The relationship of the proposed use to the city's master plan and floodplain management program for that area;
  - (9) The safety of access to the property in times of flood for ordinary and emergency vehicles;
  - (10) The expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site;
  - (11) The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical and water system, and streets and bridges.
- e. Any applicant to whom a variance is granted shall be given written notice over the signature of a community official that;
- (1) The issuance of a variance to construct a structure below the base flood level will result in increased premium rates;
  - (2) Such construction below the base flood level increases risks to life and property. It is recommended that a copy of the notice shall be recorded by the Local Floodplain Administrator in the Office of the Carson City Recorder and shall be recorded in a manner so that it appears as an exception on the title of the affected parcel of land.
- f. The Local Floodplain Administrator will maintain a record of all variance actions, including justification for their issuance, and report such variances issued in its biennial report submitted to the Federal Insurance Administration, Federal Emergency Management Agency.
2. Conditions for Variances.
- a. Generally, variances may be issued for new construction, substantial improvements, and other proposed new development to be erected on a lot of one-half ( $\frac{1}{2}$ ) acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing that the procedures of Administration and Provisions for Flood Hazard Reduction of the ordinance have been fully considered. As the lot size increases beyond one-half ( $\frac{1}{2}$ ) acre, the technical justification required for issuing the variance increases.
  - b. Variances may be issued for the repair or rehabilitation of "historic structures," as defined in Definitions, upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as an historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.
  - c. Variances shall not be issued within any mapped regulatory floodway if any increase in flood levels during the base flood discharge would result.
  - d. Variances shall only be issued upon a determination that the variance is the "minimum necessary" considering the flood hazard, to afford relief. "Minimum necessary" means to afford relief with a minimum of deviation from the requirements of this ordinance. For example, in the case of variances to an elevation requirement, this means the Board of Supervisors need not grant permission for the applicant to build at grade, or even to whatever elevation the applicant proposed, but only to that elevation which the Board of Supervisors believes will both provide relief and preserve the integrity of the local ordinance.

- e. Variances shall only be issued upon:
  - (1) Showing of good and sufficient cause;
  - (2) A determination that failure to grant the variance would result in exceptional "hardship," as defined in Definitions, to the applicant;
  - (3) A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, or extraordinary public expense, create a nuisance, as defined in Definitions, "Public Safety/Nuisance"), cause fraud or victimization, as defined in Definitions of the public, or conflict with existing local laws or ordinances.
- f. Variances may be issued for new construction, substantial improvement, and other proposed new development necessary for the conduct of a functionally dependent use provided that the provisions of Conditions for Variances Sub-sections a through e are satisfied and that the structure or other development is protected by methods that minimize flood damages during the base flood and does not result in additional threats to public safety and does not create a public nuisance.
- g. Upon consideration of all the factors of Appeal Board and the purposes of this ordinance, the Board of Supervisors may attach such conditions to the granting of, variances as it deems necessary to further the purposes of this ordinance.

#### 12.09.100 - Map revision/amendment procedures.

1. Letter of Map Revision/Amendment. National Flood Insurance Program regulations provide procedures to remove property from the one hundred-year floodplain or from a Special Flood Hazard Area. Amendments and revisions to community Flood Insurance Rate Maps can not adversely impact the floodplain or floodway delineation's of the level of the one hundred-year flood.

There are several procedures provided whereby the Federal Insurance Administrator will review information from the community, an owner, or a lessee of property where it is believed the property should not be included in a Special Flood Hazard Area.

Submissions to FEMA for revisions to effective Flood Insurance Studies (FISs) by individual and community requesters will require the signing of application/certification forms. These forms will provide FEMA with assurance that all pertinent data relating to the revision is included in the submittal. They will also assure that: (a) the data and methodology are based on current conditions; (b) qualified professional have assembled data and performed all necessary computations; and (c) all individuals and organizations impacted by proposed changes are aware of the changes and will have an opportunity to comment on them. FEMA procedures permit the following types of request:

A request for a revision to the effective FIS information (FIRM, FBFM, and/or FIS report) is usually a request that FEMA replace the effective floodplain boundaries, flood profiles, floodway boundaries, etc., with those determined by the requester. Before FEMA will replace the effective FIS information with the revised information, the requester must: (a) provide all of the data used in determining the revised floodplain boundaries, flood profiles, floodway boundaries, etc.; (b) provide all data necessary to demonstrate that the physical modifications to the floodplain have been adequately designed to withstand the impacts of the one percent (1%) annual chance flood event and facilities will be adequately maintained; (c) demonstrate that the revised information (e.g., hydrologic and hydraulic analyses and the resulting floodplain and floodway boundaries) are consistent with the effective FIS information.

Requests for amendments or revisions to FEMA maps must be reviewed and submitted to FEMA by Carson City with the applicant for a map amendment or revision required to prepare all the supporting information and appropriate FEMA forms.

The scientific or technical information to be submitted with these requests may include, but is not limited to the following:

- a. An actual copy of the recorded plat map bearing the seal of the appropriate recordation official County Clerk or Recorder of Deeds indicating the official recordation and proper citation, Deed or Plat Book Volume



and Page Number, or an equivalent identification where annotation of the deed or plat book is not the practice.

- b. A topographical map showing;
  - (1) Ground elevation contours in relation to the NGVD (National Geodetic Vertical Datum).
  - (2) The total area of the property in question.
  - (3) The location of the structure or structures located on the property in question.
  - (4) The elevation of the lowest adjacent grade to a structure or structures.
  - (5) An indication of the curvilinear line which represents the area subject to inundation by a base flood. The curvilinear line should be based upon information provided by an appropriate authoritative source, such as a Federal Agency, Department of Water Resources, a County Water Control District, a County or City Engineer, a Federal Emergency Management Agency Flood Insurance Study, or a determination by a Registered Professional Engineer.
- c. A copy of the FHBM or FIRM indicating the location of the property in question.
- d. A certification by a Registered Professional Engineer or Licensed Land Surveyor that the lowest grade adjacent to the structure is above the base flood elevation.
- e. The completion of the appropriate forms in the Federal Emergency Management Agency's Packets, Amendments and Revisions To National Flood Insurance Program Maps (MT-1 FEMA FORM 81-87 Series and MT-2 FEMA FORM 81-89 Series).

**Section 2.** If any section of this ordinance or portion thereof is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such holding shall not invalidate the remaining parts of this ordinance.

**Section 3.** All ordinances, parts of ordinances, chapters, sections, subsections, clauses, phrases or sentences contained in the Carson City Municipal Code in conflict herewith are hereby repealed.

**Section 4.** This ordinance shall be in full force and effect from and after its passage, approval, and publication as required by law.

THIS RESOLUTION was proposed on the \_\_\_\_ day of \_\_\_\_\_, 201\_ by the following City Supervisor(s):

\_\_\_\_\_.

THIS RESOLUTION has been PASSED, ADOPTED and APPROVED this \_\_\_\_ day of \_\_\_\_\_, 201\_ by the following vote of the Board of Supervisors, Carson City:

AYES:

\_\_\_\_\_

NAYS:

\_\_\_\_\_

ABSENT:

\_\_\_\_\_

ABSTENTIONS:

\_\_\_\_\_

Board of Supervisors  
Carson City

\_\_\_\_\_  
By: Chairman

Attest:

\_\_\_\_\_  
City Clerk

## Appendix 4 – Lyon County Preliminary Draft Floodplain Management Ordinance Revision Language

Bill No. \_\_\_\_\_

Ordinance No. \_\_\_\_\_

**SUMMARY:** AN ORDINANCE AMENDING LYON COUNTY CODE TITLE 12 – FLOOD CONTROL; BY AMENDING: CHAPTER 1 – FLOOD DAMAGE PREVENTION, REVISING SECTION 12.01.03 – PURPOSE, REVISING SECTION 5 – DEFINITIONS, REVISING SECTION 12.01.07 – BASIS FOR ESTABLISHING AREAS OF SPECIAL FLOOD HAZARD, INFORMATION MAINTAINED, REVISING SECTION 12.01.12 – GENERAL STANDARDS FOR FLOOD HAZARD REDUCTION; ADDING PROVISIONS PERTAINING TO CARSON RIVER FLOODPLAIN HYDRAULIC MODELING; TO ESTABLISH THE HYDRAULIC MODELING/MAPPING TOOL, AND PROTOCOLS AND PROCEDURES TO BE USED TO ASSESS PROJECT AND CUMULATIVE IMPACTS OF LAND USE CHANGES WITHIN THE 1-PERCENT CHANCE (100-YEAR) AND 0.2-PERCENT CHANCE (500-YEAR) FLOODPLAIN OF THE CARSON RIVER; AND OTHER MATTERS PROPERLY RELATED THERETO.

**TITLE:** AN ORDINANCE AMENDING LYON COUNTY CODE TITLE 12 – FLOOD CONTROL; BY AMENDING: CHAPTER 1 – FLOOD DAMAGE PREVENTION; AND OTHER MATTERS PROPERLY RELATED THERETO.

EXPLANATION – Matter in underlined bolded ***italics*** is new; matter with strikethrough text [~~omitted material~~] is to be omitted.

THE BOARD OF COUNTY COMMISSIONERS OF LYON COUNTY, NEVADA DOES HEREBY ORDAIN:

**Section 1.** Lyon County Code; Title 12 – Flood Control, Chapter 1 – Flood Damage Prevention, is hereby amended to revise the following sections:

12.01.03: Purpose:

It is the purpose of this chapter to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

- A. To protect human life and health;
- B. To minimize expenditure of public money for costly flood control projects;
- C. To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- D. To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;
- E. To ensure that potential buyers are notified that property is in an area of special flood hazard;
- F. To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions; and
- G. To maintain eligibility for state and federal disaster relief.

H. To minimize public and private losses due to flood conditions within the Carson River floodplain by requiring the use of the Carson River Hydraulic Model and procedures designed to:

1. Provide a consistent and complete tool to assess cumulative impacts of land use changes within the 1-percent chance (100-year) and 0.2-percent chance (500-year) floodplains;
2. Provide a consistent and complete tool to assess project specific impacts of land use changes within the 1-percent chance (100-year) and 0.2-percent chance (500-year) floodplains;
3. Provide a consistent and complete tool for mitigating flood hazards to downstream communities, loss of riparian habitat and floodplain function, and degradation of water quality due to impacts of land use changes within the 1-percent chance (100-year) and 0.2-percent chance (500-year) floodplains;
4. Provide consistent protocols, procedures, and guidance necessary to use the Carson River Hydraulic Model to evaluate impacts to floodplain extents, peak flow, peak flow timing, and flood volumes.

12.01.05: DEFINITIONS:

Certain words and terms used herein are defined, for the purpose of this chapter, as provided in this section.

Unless specifically defined in this section, words or phrases used in this chapter shall be interpreted so as to give them the meanings they have in common usage and to give its most reasonable application.

ALLUVIAL FAN FLOODING: Flooding occurring on the surface of an alluvial fan or similar landform which originates at the apex and is characterized by high velocity flows; active processes of erosion, sediment transport, deposition, and unpredictable flow paths.

APPEAL: A request for a review of an administrative determination or department interpretation of any provision of this chapter or a request for a variance.

AREA OF SHALLOW FLOODING: A designated A, AO or AH zone on the flood insurance rate map (FIRM). The base flood depths range from one foot (1') to three feet (3'); a clearly defined channel does not exist, the path of flooding is unpredictable and indeterminate and velocity flow may be evident.

AREA OF SPECIAL FLOOD HAZARD: The land in the floodplain within a community subject to a one percent (1%) or greater chance of flooding in any given year.

BASE FLOOD: The flood having a one percent (1%) chance of being equaled or exceeded in any given year. Also referred to as the "100-year flood". Designation on maps always includes the letters A or V.

BASEMENT: Any area of the building having its floor subgrade (below ground surface) on all sides.

CARSON RIVER HYDRAULIC MODEL (Model) is a single unified HEC-RAS model encompassing portions of the Carson River within Alpine County, California, Carson City, Nevada, Douglas County, Nevada and Lyon County, Nevada. The Model has its downstream terminus at Lahontan Reservoir, its upstream extent for the West Fork of the Carson River at approximately the USGS stream gage (10310000), West Fork Carson River At Woodfords, California, and its upstream extent for the East Fork of the Carson River at approximately the USGS stream gage (10309000), East Fork Carson River Near Gardnerville, Nevada.

CARSON RIVER HYDRAULIC MODEL – MODEL MANAGEMENT, DISTRIBUTION, AND UPDATE GUIDE (Guide) is the document that provides guidance and procedures regarding the use, management, distribution, modification, submission, and review of the model.

CRAWL SPACE: Unfinished accessible area below the first floor of a structure. Height ranges from approximately one foot six inches (1'6") to four feet zero inches (4'0"). Commonly used for components such as ductwork and piping.

DEVELOPMENT: Any manmade change to improved or unimproved real estate including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, or storage or equipment or materials located within the area of special flood hazard.

FLOOD INSURANCE RATE MAP (FIRM): The official map on which the federal insurance administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.

FLOOD INSURANCE RISK ZONE DESIGNATIONS: The zone designations indicate the magnitude of the flood hazard in specific areas of a community.

Zone A: Special flood hazard areas with a one percent (1%) annual chance of flooding and a twenty six percent (26%) chance of flooding over the life of a thirty (30) year mortgage; base flood elevations are not determined.

Zone A1-30 And Zone AE: Special flood hazard areas with a one percent (1%) annual chance of flooding and a twenty six percent (26%) chance of flooding over the life of a thirty (30) year mortgage; base flood elevations are determined.

Zone A99: Special flood hazard areas with a one percent (1%) or greater chance of flooding each year to be protected by a federal flood protection system under construction; no base flood elevations are determined.

Zone AH: Special flood hazard areas with a one percent (1%) or greater chance of shallow flooding each year, flood depths of one to three feet (3') (usually areas of ponding); base flood elevations are determined.

Zone AO: Special flood hazard areas with a one percent (1%) or greater chance of shallow flooding each year, with flood depths of one to three feet (3') (usually sheet flow on sloping terrain); average depths are determined. For areas of alluvial fan flooding, velocities are also determined.

Zone AR: Special flood hazard areas that result from the decertification of a previously accredited flood protection system that is in the process of being restored to provide a 100-year or greater level of flood protection.

Zone B And Zone X (Shaded): Areas of one percent (1%) annual chance sheet flow flooding where average depths are less than one foot (1'), areas of one percent (1%) annual chance flooding where the contributing drainage is less than one square mile, or areas protected from the one percent (1%) annual chance flood by levees.

Zones AR/A1-30, AR/AE, AR/AH, AR/AO, And AR/A: Special flood hazard areas that result from the decertification of a previously accredited flood protection system that is in the process of being restored to provide a 100-year or greater level of flood protection. After restoration is complete, these areas will still experience residual flooding from other flooding sources.

Zones C And X (Unshaded): Areas determined to be outside the 500-year floodplain.

FLOOD INSURANCE STUDY: The official report provided by the federal insurance administration that includes flood profiles, the flood boundary-floodway map and the water surface elevation of the base flood.

FLOOD OR FLOODING: A general and temporary condition of partial or complete inundation of normally dry land areas from:

- A. The overflow of inland or tidal waters; and/or

- B. The unusual and rapid accumulation of runoff or surface waters from any source.

**FLOOD RELATED EROSION:** A condition that exists in conjunction with a flooding event that alters the composition of the shoreline or bank of a watercourse; one that increases the possibility of loss due to the erosion of the land area adjacent to the shoreline or watercourse.

**FLOODPLAIN ADMINISTRATOR:** The individual given specific authority and responsibilities to enforce this chapter, specifically the planning director.

**FLOODPROOFING:** Any combination of structural and nonstructural additions, changes or adjustments to nonresidential structures which reduce or eliminate flood damage to real estate or improved property.

**FLOODWAY:** The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot (1').

**HARDSHIP:** The exceptional hardship that would result from a failure to grant the requested variance. The board of county commissioners requires that the variance be exceptional, unusual, and peculiar to the property involved. Mere economic or financial hardship alone is not considered exceptional. Inconvenience, aesthetic considerations, physical handicaps, personal preferences, or the disapproval of one's neighbors likewise cannot, as a rule, qualify as an exceptional hardship. All of these problems can be resolved through other means without granting a variance, even if the alternative is more expensive, or requires the property owner to build elsewhere or put the parcel to a different use than originally intended.

**HAZARD MITIGATION PLAN:** A plan that incorporates a process whereby the potential of future loss due to flooding can be minimized by planning and implementing alternatives to floodplain development community wide.

**HIGHEST GRADE:** The highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

**LETTER OF MAP AMENDMENT (LOMA):** The procedure by which any owner or lessee of property who believes his property has been inadvertently included in a special flood hazard area can submit scientific and technical information to the federal insurance administrator for review to remove the property from said area. The administrator will not consider a LOMA if the information submitted is based on alteration of topography or new hydrologic or hydraulic conditions since the effective date of the FIRM.

**LETTER OF MAP REVISION (BASED ON FILL) (LOMR-F):** A letter from FEMA stating that an existing structure or parcel of land that has been elevated by fill would not be inundated by the base flood.

**LETTER OF MAP REVISION (LOMR):** An official revision to a currently effective FIRM. ~~A An~~ LOMR officially changes flood zone, floodplain and floodway designations, flood elevations and planimetric features.

**LEVEE:** A manmade structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control or divert the flow of water so as to provide protection from temporary flooding.

**LOWEST FLOOR:** The lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; provided, it conforms to the applicable nonelevation design requirements of this chapter found at section 12.01.13 of this chapter, including, but not limited to:

The wet floodproofing standard in subsection 12.01.13A of this chapter;

The anchoring standards in subsection 12.01.12B of this chapter;

The construction materials and methods standards in subsections 12.01.12C1 and C2 of this chapter; and

The utilities standards in subsection 12.01.12C3 of this chapter.

**MANUFACTURED HOME:** A structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For floodplain management purposes, the term "manufactured home" also includes park trailers, travel trailers and other similar vehicles placed on a site for greater than one hundred eighty (180) consecutive days. For insurance purposes, the term "manufactured home" does not include park trailers, travel trailers and other similar vehicles.

**MANUFACTURED HOME PARK OR SUBDIVISION:** A parcel (or contiguous parcels) of land divided into two (2) or more manufactured home lots for rent or sale.

**NEW CONSTRUCTION:** Structures for which the "start of construction" commenced on or after November 5, 1987, the effective date of floodplain management regulations adopted by the county.

**RECREATIONAL VEHICLE:** A vehicle which is built on a single chassis; four hundred (400) square feet or less when measured at the largest horizontal projection; designed to be self-propelled or permanently towable by a light duty truck; designed to be used as temporary living quarters for recreational, camping, travel or seasonal use.

**SAND DUNES:** Naturally occurring accumulations of sand in ridges or mounds landward of the beach.

**SPECIAL FLOOD HAZARD AREA:** An area in the floodplain subject to a one percent (1%) or greater chance of flooding in any given year. It is shown on the FIRM as zone A, AO, A1-30, AE, A99, AH or AR.

**START OF CONSTRUCTION:** Includes substantial improvement and means the date the building permit was issued; provided, the actual start of construction, repair, reconstruction, placement or other improvement was within one hundred eighty (180) days of the permit date. The "actual start" means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns or any work beyond the stage of excavation, or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling nor does it include the installation of streets and/or walkways nor does it include the installation on the property of accessory buildings such as garages or sheds not occupied as dwelling units or not part of the main structure.

**STRUCTURE:** A walled and roofed building, including a gas or liquid storage tank, that is principally aboveground.

**SUBSTANTIAL DAMAGE:** Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed fifty percent (50%) of the market value of the structure before the damage occurred.

**SUBSTANTIAL IMPROVEMENT:** A. Any repair, reconstruction, rehabilitation, addition or other proposed new development of a structure, the cost of which equals or exceeds fifty percent (50%) of the market value of the structure either:

1. Before the improvement or repair is started, or
2. If the structure has been damaged and is being restored, before the damage occurred. For the purposes of this definition, "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure.

B. "Substantial improvement" does not, however, include either:

1. Any project for improvement of a structure to comply with existing state or local health, sanitary or safety code specifications which are solely necessary to assure safe living conditions, or
2. Any alteration of a structure listed on the national register of historic places or a state inventory of historic places.

VARIANCE: A grant of relief from the requirements of this chapter which permits construction in a manner that would otherwise be prohibited hereof.

VIOLATION: Failure of a structure or other development to be fully compliant with the county floodplain management regulation. A structure or other development without an elevation certificate or other certifications, or other evidence of compliance as required in this chapter is presumed in violation until such time as that documentation is provided.

WATERCOURSE: A lake, river, creek, stream, wash, arroyo, channel, irrigation canal or other topographic feature on or over which waters flow at least periodically. Watercourse includes specifically designated areas in which substantial flood damage may occur.

#### 12.01.06: INTERPRETATION, APPLICATION AND COMPLIANCE:

A. This chapter shall apply to all areas of special flood hazards within the jurisdiction of the county.

B. In the interpretation and application of this chapter, all provisions shall be:

1. Considered as minimum requirements;
2. Construed in favor of the governing body to promote public health, safety and welfare; and
3. Deemed neither to limit nor repeal any other powers granted under state statutes or local ordinance.

C. This chapter is not intended to repeal, abrogate or impair any existing easements, covenants or deed restrictions. However, where this chapter and another ordinance, easement, covenant or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

D. No structure or land shall hereafter be constructed, located, extended, converted or altered without full compliance with the terms of this chapter and other applicable regulations. Violations of this requirement (including violations of conditions and safeguards established in connection with conditions) shall constitute a misdemeanor.

E. After discovery of a violation or alleged violation of this chapter, the floodplain administrator shall take action to verify the existence of a violation(s) and remedy the violation(s) through administrative means including stop work orders or other provisions of this code or applicable laws. If a property owner fails to remedy any violation of this chapter, the administrator may submit a report to the governing body which shall include all information available to the floodplain administrator which is pertinent to said violation, and request that the governing body:

1. Take any necessary action to effect the abatement of such violation; or
2. Issue a variance to this chapter in accordance with the provisions of section 12.01.14 of this chapter; or
3. Submit to the administrator of federal insurance administration a declaration for denial of insurance, stating that the property is in violation of a cited statute or local law, regulation or ordinance, pursuant to section 1316 of the national flood insurance act of 1968, as amended.



## 12.01.07: BASIS FOR ESTABLISHING AREAS OF SPECIAL FLOOD HAZARD; INFORMATION MAINTAINED:

- A. Flood Insurance Study And Maps: The areas of special flood hazard identified by the federal insurance administration in a scientific and engineering report entitled "The Flood Insurance Study For Lyon County", dated January 19, 1982, with accompanying flood insurance maps, and all subsequent revisions is hereby adopted by reference and declared to be a part of this chapter. The flood insurance study is on file at the Lyon County planning department, 27 South Main Street, Yerington, NV 89447.

Interpretations, where needed, as to location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions) shall be made by the floodplain administrator. The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in section 12.01.14 of this chapter.

- B. Use Of Other Base Flood Data: When base flood elevation data has not been provided in accordance with subsection A of this section, the floodplain administrator shall obtain, review and reasonably utilize any base flood elevation and floodway data available from a federal, state or other source in order to administer sections 12.01.12 and 12.01.13 of this chapter.

- C. Information Obtained And Maintained:

1. Where base flood elevation data is provided through the flood insurance study or acquired as in subsection B of this section, the actual elevation (in relation to mean sea level) of the lowest floor (including basement) of all new or substantially improved structures and whether or not the structure contains a basement shall be obtained and recorded.
2. For all new or substantially improved floodproofed structures:
  - a. The actual elevation (in relation to mean sea level) shall be verified and recorded; and
  - b. The floodproofing certifications required in subsection 12.01.08B of this chapter shall be maintained.
3. All records pertaining to the provisions of this chapter shall be maintained for public inspection.

*D. Carson River Floodplain Hydraulic Modeling.*

- 1. The Carson River Floodplain Hydraulic Model (Model) is hereby adopted as the hydraulic modeling/mapping tool to assess impacts of land use changes and development within the Carson River floodplain.*
- 2. The Carson River Hydraulic Model – Model Management, Distribution, And Update Guide (Guide) is hereby adopted as the required procedures and guidance for the use of the model, including management, distribution, modification, submission and review.*
- 3. Lands to which the Carson River Floodplain Hydraulic Modeling Applies. The Carson River Floodplain Hydraulic Modeling shall apply to all areas of special flood hazards within the 1-percent chance (100-year) and 0.2-percent chance (500-year) floodplains of the Carson River within the jurisdiction of Lyon County.*
- 4. The most current version of the Model shall be used for the following:*
  - a. Interpretations as set forth in subsection 12.01.07A of this chapter.*
  - b. Use Of Other Base Data as set forth in subsection 12.01.07B of this chapter.*

- c. For information for the application of a development permit as required in subsections 12.01.08B6, B7 and B8 of this chapter.*
  - d. For the issuing of a permit for any alteration of a watercourse as set forth in subsection 12.01.09 of this chapter.*
  - e. For compliance with the provisions of subsection 12.01.12A of this chapter.*
  - f. For compliance with the provisions of subsection 12.01.13D1, "Specific Standards For Flood Hazard Reduction."*
  - g. For compliance with the provisions of and providing information for subsection 12.01.14C, "Variances and Appeals."*
  - h. For compliance with the provisions of and providing information for subsection 12.01.15, "Letters Of Map Revision/Amendment."*
- 5. Use of the Model shall be in conformance with the procedures and guidelines set forth in the most current version of the Guide.*

12.01.08: DEVELOPMENT PERMIT:

- A. Permit Required: A development permit shall be obtained before construction or development begins within any area of special flood hazard established in subsection 12.01.07A of this chapter. The permit shall be for all structures, including manufactured homes as defined in section 12.01.05 of this chapter, and for all development, including fill and other activities, also as defined in section 12.01.05 of this chapter.
- B. Application For Permit: The applicant shall provide at least the following information, where applicable. Additional information may be required as determined by the floodplain administrator.
1. The proposed elevation in relation to mean sea level, of the lowest floor (including basement) of all residential and nonresidential structures whether new or substantially improved to be located in zones A, A1-A30, AE, and AH, if base flood elevations data are available.
  2. In zone AO the proposed elevation in relation to the elevation of the highest adjacent grade of all residential and nonresidential structures whether new or substantially improved.
  3. The proposed elevation in relation to mean sea level, to which any new or substantially improved nonresidential structure will be floodproofed.
  4. A certificate from a licensed professional engineer or architect in the state of Nevada that any utility floodproofing meets the criteria in subsection 12.01.12D, "Utilities", of this chapter.
  5. A certificate from a licensed professional engineer or architect in the state of Nevada that any nonresidential floodproofed structures meet the criteria in sections 12.01.12 and 12.01.13 of this chapter.
  6. When a watercourse will be altered or relocated as a result of the proposed development, the applicant must submit the maps, computations, and other materials required by the federal emergency management agency (FEMA) to process a letter of map revision (LOMR) and pay any fees or other costs assessed by FEMA for processing the revision.
  7. A technical analysis, by a professional engineer licensed in the state of Nevada, showing the proposed development located in the special flood hazard area will not cause physical damage to any other property.

8. When there is no base flood elevation data available for zone A from any source, the base flood elevation data will be provided by the permit applicant for all proposed development of subdivisions, manufactured home and recreational vehicle parks in the special flood hazard areas, for all developments of fifty (50) lots or five (5) acres, whichever is less.

C. Permit Review And Approval: The planning administrator is appointed floodplain administrator to administer and implement this chapter by granting or denying development permit applications in accordance with its provisions.

Duties and responsibilities of the floodplain administrator shall include, but not be limited to:

1. Review all development permits to determine that the permit requirements of this chapter have been satisfied.
2. Review all development permits to determine that all necessary permits have been obtained from those federal, state or local governmental agencies from which prior approval is required.
3. Review all permits to determine that the structure(s) is reasonably safe from flooding.

#### 12.01.09: ALTERATION OF WATERCOURSES:

Prior to issuing a permit for any alteration or relocation of watercourse the floodplain administrator must:

- A. Have processed and received a letter of map revision (LOMR).
- B. Notify all adjacent communities, Nevada's national flood insurance program coordinator, and submittal of evidence of such notification to the federal insurance administration, and the federal emergency management agency.
- C. Determine that the potential permit recipient has provided for maintenance within the altered or relocated portion of said watercourse so that the flood carrying capacity is not diminished.

#### 12.01.10: RETAINING FLOODPLAIN DEVELOPMENT DOCUMENTATION:

The floodplain administrator shall obtain and retain for public inspection and have available for the national flood insurance program coordinator or the federal emergency management agency representative conducting a community assistance visit, the following:

- A. Floodplain development permits and certificates of compliance.
- B. Certification required by section 12.01.13 of this chapter (lowest floor elevation).
- C. Certification required by section 12.01.13 of this chapter (floodproofing nonresidential structures).
- D. Certification of elevation required by section 12.01.12 of this chapter (subdivision standards).
- E. Certification required by section 12.01.13 of this chapter (floodway encroachments).
- F. Variances issued pursuant to section 12.01.14, "Variances And Appeals", of this chapter.
- G. Notices required under section 12.01.09, "Alteration Of Watercourses", of this chapter.

## 12.01.11: MAINTENANCE OF FLOOD PROTECTION MEASURES:

The maintenance of any and all flood protection measures (levees, dikes, dams or reservoirs) will be required of the jurisdiction where such measures provide protection. If these measures are privately owned, an operation or maintenance plan will be required of the owner to be on file with the planning department.

## 12.01.12: GENERAL STANDARDS FOR FLOOD HAZARD REDUCTION:

In all areas of special flood hazards, the following standards are required:

## A. Development Requirements:

1. All subdivision proposals shall be consistent with the need to minimize flood damage;
2. All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage;
3. All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage; certification of compliance shall be required of the developer; ~~and~~
4. Where base flood elevation data has not been provided or is not available from another authoritative source, it shall be generated for subdivisions and other proposed developments which contain at least fifty (50) lots or five (5) acres (whichever is less); ~~and~~
5. All subdivision proposals and other proposed developments shall assess the cumulative and project specific impacts of land use changes and development through a detailed hydrologic and hydraulic analyses and/or demonstration of the cumulative effect of the proposed land use changes or development.

## B. Anchoring:

1. All new construction and substantial improvements shall be anchored to prevent flotation, collapse or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy.
2. All manufactured homes must likewise be anchored to prevent flotation, collapse or lateral movement and shall be installed using methods and practices that minimize flood damage. Anchoring methods may include, but are not limited to, use of over the top or frame ties to ground anchors (see FEMA's "Manufactured Home Installation In Flood Hazard Areas" guidebook for additional techniques).

## C. Construction Materials And Methods:

1. Materials: All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.
2. Construction Methods And Practices: All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.
3. Location Of Service Facilities: Electrical, heating, ventilation, plumbing and air conditioning equipment and other service facilities shall be designed and/or otherwise elevated or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

4. Drainage Paths: Within zones AH or AO, all new construction and substantial improvements shall be constructed so that there are adequate drainage paths around structures on slopes to guide floodwaters around and away from proposed structures.

5. Elevation And Floodproofing:

- a. New construction and substantial improvement of any structure shall have the lowest floor, including basement, elevated to or above the base flood elevation as follows:

In zone AO: Elevated above the highest adjacent grade to a height equal to or exceeding the depth number specified in feet on the FIRM by at least one foot (1'), or elevated at least two feet (2') above the highest adjacent grade if no depth number is specified.

In zone A: Elevated above the highest adjacent grade to a height equal to or exceeding the depth number specified in feet on the FIRM by at least one foot (1').

In all other zones where the base flood elevation has been determined: The lowest floor elevated at least one foot (1') above the base flood elevation.

- b. Manufactured homes shall meet the above standards.

Nonresidential structures may meet the standards in subsection C5c of this section. Upon completion of the structure, the elevation of the lowest floor, including basement, shall be certified by a registered professional engineer or surveyor to verify to the floodplain administrator that elevation requirements have been met. Notification of compliance shall be recorded as set forth in subsection 12.01.07C2b of this chapter.

- c. Nonresidential construction shall either be elevated to conformance with subsection C5a of this section or, together with attendant utility and sanitary facilities:

- (1) Be floodproofed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water;

- (2) Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and

- (3) Be certified by a registered professional engineer or architect that the standards of this subsection are satisfied. Such certifications shall be provided to the floodplain administrator.

6. Requirements For All Crawl Space Construction:

- a. The building must be designed and adequately anchored to resist flotation, collapse, and lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy. Hydrostatic loads and the effects of buoyancy can usually be addressed through the required openings discussed in the next subsection. Because of hydrodynamic loads, crawl space construction is not recommended in areas with flood velocities greater than five feet (5') per second unless the design is reviewed by a qualified design professional, such as a registered architect or professional engineer.

- b. The crawl space is an enclosed area below the BFE and, as such, must have openings that equalize hydrostatic pressures by allowing for the automatic entry and exit of floodwaters. The bottom of each flood vent opening can be no more than one foot (1') above the lowest adjacent exterior grade.

- c. Portions of the building below the BFE must be constructed with materials resistant to flood damage. This includes not only the foundation walls of the crawl space used to elevate the building, but also any joists, insulation, or other materials that extend below the BFE. The required construction practice is to elevate the bottom of joists and all insulation two feet (2') above BFE. Insulation is not a flood resistant material. When insulation becomes saturated with floodwater, the additional weight often pulls it away from the joists and flooring. Ductwork or other utility systems located below the insulation may also pull away from their supports.
- d. Any building utility systems within the crawl space must be elevated above BFE or designed so that floodwaters cannot enter or accumulate within the system components during flood conditions. Ductwork, in particular, must either be placed above the BFE or sealed from floodwaters.
- e. Additional requirements for below grade crawl spaces:
  - (1) The interior grade of a crawl space below the BFE must not be more than two feet (2') below the lowest adjacent exterior grade (LAG), shown as D in figure 3 of this section.
  - (2) The height of the below grade crawl space, measured from the interior grade of the crawl space to the top of the crawl space foundation wall must not exceed four feet (4') (shown as L in figure 3 of this section) at any point. The height limitation is the maximum allowable unsupported wall height according to the engineering analyses and building code requirements for flood hazard areas. This limitation will also prevent these crawl spaces from being converted into habitable spaces.
  - (3) There must be an adequate drainage system that removes floodwaters from the interior area of the crawl space. The enclosed area should be drained within a reasonable time after a flood event. The type of drainage system will vary because of the site gradient and other drainage characteristics, such as soil types. Possible options include natural drainage through porous, well drained soils and drainage systems such as perforated pipes, drainage tiles, or gravel or crushed stone drainage by gravity or mechanical means.
  - (4) The velocity of floodwaters at the site should not exceed five feet (5') per second for any crawl space. For velocities in excess of five feet (5') per second, other foundation types should be used.

*Figure 1 Preferred crawl space construction.*

*Figure 2 Below grade crawl space construction.*

*Figure 3 Requirements regarding below grade crawl space construction.*

D. Utilities:

- 1. All new and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters or discharge from the systems into floodwaters. Sanitary sewer and storm drainage systems for buildings that have openings below the base flood elevation shall be provided with automatic backflow valves or other automatic backflow devices that are installed in each discharge line passing through a building's exterior wall.
- 2. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems and discharge from the systems into floodwaters; and
- 3. On site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

E. Review Of Building Permits: Applications for building permits shall be reviewed to assure that proposed construction will be reasonably safe from flooding. The test of reasonableness is a local judgment and includes use of historical data, high water marks, photographs of past flooding, etc., where available.

12.01.13: SPECIFIC STANDARDS FOR FLOOD HAZARD REDUCTION:

In all areas of special flood hazards where base flood elevation data has been provided as set forth in subsection 12.01.07A or B of this chapter, the following provisions are required:

A. Residential Construction:

1. New construction and substantial improvement of any residential structure shall have the lowest floor, including basement, elevated one foot (1') above base flood elevation.
2. Fully enclosed areas below the lowest floor other than a crawl space constructed in conformance with subsection 12.01.12C6 of this chapter subject to flooding are prohibited or shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria:
  - a. A minimum of two (2) openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided.
  - b. The bottom of all openings shall be no higher than one foot (1') above grade.
  - c. Openings may be equipped with screens, louvers or other coverings or devices; provided, that they may permit the automatic entry and exit of floodwaters.

B. Manufactured Homes: All manufactured homes to be placed or substantially improved within zones A, AH and AE shall be elevated on a permanent foundation such that the lowest floor bottom of the structural frame or the lowest point of any attached appliances, whichever is lower, of the manufactured home is at least one foot (1') above the base flood elevation or at least two feet (2') when no base flood elevation data is available and shall be securely anchored to an adequately anchored foundation system in accordance with the provisions of subsection 12.01.12B2 of this chapter.

C. Nonresidential Construction: New construction and substantial improvement of any commercial, industrial or other nonresidential structure shall either have the lowest floor, including basement, elevated to the level of the base flood elevation or, together with attendant utility and sanitary facilities, shall:

1. Be floodproofed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water;
2. Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy;
3. Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this subsection based on their development and/or review of the structural design, specifications and plans. Such certifications shall be provided to the official as set forth in subsection 12.01.07C2 of this chapter.
4. Nonresidential structures that are elevated, not floodproofed, must meet the same standards for space below the lowest floor as described in subsection A2 of this section.

5. Applicants floodproofing nonresidential buildings shall be notified that flood insurance premiums will be based on rates that are one foot (1') below the floodproofed level (e.g., a building constructed to the base flood level will be rated as 1 foot below that level).
- D. Floodways: Located within areas of special flood hazard established in subsection 12.01.07A of this chapter are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters which carry debris, potential projectiles and erosion potential, the following provisions apply:
1. Encroachments, including fill, new construction, substantial improvements and other development are prohibited unless it has been demonstrated through hydrologic and hydraulic analyses, performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge, and the federal emergency management agency has issued a conditional letter of map revision (CLOMR).
  2. If subsection D1 of this section is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions of this section and section 12.01.12 of this chapter.
- E. Recreational Vehicles: All recreational vehicles placed on sites within zones A, A1-30, AH, and AE on the FIRM will be fully licensed and ready for highway use (a recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to a site only by quick disconnect type utilities and security devices, and has no permanently attached additions).

#### 12.01.14: VARIANCES AND APPEALS:

- A. Authority: The board of county commissioners shall hear and decide appeals and requests for variances from the requirements of this chapter.
- B. Appeals:
1. The board of county commissioners shall hear and decide appeals when it is alleged there is an error in any requirement, decision or determination made by the floodplain administrator of this chapter.
  2. Those aggrieved by the decision of the board of county commissioners may appeal such decision to the appropriate court as provided in Nevada Revised Statutes.
- C. Variances:
1. Application For Variance: In passing upon such applications, the board of county commissioners shall consider all technical evaluations, all relevant factors, standards specified in other sections of this chapter, and:
    - a. The danger that materials may be swept onto other lands to the injury of others;
    - b. The danger to life and property due to flooding or erosion damage;
    - c. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
    - d. The importance of the services provided by the proposed facility to the community;
    - e. The necessity to the facility of a waterfront location, where applicable;



- f. The availability of alternative locations for the proposed use which are not subject to flooding or erosion damage;
  - g. The compatibility of the proposed use with existing and anticipated development;
  - h. The relationship of the proposed use to the comprehensive plan and floodplain management program for that area;
  - i. The safety of access to the property in times of flood for ordinary and emergency vehicles;
  - j. The expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site; and
  - k. The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical and water system and streets and bridges.
2. Conditions May Be Imposed: Upon consideration of the factors of subsection C1 of this section and the purposes of this chapter, the county board of commissioners may attach such conditions to the granting of variances as it deems necessary to further the purposes of this chapter.
3. Standards For Granting Variances:
- a. Generally, the only condition under which a variance from the elevation standard may be issued is for new construction and substantial improvements to be erected on a lot of one-half (1/2) acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing items in subsections C1a through C1k of this section have been fully considered. As the lot size increases, the technical justification required for issuing the variance increases.
  - b. Variances may be issued for the rehabilitation or restoration of historic structures.
  - c. Variances shall not be issued within any designated floodway if any increase in flood levels during the base flood discharge would result.
  - d. Variances shall only be issued upon determination that the variance is the minimum necessary, considering the flood hazard to afford relief.
  - e. Variances shall only be issued upon:
    - (1) A showing of good and sufficient cause such as renovation, rehabilitation or reconstruction. Variances issued for economic considerations, aesthetics or because variances have been used in the past are not good and sufficient cause;
    - (2) A determination that failure to grant the variance would result in exceptional hardship to the applicant; and
    - (3) A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public or conflict with existing local laws or ordinances.
  - f. Variances, as interpreted in the national flood insurance program, are based on the general zoning law principle that they pertain to a physical piece of property, they are not personal in nature and do not pertain to the structure, its inhabitants, economic or financial circumstances. They primarily address

small lots in densely populated residential neighborhoods. As such, variances from the flood elevations should be quite rare.

- g. Variances may be issued for nonresidential buildings in very limited circumstances to allow a lesser degree of floodproofing than watertight or dry floodproofing, where it can be determined that such action will have low damage potential, complies with all other variance criteria except subsection C3a of this section and otherwise complies with subsections 12.01.12A and B of this chapter.

- 4. Notice When Variance Granted: Any applicant to whom a variance is granted shall be given written notice that the structure will be permitted to be built with a lowest floor elevation below the base flood elevation and that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced lowest floor elevation.

D. Records And Reports: The county clerk shall maintain the records of all appeal actions and report any variances to the federal emergency management agency upon request.

#### 12.01.15: LETTERS OF MAP REVISION/AMENDMENT:

National flood insurance program regulations provide procedures to remove property from the 100-year floodplain or from a special flood hazard area. Amendments and revisions to community flood insurance rate maps cannot adversely impact the floodplain or floodway delineations of the level of the 100-year flood.

There are several procedures provided whereby the federal insurance administrator will review information from the community, an owner, or a lessee of property where it is believed the property should not be included in a special flood hazard area.

Submissions to FEMA for revisions to effective flood insurance studies (FISs) by individual and community requesters will require the signing of application/certification forms. These forms will provide FEMA with assurance that all pertinent data relating to the revision is included in the submittal. They will also assure that: a) the data and methodology are based on current conditions; b) qualified professionals have assembled data and performed all necessary computations; and c) all individuals and organizations impacted by proposed changes are aware of the changes and will have an opportunity to comment on them.

FEMA procedures permit the following types of request:

A request for a revision to the effective FIS information (FIRM, FBFM, and/or FIS report) is usually a request that FEMA replace the effective floodplain boundaries, flood profiles, floodway boundaries, etc., with those determined by the requester. Before FEMA will replace the effective FIS information with the revised, the requester must: a) provide all of the data used in determining the revised floodplain boundaries, flood profiles, floodway boundaries, etc.; b) provide all data necessary to demonstrate that the physical modifications to the floodplain have been adequately designed to withstand the impacts of the one percent (1%) annual chance flood event and will be adequately maintained; c) demonstrate that the revised information (e.g., hydrologic and hydraulic analyses and the resulting floodplain and floodway boundaries) is consistent with the effective FIS information.

Requests for amendments or revisions to FEMA maps must be reviewed and submitted to FEMA by the (governing body) of (county or municipality) with the applicant for a map amendment or revision required to prepare all the supporting information and appropriate FEMA forms.

The scientific or technical information to be submitted with these requests may include, but is not limited to, the following:

- A. An actual copy of the recorded plat map bearing the seal of the appropriate recordation official county clerk or recorder of deeds indicating the official recordation and proper citation, deed or plat book volume and page number, or an equivalent identification where annotation of the deed or plat book is not the practice.
- B. A topographical map showing:
  - 1. Ground elevation contours in relation to the NAVD 88 (national geodetic vertical datum).
  - 2. The total area of the property in question.
  - 3. The location of the structure or structures located on the property in question.
  - 4. The elevation of the lowest adjacent grade to a structure or structures.
  - 5. An indication of the curvilinear line which represents the area subject to inundation by a base flood. The curvilinear line should be based upon information provided by an appropriate authoritative source, such as a federal agency, department of water resources, a county water control district, a county or city engineer, a federal emergency management agency flood insurance study, or a determination by a registered professional engineer.
- C. A copy of the FHBM or FIRM indicating the location of the property in question.
- D. A certification by a registered professional engineer or licensed land surveyor that the lowest grade adjacent to the structure is above the base flood elevation.
- E. The completion of the appropriate forms in the federal emergency management agency's packets, amendments and revisions to national flood insurance program maps (MT-1 FEMA form 81-87 series and MT-2 FEMA form 81-89 series).
- F. The applicant shall provide the proposed map revision to the floodplain administrator in form and format compatible with the county geographical information system (GIS). The scale of the plan, improvements, monuments and other items shall be in model space correctly oriented to coordinate system as established by the GIS coordinator.

#### 12.01.16: WARNING AND DISCLAIMER OF LIABILITY:

The degree of flood protection required by this chapter is considered reasonable for regulatory purpose and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by manmade or natural causes. This chapter does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flood damages. This chapter shall not create liability on the part of Lyon County or any officer or employee thereof or the federal insurance administration for any flood damages that result from reliance on this chapter or any administrative decision lawfully made hereunder.

**Section 2.** If any section of this ordinance or portion thereof is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such holding shall not invalidate the remaining parts of this ordinance.

**Section 3.** All ordinances, parts of ordinances, chapters, sections, subsections, clauses, phrases or sentences contained in the Lyon County Code in conflict herewith are hereby repealed.

**Section 4.** This ordinance shall be in full force and effect from and after its passage, approval, and publication as required by law.

THIS RESOLUTION was proposed on the \_\_\_\_ day of \_\_\_\_\_, 201\_ by the following County Commissioners(s): \_\_\_\_\_.

THIS RESOLUTION has been PASSED, ADOPTED and APPROVED this \_\_\_\_ day of \_\_\_\_\_, 201\_ by the following vote of the Board of Commissioners, Lyon County:

AYES:

\_\_\_\_\_

NAYS:

\_\_\_\_\_

ABSENT:

\_\_\_\_\_

ABSTENTIONS:

\_\_\_\_\_

Board of County Commissioners  
Lyon County

\_\_\_\_\_  
By: Chairman

Attest:

\_\_\_\_\_  
Clerk of the Board

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