

## Section 21–Regional Mitigation Actions

Overview .....	1
Previous Actions and Analysis.....	2
Texas Colorado River Floodplain Coalition .....	2
Lower Colorado River Authority.....	17
New Actions .....	25
TCRFC.....	25
LCRA .....	79

### Overview

This section includes the listing of the mitigation actions proposed by TCRFC and LCRA. Sections 22 through 25 of this Plan Update contain the mitigation actions of each participating jurisdiction, separated by region.

The actions described in this regional section as well as the four sections hereafter are designed to achieve the mitigation goals and objectives established in Section 20: *Mitigation Strategy*, and will be maintained on a regular basis according to the plan maintenance procedures established in Section 2.

As described in the previous section, the Mitigation Action Plan, or MAP, represents an unambiguous and functional plan for action. Each proposed mitigation action has been identified as an effective measure (policy or project) to reduce hazard risk for the TCRFC.

Each action is listed in the MAP in conjunction with background information such as the specific site and location of the project and the history of damages, if applicable. Other information provided in the MAP includes data on cost estimates and potential funding sources to implement the action should funding be required (not all proposed actions are contingent upon funding).

Most importantly, implementation mechanisms are provided for each action, including the designation of a lead agency or department responsible for carrying the action out as well as a timeframe for its completion. These implementation mechanisms ensure that the Plan remains a functional document that can be monitored for progress over time.

The proposed actions are not listed in exact priority order, though each has been assigned a priority level of “high,” “moderate” or “low” as. Further, as this is an update to the 2004 Plan, an analysis is provided for actions previously included.

There are at least two mitigation actions for each of the thirteen hazards in the Plan Update. In developing individual mitigation actions, each jurisdiction identified, evaluated and analyzed the actions contained herein.

## Previous Actions and Analysis

### *Texas Colorado River Floodplain Coalition*

<b>TCRFC (Past Action)-1</b>	
<b>Proposed Action:</b>	<p>Improve local floodplain management through adoption of higher regulatory standards. Promote the principles of “no adverse impact.”</p> <p>Encourage adoption of a “no-rise” in BFE in the 100-year floodplain.</p> <p>Encourage freeboard requirements for permitting structures in the SFHA.</p> <p>Encourage the inclusion of cumulative damage provisions in local ordinances.</p> <p>Disseminate model ordinances and conduct program assessments.</p> <p>Encourage communities to participate in the Community Rating System, with an objective to have 5 CRS communities by October 2004 and an additional 5 communities by April 2005.</p>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin Wide

<p><b>History of Damages:</b></p>	<p>The mission of the Texas Colorado River Floodplain Coalition is to encourage comprehensive, consistent management of the floodplain along the Colorado River. Central to that mission is regional coordination and planning to reduce flood damage. Rapid development both in and out of the mapped floodplains is occurring in many parts of the Colorado River Basin. Most communities do not coordinate floodplain management activities with other communities in the watershed and do not receive information regarding upstream or downstream development activities that may be impacting the floodplain.</p> <p>With this action, the Coalition will work to enhance regional floodplain management and coordinate floodplain management programs by establishing common regional goals, objectives, permit criteria and procedures for development within the Colorado River Basin. These activities will further the goal of “No Adverse Impact.” No adverse impact floodplain management means the action of one property owner does not adversely impact the rights of other property owners, as measured by increased flood peaks, flood stage, flood velocity, and erosion and sedimentation.</p> <p>This mitigation action involves development of a Guidance Manual containing recommended criteria, policies and procedures; provision of training; provision of technical assistance; conducting assessments of local floodplain management programs; and issuance of model ordinances and permitting criteria.</p>
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MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	Flood
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	The budget for support of TCRFC administration and programs in FY 2004 is \$304,000. Future costs are to be determined.
<b>Potential Funding Sources:</b>	Local Revenue and Grants
<b>Lead Agency/Department Responsible:</b>	The Texas Colorado River Floodplain Coalition, with technical support provided by the Lower Colorado River Authority.

<b>Implementation Schedule:</b>	This action will begin in September 2003 and continue, ongoing, through September 2012. Floodplain assessments will be conducted annually. The objectives are to have 5 CRS communities by October 2011 and an additional 5 communities by April 2011.
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<b>2009 Analysis:</b>
<p>Higher regulatory standards have been set and completed such as freeboard and higher level ordinances. The TCRFC has completed the promotion the principles of “no adverse impact.” The encouraged adoption of a “no-rise” in BFE in the 100-year 1% ACE is complete. Encouraged freeboard requirements for permitting structures in the SFHA and the inclusion of cumulative damage provisions in local ordinances is complete. Disseminate model ordinances and conduct program assessments. The TCRFC has not completed the encouragement of communities to participate in the Community Rating System, with an objective to have 5 CRS communities by October 2004 and an additional 5 communities by April 2005. Therefore this part of the action will be deferred for the 2009 Update.</p> <p>The TCRFC will be the responsible agency as it is now self-funded.</p>

<b>TCRFC (Past Action)-2</b>	
<b>Proposed Action:</b>	<b>Provide training for elected officials and professional technical staff (including emergency management coordinators) on floodplain management and emergency management issues.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin Wide
<b>History of Damages:</b>	<p>Many elected officials and city and county staff that must deal with floodplain management or emergency management issues do not receive adequate training or have access to comprehensive technical resources.</p> <p>With this action, the Texas Colorado River Floodplain Coalition will provide enhanced training programs for floodplain administrators, emergency management coordinators, and elected officials. The training program will be developed in partnership with Federal and state agencies and professional organizations. It will involve short courses, training seminars, workshops, conferences, on-call speakers, videos, websites and other educational resources directed at educating elected officials, the regulatory community, and the public about floodplain management and emergency management issues.</p> <p>The Coalition will work to support the “Certified Floodplain Manager” program administered by the Texas Floodplain Management Association and the Association of State Floodplain Managers, Inc.; the “certified Emergency Manager” program administered by the International Association of Emergency Managers; and the Texas Emergency Manager certification program administered by the Emergency Management Association of Texas.</p>

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood

<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	The budget for support of TCRFC administration and programs in FY 2004 is \$304,000. Future costs are to be determined.
<b>Potential Funding Sources:</b>	General Revenue and Grants
<b>Lead Agency/Department Responsible:</b>	The Texas Colorado River Floodplain Coalition, with technical support provided by the Lower Colorado River Authority.
<b>Implementation Schedule:</b>	This action will begin in September 2003 and continue, ongoing, through September 2012.

<b>2009 Analysis:</b>	
This action was completed, but as it is an ongoing activity, it will be deferred for the 2009 Update. Training is a vital function of the TCRFC as many communities experience high turnover and rules continue to change.	

<b>TCRFC (Past Action)-3</b>	
<b>Proposed Action:</b>	<p><b>Facilitate inter-jurisdictional and basin-wide federal flood-mapping studies to improve understanding of flood risk.</b></p> <p><b>Develop and maintain a Map Master Plan.</b>  <b>Set priorities for flood mapping needs in the Lower Colorado River Basin.</b></p> <p><b>Complete the production of Digital Flood Insurance Rate Maps for additional basin communities</b></p>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin Wide
<b>History of Damages:</b>	<p>The Flood Insurance Rate Maps of most communities in the Texas Colorado River Floodplain Coalition are older than fifteen years; they no longer accurately represent flooding and development patterns. Some communities have no Flood Insurance Rate Maps at all.</p> <p>Development in the Lower Colorado River Basin is occurring rapidly. From 1990 to 2000, the population increased by more than 40 percent in five basin counties. The overwhelming majority of Coalition members identified new and revised floodplain maps as their highest priority for improving floodplain management.</p> <p>This action involves developing and maintaining a Map Master Plan, setting basin-wide mapping priorities, and producing digital Flood Insurance Rate Maps for more basin communities. The Map Master Plan will document each community’s mapping needs and assign them a relative priority in the context of the region as a whole. It will provide a schedule for producing and implementing the plan and will address how to keep maps up to date.</p>

**MITIGATION ACTION DETAILS**

<b>Hazard(s) Addressed:</b>	Flood
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	The Texas Colorado River FI Costs for map production vary from \$4.7 million to \$16.8 million depending upon complexity and detail of map.
<b>Potential Funding Sources:</b>	Mapping the Colorado River Basin will proceed as funding becomes available from FEMA's Map Modernization Program, the Lower Colorado River Authority, and local funding sources.
<b>Lead Agency/Department Responsible:</b>	Colorado River Floodplain Coalition, with technical support provided by the Lower Colorado River Authority.
<b>Implementation Schedule:</b>	This action started in March 2001 with funding under FEMA's Best Practices Mapping Program. Mapping will proceed as additional funding becomes available through 2013
<b>2009 Analysis:</b>	
This action is complete in part, but will also be deferred in part. A master plan was developed with FEMA, and a number of priorities for the TCRFC were accomplished. The D-FIRMS were complete, but there are still communities within the TCRFC that do not have maps yet. Therefore this action should be deferred to the extent that it is needed to help communities that do not have maps.	

<b>TCRFC (Past Action)-4</b>	
<b>Proposed Action:</b>	<p><b>(1) Facilitate inter-jurisdictional review of basin-wide Federal flood studies to identify projects to achieve flood damage reduction.</b></p> <p><b>(2) Assist in obtaining public input on the U.S. Corps of Engineers Lower Colorado River Basin Study and analyze the potential impact of each flood-reduction alternative on local jurisdictions.</b></p>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin Wide
<b>History of Damages:</b>	<p>The U.S. Army Corps of Engineers is conducting a Lower Colorado River Basin Study in three phases. Phase 1, completed July 2002, and identified: existing conditions regarding flood damages to residential, commercial, industrial and public structures; environmental conditions and opportunities for enhancement of natural ecosystems; and recreational needs within the basin. The Phase 1 study area is the main stem of the Colorado River. Phase 2 will involve conduct of interim feasibility studies focusing on known flood problem areas. Under Phase 3, the Corps will develop and evaluate alternatives for implementing solutions to water resource-related problems. A number of alternatives for reducing the risk or magnitude of flood damages will be evaluated. The Corps of Engineers will then examine the consequence of each alternative, including the economic and environmental costs and benefits, and work with the LCRA and communities in the basin, through the Coalition, to decide on the most effective and practical course of action.</p> <p>The Texas Colorado River Floodplain Coalition will work with individual jurisdictions in conducting public outreach on the study results and analyze the impact of each flood reduction alternative on local jurisdictions.</p>

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Priority (High, Moderate, Low):</b>	Medium
<b>Estimated Cost:</b>	\$1.6 million is required in 2004 for the Corps to continue the multi-year study. Additional funding will be required in 2005 and subsequent years
<b>Potential Funding Sources:</b>	U.S. Army Corps of Engineers
<b>Lead Agency/Department Responsible:</b>	Colorado River Floodplain Coalition, with technical support provided by the Lower Colorado River Authority.
<b>Implementation Schedule:</b>	Specific flood reduction alternatives will be completed by 2005.
<b>2009 Analysis:</b>	
This action is complete in part, but also deferred. Phase 1 has been completed and the Coalition is now looking at the operational procedures for Phase 2. This includes reviewing the operational procedures for Mansfield Dam as well as the impacts on flooding in the lower basin.	

**TCRFC (Past Action)-5**

<b>Proposed Action:</b>	<b>Conduct community education and outreach on flood insurance and floodplain management issues. Educate the community on the dangers of low-water crossings. Promote flood insurance by launching a “Cover the Basin” campaign</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin Wide
<b>History of Damages:</b>	The most effective floodplain-management programs are based on public education and understanding of the causes of flooding and ways to mitigate damage to life and property. A comprehensive, concerted community education and outreach campaign is needed to give the citizens of the basin the knowledge and tools necessary to mitigate damage before disaster strikes, better prepare for disaster, and know what to do in an emergency situation. Outreach will include a “Cover the Basin” campaign to educate citizens in high-risk areas regarding the need for and benefits of flood insurance

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Priority (High, Moderate, Low):</b>	Medium
<b>Estimated Cost:</b>	The budget for support of TCRFC administration and programs in FY 2004 is \$304,000. Future costs are to be determined.
<b>Potential Funding Sources:</b>	Coalition dues, LCRA funding, and FEMA grants
<b>Lead Agency/Department Responsible:</b>	Colorado River Floodplain Coalition, with technical support provided by the Lower Colorado River Authority.
<b>Implementation Schedule:</b>	This on-going activity will start in 2004 and end in 2013.
<b>2009 Analysis:</b>	
This action is deferred as education is an ongoing activity. The Coalition will defer the action regarding educating the community on the dangers of low-water crossings. Even though the “Cover the Basin” campaign has been completed (the TCRFC completed press releases on the importance of buying flood insurance before the map changes as well as workshops with the NFIP), this action is also ongoing. The TCRFC continues to send out messages through FloodSmart. For 2009 Plan Update, the goal will be to have an annual NFIP insurance training workshop throughout the basin.	

<b>TCRFC (Past Action)-6</b>	
<b>Proposed Action:</b>	<p><b>Assist TCRFC communities in achieving designation by the National Weather Service as “Storm Ready” communities.</b></p> <p><b>Establish 24-hour warning reception points.</b></p> <p><b>Improve monitoring of hydrometeorological data.</b></p> <p><b>Enhance the ability to inform communities and special authorities about weather warnings.</b></p> <p><b>Increase public education about severe weather threats and appropriate responses.</b></p>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin Wide
<b>History of Damages:</b>	<p>By designating them as “Storm Ready,” the National Weather Service recognizes local communities that have demonstrated a strong commitment to putting the infrastructure and systems in place that will save lives and protect property in the event of a severe weather event. To date, the City of Lakeway and the City of Brownwood are designated as “Storm Ready.”</p> <p>Six criteria are used to determine if a city or county is “Storm Ready:” 24-hour Warning Reception Point and Emergency Operations Center; ability for these centers to receive National Weather Service warnings; ability to monitor hydrometeorological data; ability to inform the community and special authorities about weather warnings; public education about severe weather threats and appropriate responses; and formal hazards and risk assessment planning.</p>

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood, Hail, Hurricane & Tropical Storm, Tornado, Thunderstorm
<b>Priority (High, Moderate, Low):</b>	Medium
<b>Estimated Cost:</b>	The budget for support of TCRFC administration and programs in FY 2004 is \$304,000. Future costs are to be determined.
<b>Potential Funding Sources:</b>	General revenue and Grants
<b>Lead Agency/Department Responsible:</b>	Colorado River Floodplain Coalition, with technical support provided by the Lower Colorado River Authority.
<b>Implementation Schedule:</b>	Beginning 2003 through 2012
<b>2009 Analysis:</b>	
This action is deferred as some, but not all communities have achieved the designation of “Storm Ready”. Thus far only the LCRA, Lago Vista, Brady and the City of Brownwood are StormReady communities.	

<b>TCRFC (Past Action)-7</b>	
<b>Proposed Action:</b>	<b>Add new communities to the July 14, 2007 Hazard Mitigation Plan for the Lower Colorado River Basin and update the Plan based upon changes in risk, new risk information, and changes in land development.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin Wide
<b>History of Damages:</b>	<p>The Hazard Mitigation Plan for the Lower Colorado River Basin, “<i>Creating A Disaster Resistant Lower Colorado River Basin</i>,” was approved by the Federal Emergency Management Agency on July 14, 2004. At the time, 34 cities and 13 counties which are members of the Coalition participated in the Plan. Since that time, additional members have joined the Coalition, and additional jurisdictions have expressed an interest in joining the Coalition Plan.</p> <p>This action would add over 40 new communities. It would also update the entire plan based on changes in risk, new risk information, and changes in land development. It will involve setting up the planning process, conducting a jurisdiction-based risk assessment, and assisting the communities in developing mitigation actions. It is intended to result in FEMA-approved plans for over 40 additional jurisdictions and reduce the long-term risk to people and property throughout the region from a range of hazards.</p>

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood, Hail, Hurricane & Tropical Storm, Tornado, Thunderstorm, Winter Storm, Hazardous Materials Release, Dam Failure, Pipeline Failure, Terrorism
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$275,000
<b>Potential Funding Sources:</b>	Beginning 2003 through 2012. The 25% match will be met with in-kind services from the Texas Colorado River Floodplain Coalition member jurisdictions and Lower Colorado River

Section 21 – Regional Mitigation Actions

	Authority.
<b>Lead Agency/Department Responsible:</b>	Colorado River Floodplain Coalition, with technical support provided by the Lower Colorado River Authority.
<b>Implementation Schedule:</b>	Eighteen months from Grant approval.
<b>2009 Analysis:</b>	
This action was completed. In 2007 the TCRFC received an HMGP grant for the completion of a Hazard Mitigation Plan Update to include additional communities in the planning area. Thirteen new communities joined the mitigation effort and are included in this Plan.	

<b>TCRFC (Past Action)-8</b>	
<b>Proposed Action:</b>	<b>Acquire 200 “Turn Around, Don’t Drown” warning signs for low water crossings to be placed strategically at low water crossings throughout the Lower Colorado River Basin in the heart of Flash Flood Alley.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Lower Colorado River Basin
<b>History of Damages:</b>	Between January and September 2007, there have been 40 flash flood fatalities in the State of Texas, 30 of which were vehicle related. Among its goals of the Texas Colorado River Floodplain Coalition is public education and awareness, including educating the community on the dangers of low water crossings. “Turn Around, Don’t Drown” signs placed in strategic locations will warn drivers of the low water crossings and educate them about the danger of entering them when flooded. These signs would help educate the public about the dangers of flooded roadways and would elicit more appropriate actions/responses by drivers when approaching a flooded roadway.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$60,000
<b>Potential Funding Sources:</b>	State and local Grant funds
<b>Lead Agency/Department Responsible:</b>	Colorado River Floodplain Coalition, with technical support provided by the Lower Colorado River Authority.
<b>Implementation Schedule:</b>	1 month after grant award – purchase the 200 signs 2 months after grant award – publicize sign program to TCRFC members and solicit interest for placement 4 months after grant award – coordinate distribution 8 months after grant award – follow up to determine that signs have been placed and map where they are located 12 months after grant award – project completion, all signs in place and mapped for reference
<b>2009 Analysis:</b>	
While the TCRFC promotes “Turn Around, Don’t Drown”, this task will be deleted as it is more suited for individual jurisdictions to undertake	

***Lower Colorado River Authority***

<b>LCRA (Past Action)-1</b>	
<b>Proposed Action:</b>	<b>Undertake a dam safety program to improve inspection and maintenance of all dams to ensure that they can withstand the maximum probable flood event; review and update dam-failure emergency action plans annually. Improve dam-failure modeling capability.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Lower Colorado River Basin

<p><b>History of Damages:</b></p>	<p>The LCRA continues to make improvements to all of the dams in the Highland Lakes region. Mansfield Dam is able to withstand the probable maximum flood (PMF) without further reinforcement. This fact means that even in the event of failures of Buchanan, Inks, Wirtz, or Starcke dams, Mansfield Dam would hold their floodwaters and Lake Travis would not overtop Mansfield Dam. The Dam Modernization Program began in 1995 and is expected to continue through FY 2004 to strengthen the six Highland Lakes dams and ensure their safety for years to come. The dams have performed virtually trouble free for decades. However, natural wear over the years and more stringent design and construction standards have created a need to update and improve the dams. Stricter state and federal dam safety regulations were adopted in the 1970s and 1980s as a direct response to numerous dam failures across the country. These standards require that dams be able to withstand the most severe flood imaginable, the Probable Maximum Flood (PMF). This flood is so severe and statistically remote that its probability of occurrence in any given year cannot be measured.</p> <p>The Dam Modernization program will ensure that LCRA’s dams meet required design safety standards to resist the water load and pressure of the PMF. In addition to capital improvements, this action improving LCRA’s dam failure modeling capabilities, review and update of dam failure emergency action plans, and continuing inspection and maintenance of all dams to ensure that they can withstand the PMF.</p>
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<p><b>MITIGATION ACTION DETAILS</b></p>	
<p><b>Hazard(s) Addressed:</b></p>	<p>Dam Failure, Flood</p>
<p><b>Priority (High, Moderate, Low):</b></p>	<p>High</p>
<p><b>Estimated Cost:</b></p>	<p>\$50 Million</p>
<p><b>Potential Funding Sources:</b></p>	<p>State and local Grant funds</p>
<p><b>Lead Agency/Department Responsible:</b></p>	<p>Lower Colorado River Authority.</p>
<p><b>Implementation Schedule:</b></p>	<p>Complete</p>
<p><b>2009 Analysis:</b></p>	
<p>This action has been completed.</p>	

<b>LCRA (Past Action)-2</b>	
<b>Proposed Action:</b>	<p><b>Maintain and expand hydrometeorological monitoring system.</b></p> <p><b>Identify sites where stream gauges need to be added or upgraded and coordinate installation requests with U.S.G.S.</b></p> <p><b>Expand the volunteer rainfall observer program.</b></p>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Lower Colorado River Basin
<b>History of Damages:</b>	<p>Information on the flow of the Colorado River and rainfall amounts throughout the basin are vital to safeguarding lives and property and ensuring adequate water resources. LCRA, with the assistance of the United States Geological Survey, operates a network of stream gauges that provide real-time and long-term historical flow of information. Such information is used for flood forecasting and mapping flood-prone areas; planning and managing water supplies; developing water quality standards and monitoring changes in flow; and designing structures.</p> <p>LCRA has a Rainfall Observer Program. This action seeks to expand the program by adding additional observers to obtain a more comprehensive picture of rainfall amounts.</p>

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$4.4 Million
<b>Potential Funding Sources:</b>	State and local Grant funds
<b>Lead Agency/Department Responsible:</b>	Lower Colorado River Authority.
<b>Implementation Schedule:</b>	Complete
<b>2009 Analysis:</b>	
<p>This action has been completed. The Rainfall Observer Program has been rolled into the National Weather Service's CoCoRaHS program so more people have access to the volunteer rainfall data being observed.</p>	

<b>LCRA (Past Action)-3</b>	
<b>Proposed Action:</b>	<b>Continue to support the Texas Colorado River Floodplain Coalition in administrative support of programs.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Lower Colorado River Basin
<b>History of Damages:</b>	The Lower Colorado River Authority serves as the Administrative Agency for the Texas Colorado River Floodplain Coalition. The administrative services and functions it provides are specified in an Interlocal Agreement. Its activities include providing logistical support for meetings; acting as a central clearinghouse for technical information, models, studies, training and educational opportunities; identifying funding options and preparing and submitting grant applications on behalf of the Coalition; maintaining a web page and internet address for the Coalition; maintaining a computer database of floodplain application and permitting information; arranging for an independent assessment of each member's floodplain management program; and contracting with a qualified engineering consultant to perform, at the request of a coalition member, technical reviews of development permit applications.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	The budget for support of TCRFC administration and programs in FY 2004 is \$304,000. Future costs are to be determined.
<b>Potential Funding Sources:</b>	State and local Grant funds
<b>Lead Agency/Department Responsible:</b>	Lower Colorado River Authority.
<b>Implementation Schedule:</b>	Complete

**2009 Analysis:**

This action has been completed. The LCRA is a technical partner and as such only provides technical support to the TCRFC. The Coalition has their own administration and maintains a database of floodplain application and permitting information. Assessment of each member’s floodplain management program was completed for the entire basin. The LCRA will no longer directly incur any costs related to the Coalition as they are self-funded and independent. The funding guide has been developed and is updated by a consultant firm.

**LCRA (Past Action)-4**

<b>Proposed Action:</b>	<b>Support local jurisdictions in the LCRA service area in obtaining funds for local and regional mitigation and preparedness activities.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Lower Colorado River Basin
<b>History of Damages:</b>	<p>A major challenge faced by communities seeking comprehensive hazard mitigation planning solutions is securing funds in an era of constrained resources at all levels of government. A wide range of financial and technical assistance is available from the State of Texas and the Federal Government to protect communities from floods and other natural and man-made disasters and preserve the quality of water in the Lower Colorado River and its tributaries.</p> <p>Appendix B of this Plan contains a Guide to Funding and Technical Assistance Programs That Support Hazard Mitigation. This Guide is a tool to use in leveraging State and Federal resources to protect residents of the basin from the ravages of natural and man-caused disasters and enhance water quality. To assist in leveraging resources, this Guide will be updated annually as changes are made in funding programs or as new funding programs become available.</p>

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Priority (High, Moderate, Low):</b>	Medium
<b>Estimated Cost:</b>	The Funding Guide will be updated annually, starting in 2004. The Lower Colorado River Authority will work with the Coalition members to continually leverage external resources, starting in 2004 and ending in 2009.
<b>Potential Funding Sources:</b>	Lower Colorado River Authority
<b>Lead Agency/Department Responsible:</b>	Lower Colorado River Authority.
<b>Implementation Schedule:</b>	N/A
<b>2009 Analysis:</b>	
This action will be deleted. There was not enough interest in this action by jurisdictions to warrant inclusion of the action in the 2009 Plan	

<b>LCRA (Past Action)-5</b>	
<b>Proposed Action:</b>	<p><b>Strengthen the cooperative technical partnership with FEMA, the Department of Homeland Security.</b></p> <p><b>Improve local-Federal understanding and cooperation with regard to disaster damage-reduction activities.</b></p> <p><b>Reduce length of time for accomplishing tasks such as flood mapping.</b></p>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Lower Colorado River Basin
<b>History of Damages:</b>	<p>The Lower Colorado River Authority is a Cooperating Technical Partner of the Federal Emergency Management Agency in the conduct of floodplain-mapping activities. Under the auspices of the CTP program, LCRA and FEMA have partnered to complete an assessment of mapping needs and deficiencies in the basin; complete a pilot project for the City of Lago Vista to produce digital FIRMs; develop a Map Master Plan which sets priorities for the production of new maps; and produce new maps for the region. This action will continue and strengthen the cooperative technical partnership with FEMA.</p>

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Priority (High, Moderate, Low):</b>	Medium
<b>Estimated Cost:</b>	\$6,000, exclusive of grants
<b>Potential Funding Sources:</b>	Federal Emergency Management Agency Map Modernization Funds, Lower Colorado River Authority, local funding.
<b>Lead Agency/Department Responsible:</b>	Lower Colorado River Authority.
<b>Implementation Schedule:</b>	This is an on-going activity that will be conducted from 2003 to 2008.
<b>2009 Analysis:</b>	
<p>This action has been completed. MapMod will be finished by the end of 2009 and some local funding was incorporated into several projects including, but not limited to: Wharton County, Colorado County and Bastrop County.</p>	

## New Actions

### TCRFC

TCRFC-1	
<b>Proposed Action:</b>	<b>Determine inundation areas and mitigate high hazard structures (500-year floodplain can be used as a general guide for areas of inundation) downstream of all dams.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin Wide
<b>History of Damages:</b>	The potential for dam failure exists throughout the basin. Many dams are privately owned and have become a high hazard dam over the years due to downstream development.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Dam Failure
<b>Effect on new/existing buildings:</b>	Determining inundation areas exactly will help the development of new buildings in risk-averse areas.
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	TCEQ and Local communities
<b>Implementation Schedule:</b>	Begin 2009 – Future

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Develop emergency action plan in the event of an area dam failure. Update new TCEQ rules and conduct drills.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	The potential for dam failure exists throughout the basin. Many dams are privately owned and have become a high hazard dam over the years due to downstream development.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Dam Failure
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	TCEQ, Local Departments of Emergency Management
<b>Implementation Schedule:</b>	2009-2011

<b>COMMENTS</b>

<p><b>Proposed Action:</b></p>	<p><b>Develop an enforcement plan for implementing mandatory water rationing; lawn watering restrictions; excess-use charges during times of water shortage.</b></p>
<p><b>BACKGROUND INFORMATION</b></p>	
<p><b>Site and Location:</b></p>	<p>Basin wide</p>
<p><b>History of Damages:</b></p>	<p>Due to continued increase in population throughout the lower Colorado river basin, water will continue to be in high demand, especially during particularly dry periods.</p>

<p><b>MITIGATION ACTION DETAILS</b></p>	
<p><b>Hazard(s) Addressed:</b></p>	<p>Drought</p>
<p><b>Effect on new/existing buildings:</b></p>	<p>Water shortage and drought can result in foundation problems for existing structures and this action helps to mitigate against that effect.</p>
<p><b>Priority (High, Moderate, Low):</b></p>	<p>Moderate</p>
<p><b>Estimated Cost:</b></p>	<p>Unknown</p>
<p><b>Potential Funding Sources:</b></p>	<p>Federal and State Grants</p>
<p><b>Lead Agency/Department Responsible:</b></p>	<p>TWDB/LCRA/Local communities</p>
<p><b>Implementation Schedule:</b></p>	<p>2009 and continuing into the future</p>

<p><b>COMMENTS</b></p>
<p> </p>

<b>Proposed Action:</b>	<b>Educate residents about Xeriscape planting.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Due to continued increase in population throughout the lower Colorado river basin, water will continue to be in high demand, especially during dry periods. Planting native plants have been proven to save water and are more resistant to extended drought periods.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$10,000 for publishing brochures on Xeriscaping, but education campaign will need to be on-going
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>		<b>Provide water conservation education to residents and farmers (ex. drip irrigation, soil moisture monitoring, and tillage practices).</b>
<b>BACKGROUND INFORMATION</b>		
<b>Site and Location:</b>	Basin wide	
<b>History of Damages:</b>	Due to continued increase in population throughout the lower Colorado river basin, water will continue to be in high demand, especially during particularly dry periods.	

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought
<b>Effect on new/existing buildings:</b>	Water conservation and soil monitoring will help determine threats to existing buildings in terms of foundation problems.
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$10,000 for publishing brochures, but education campaign will need to be on-going
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Expand rainfall observer program utilizing volunteers through the National Weather Service’s CoCoRAHS program.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Continued data gathering during rain events is critical to ensuring flood models are accurate for the next event. The best way to do this is to gather data of what is actually happening on the ground. Rain gauges only measure a tiny spot in the basin and are costly to maintain.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	None *
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	TCRFC
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>
<p>* Note: Costs may be incurred if Coalition purchases CoCoRAHS approved rain gauges for communities.</p>

<b>Proposed Action:</b>	<b>Identify sites where stream and rain gauges need to be added or upgraded and coordinate installation requests with the USGS and Lower Colorado River Authority.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Flooding cannot be prevented, but more adequate warning may be given to residents downstream if stream gauges are installed in more locations.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

	<b>Proposed Action:</b>	<b>Implement flood early warning system and response plan.</b>
<b>BACKGROUND INFORMATION</b>		
	<b>Site and Location:</b>	Basin wide
	<b>History of Damages:</b>	A response plan allows communities to act quickly and professionally in a time of high stress. Flooding cannot be prevented, but more adequate warning may be given to residents downstream if an early warning system exists.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	This action mitigates against potential injury and death rather than property damage.
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 to 2011

<b>COMMENTS</b>
Continued response plan training will be required by all communities to ensure adequate continuing preparedness level.

<b>Proposed Action:</b>	<b>Track and record high water marks following a flood.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Flooding has been an ongoing problem in the basin. High water marks have helped in the past to improve flood models and help the public get a visual of how high the water got during certain floods.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$5,000 for bench marks **
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	LCRA / Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>
**Note: The Coalition already has purchased a number of brass benchmarks that can be used by communities for future flood events to mark high water levels.

<b>Proposed Action:</b>	<b>Encourage floodplain coordinators to become CFMs.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Improper development in the floodplain can be prevented through educating floodplain coordinators and ensuring they are certified floodplain managers (CFMs).

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	New buildings will be properly built according to NFIP standards
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	One time \$100 exam fee per floodplain coordinator and continued TFMA annual membership
<b>Potential Funding Sources:</b>	Local Funds
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>
Due to high turnover rate in the floodplain management field, it will be critical to ensure every new floodplain coordinator has the opportunity to become certified.

<b>Proposed Action:</b>		<b>Adopt ASFPM’s (Association of State Floodplain Managers) “No Adverse Impact” (NAI) policy to mitigate local flooding.</b>
<b>BACKGROUND INFORMATION</b>		
<b>Site and Location:</b>	Basin wide	
<b>History of Damages:</b>	Development has an impact up-and downstream. No Adverse Impact mitigates those impacts	

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	Adopting NAI will encourage the development of new buildings outside flood-prone areas and also mitigate against damage to existing buildings that are up or downstream of flood zones.
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	No Cost
<b>Potential Funding Sources:</b>	N/A
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Cross train building inspectors in floodplain management requirements</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Building inspectors are often not in contact with the floodplain administrators, even though inspectors are the ones who are out in the field and can catch violations and ensure that new structures are built in accordance with the NFIP regulations.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	Enhanced compliance with the NFIP through continued inspections
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Staff time to train
<b>Potential Funding Sources:</b>	Local Funds
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on to ensure new staff is continuously trained

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Ensure public has access to local FIRMs and flood map ordering information.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	An educated public is a safer public. Potential buyers may think twice about purchasing an existing home in the floodplain and/or may decide to build on a different area of their new land to ensure the structure is outside the designated floodplain.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	New buildings will be built outside the designated floodplain or properly elevated if located in the floodplain
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	No cost except staff time to ensure maps remain current and available to the public
<b>Potential Funding Sources:</b>	Local Funds
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<p><b>Proposed Action:</b></p>	<p><b>Place flood insurance materials/mortgage lending mandates in libraries.</b></p>
<p><b>BACKGROUND INFORMATION</b></p>	
<p><b>Site and Location:</b></p>	<p>Basin wide</p>
<p><b>History of Damages:</b></p>	<p>An educated public is a safer public. These materials allow the public to be aware of regulations and to make wiser decisions on where to build and what their insurance options are.</p>

<p><b>MITIGATION ACTION DETAILS</b></p>	
<p><b>Hazard(s) Addressed:</b></p>	<p>Flood</p>
<p><b>Effect on new/existing buildings:</b></p>	<p>n/a</p>
<p><b>Priority (High, Moderate, Low):</b></p>	<p>Moderate</p>
<p><b>Estimated Cost:</b></p>	<p>No cost except staff time to ensure information remains current and available to the public</p>
<p><b>Potential Funding Sources:</b></p>	<p>Local Funds</p>
<p><b>Lead Agency/Department Responsible:</b></p>	<p>Local Communities</p>
<p><b>Implementation Schedule:</b></p>	<p>2009 and on</p>

<p><b>COMMENTS</b></p>
<p> </p>

<b>Proposed Action:</b>	<b>Use impact fees to help fund public hazard mitigation projects related to land development (i.e. increased runoff).</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Impervious cover changes the flow of water, increases runoff and can potentially cause homes to flood that have never flooded before.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	Existing and new homes will be safer from flooding
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Impact Fees paid by land developers
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Identify repetitive loss properties for future Hazard Mitigation Grant Program funding.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Repetitive loss properties exist throughout the basin and cause a drain on the flood insurance pool as well as on local resources and federal assistance dollars.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	Existing repetitive loss properties may be bought out
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	HMGP Funds
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>
Communities to apply for HMGP funds after a federally declared disaster occurs.

<b>Proposed Action:</b>	<b>Include “cumulative damage” provisions in local floodplain management ordinances.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Properties that have minor damage after smaller events exist throughout the basin and cause a drain on the flood insurance pool as well as on local resources.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Staff time to record repetitive losses in permit file
<b>Potential Funding Sources:</b>	Local Funds
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Advertise and promote the ability of flood insurance and availability of the Preferred Risk Policy (PRP).</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Many home owners and especially renters do not know they qualify for flood insurance

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	More new and existing structures would be insured as a result of this action.
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$10,000 for publications ***
<b>Potential Funding Sources:</b>	State and Federal Grants
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>
***Note: Residents come and go; it will be important to continue these campaigns on a regular basis to ensure even the newest residents to the area are aware of the availability of flood insurance.

<b>Proposed Action:</b>	<b>Conduct workshops for local lending agencies, insurance agents, surveyors, and title companies to promote availability and understanding of flood insurance.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Insurance agents often tell their clients they cannot get flood insurance even though everyone is eligible. Surveyors, title companies, and lenders often also have incorrect information about the NFIP.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	This action would result in more accurate surveys and insurance policies for both new and existing buildings.
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	N/A
<b>Potential Funding Sources:</b>	NFIP training specialists
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Educate communities on dangers of low water crossings through the Turn Around Don't Drown (TADD) campaign.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Low water crossings are the number one killer during floods.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>
It is vital to inform the public on the dangers of driving through flowing waters and it will be critical to inform all new residents to the basin on a continuing basis.

<b>Proposed Action:</b>	<b>Educate policy holders and area insurance agents regarding ICC availability.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Many policy holders and insurance agents do not know about the availability of the Increased Cost of Compliance benefit covered under the National Flood Insurance Program's flood insurance policy.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	Existing buildings can be elevated with these funds after being substantially damaged or improved.
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	No cost to communities
<b>Potential Funding Sources:</b>	NFIP Training staff
<b>Lead Agency/Department Responsible:</b>	FEMA/NFIP Training staff
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Provide public awareness campaign on threats of extreme heat and tips on how to cope.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	An educated public is a safer public. Many people do not realize that extreme summer heat is now the number one killer in the Nation.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Extreme Heat
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown cost for publications
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>
It is critical to keep educating new residents to the area on a continued basis on the dangers of extreme summer heat.

<b>Proposed Action:</b>	<b>Establish cooling centers and emergency shelters for residents without air conditioning.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Extreme summer heat is now the number one killer in the nation. It is vital to have cooling centers available throughout communities to ensure residents with no air conditioning can seek shelter from the heat.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Extreme Heat
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Advertise and promote the availability or crop insurance.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Hail can cause disastrous damage to crops.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hail
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants, Local Funds
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Require hail resistant roofing products.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Hail can cause roofing damage throughout the basin.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hail
<b>Effect on new/existing buildings:</b>	New and existing buildings can be built more hail resistant. A hail resistant roof will mitigate against damage and also reduce the cost of insurance by decreasing claims for hail damage.
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	N/A
<b>Potential Funding Sources:</b>	N/A
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>
While requiring hail resistant roofing products may cost the owner more in the beginning, future damages will be avoided.

<b>Proposed Action:</b>	<b>Develop a local hazmat team.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	It is critical to be informed and prepared during an emergency that involved hazardous material.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hazardous Material Release
<b>Effect on new/existing buildings:</b>	n/a
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Grants and/or Local Funds
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

	<b>Proposed Action:</b>	<b>Develop mutual aid agreements between local emergency responders and corporate hazmat response teams.</b>
<b>BACKGROUND INFORMATION</b>		
	<b>Site and Location:</b>	Basin wide
	<b>History of Damages:</b>	Hazardous material spills may cross jurisdictional boundaries and/or the spill may be so large that the affected jurisdiction needs help coping with it.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hazardous Material Release
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	No Cost for just signing the agreement
<b>Potential Funding Sources:</b>	N/A
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Arrange hazmat training for local emergency responders from major transportation companies (like railroads).</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Major transportation companies often carry hazardous material and local hazmat responders can learn to deal with potential releases of hazardous materials from those companies.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hazardous Material Release
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	N/A
<b>Potential Funding Sources:</b>	N/A
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<p><b>Proposed Action:</b></p>	<p><b>Study how hazardous materials are transported through communities. Implement re-routing of hazardous materials to alternate routes outside of community.</b></p>
<p><b>BACKGROUND INFORMATION</b></p>	
<p><b>Site and Location:</b></p>	<p>Basin wide</p>
<p><b>History of Damages:</b></p>	<p>Eliminating the potential threat hazardous materials may cause to the center of town is a prudent investment in a safer community.</p>

<p><b>MITIGATION ACTION DETAILS</b></p>	
<p><b>Hazard(s) Addressed:</b></p>	<p>Hazardous Material Release</p>
<p><b>Effect on new/existing buildings:</b></p>	<p>N/A</p>
<p><b>Priority (High, Moderate, Low):</b></p>	<p>Moderate</p>
<p><b>Estimated Cost:</b></p>	<p>Unknown</p>
<p><b>Potential Funding Sources:</b></p>	<p>Federal and State Grants</p>
<p><b>Lead Agency/Department Responsible:</b></p>	<p>Local Communities</p>
<p><b>Implementation Schedule:</b></p>	<p>2009 and on</p>

<p><b>COMMENTS</b></p>
<p> </p>

<b>Proposed Action:</b>	<b>Create and practice neighborhood and community plans with drills and exercises.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	An informed and prepared public is a safer public.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hazardous Material Release
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	N/A
<b>Lead Agency/Department Responsible:</b>	Local Emergency Management Teams
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Educate the public about hazardous materials and household hazardous waste to ensure collection and proper disposal.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	An educated public is a safer public. Many people do not realize the dangers of the chemicals they use every day in their homes.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hazardous Material Release
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	N/A
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Educate public about hazmat safety risks, detecting an accident, responding to an accident, evacuation, and shelter-in-place training.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	An educated public is a safer public and potentially prevent a worse spill of hazardous materials if they know what to look for and who to contact quickly.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hazardous Material Release
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants, Local Funds
<b>Lead Agency/Department Responsible:</b>	Local Emergency Management Teams
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Mandate use of steel connectors in new and existing construction. Install retrofits (reinforcement, flood proofing, storm shutters, bracing, etc.).</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Hurricane winds have caused much damage, especially in the lower basin area.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hurricane and Tropical Storm
<b>Effect on new/existing buildings:</b>	This action would result in retrofitting buildings, making them more resistant to natural hazards. For new buildings, this would result in building to a higher standard, mitigating against damage and reducing the cost of insurance.
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	N/A
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>
While the mandated steel connectors may cost more to install, it will keep the structure safer during a wind event. Retrofitting a structure can prevent it from incurring potentially devastating damage during a hurricane.

<b>Proposed Action:</b>	<b>Study hazardous areas and relocate structures out of those hazard areas.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Many structures are currently located in high hazard zones, especially along the coast.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hurricane and Tropical Storm
<b>Effect on new/existing buildings:</b>	Relocate existing high hazard area buildings to lower hazard areas.
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Create a hurricane hazard information center.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	It is critical to be informed and prepared for the next hurricane.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hurricane and Tropical Storm
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Grants and/or Local Funds
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Secure traffic lights and install resilient street signs and traffic controls to avoid impeding evacuations.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Evacuations can be impeded by non-functioning traffic signs and signals.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hurricane and Tropical Storm
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants, Local Funds
<b>Lead Agency/Department Responsible:</b>	Local Departments of Transportation
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Study and implement a system for early leak detection and accidents to protect those most at risk.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Underground pipelines can leak and cause environmental harm without being detected right away.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Pipeline Failure
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

	<b>Proposed Action:</b>	<b>Provide safety procedures to builders and developers for building and operating near hazardous pipelines. Ensure that the location of hazardous material sites and pipelines are readily available to builders.</b>
<b>BACKGROUND INFORMATION</b>		
	<b>Site and Location:</b>	Basin wide
	<b>History of Damages:</b>	Builders and developers can be safer in the field if they know where hazardous pipelines are located.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Pipeline Failure
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Safety staff time to track hazardous pipelines
<b>Potential Funding Sources:</b>	Local Funds
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>
<p>The US Department of Transportation regulates pipelines and may have information and requirements in place. Coordination will be essential so that efforts are not duplicated.</p>

	<b>Proposed Action:</b>	<b>Incorporate a Hazardous Pipeline Ordinance: adequate insurance pertaining to potential hazardous incidents, penalties for non-compliance, restricting certain uses within 200 feet, etc.</b>
<b>BACKGROUND INFORMATION</b>		
	<b>Site and Location:</b>	Basin wide
	<b>History of Damages:</b>	A community that is aware of the potential dangers can be more prepared—an Ordinance should ensure this.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Pipeline Failure
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Staff time to prepare the ordinance
<b>Potential Funding Sources:</b>	N/A
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Implement a back-up plan for storing public records and digital copies off-site in a low-hazard area</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Critical information needs to be stored in a secondary location to ensure no records and vital data is lost.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Terrorism
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Develop alternative energy sources in the event of a utility or petroleum shortage.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Natural disasters in the past have proven it to be vital to have back-up energy sources. The same would apply in the event of a terrorist attack.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hazardous Material Release
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants, Local Funds
<b>Lead Agency/Department Responsible:</b>	Local Emergency Management Teams
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Conduct vulnerability assessment of local water supply and water treatment systems.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Water supply and water treatment facilities are vital infrastructure that needs to be protected and hardened, if possible.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Terrorism
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Obtain certification of communities by the National Weather Service as “Storm Ready” communities.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	A community that is ready for the next storm is a prepared community and can be safer.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Thunderstorms
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Staff time to gather information and submit application for certification
<b>Potential Funding Sources:</b>	Local Funds
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on****

<b>COMMENTS</b>
<p>****Note: The NWS Storm Ready program requires re-certification every three years and an annual visit to the NWS regional office, thus some staff time will be required to maintain the certification.</p>

<b>Proposed Action:</b>	<b>Establish a post-event debris-management plan.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Thunderstorms can be quite violent in the lower Colorado river basin and debris such as fallen limbs may need to be removed from an affected area.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Thunderstorms
<b>Effect on new/existing buildings:</b>	After a storm event, those buildings not affected by the hazard itself, can still be damaged due to debris that has built up, causing future flood damage. This action would provide for efficient cleanup, mitigating against damage to existing buildings and encourage the development of new buildings.
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Staff time to create the plan
<b>Potential Funding Sources:</b>	Local Funds
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Establish pre-disaster debris management contracts.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	It is critical to manage debris in any disaster so that citizens can rebuild and return to normal as quickly as possible.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Tornadoes
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants, Local Funds
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Require “safe rooms” to be added when constructing new schools, daycares, retirement homes, and critical care facilities.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Many structures that hold a potentially large amount of people currently do not have safe rooms.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Tornadoes
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown****
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>
<p>****Note: although safe rooms are an added expense to construction, they are deemed to save lives and make communities safer for residents. It is especially critical to ensure vulnerable populations like children and the elderly are protected.</p>

<b>Proposed Action:</b>	<b>Require mobile home parks to provide safe storm shelters.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Mobile home parks are areas of highest risk in tornado prone areas.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Tornadoes
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009-2013

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Mandate and inspect to ensure standard tie-downs are properly fastened on mobile homes.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Mobile homes are at the greatest risk of being completely destroyed in the event of a tornado due to their lack of a solid foundation.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Tornadoes
<b>Effect on new/existing buildings:</b>	This would strengthen current mobile homes which are susceptible to damage during tornado events.
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Staff time to inspect tie-downs
<b>Potential Funding Sources:</b>	Local Communities
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Conduct public education program on fire risks and wild land fire mitigation, with the assistance of the Texas Forest Service.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Many residents are unaware of the dangers of wild land fires and continued construction in wild lands places more people at risk of wildfires.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Wildfire
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Develop a comprehensive wild land fire hazard and fuels management plan. Create a wildfire recovery plan, including soil erosion control, and vegetative recovery.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Many communities have no plan in place on how to deal with potentially catastrophic wildfires in their community.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Wildfire
<b>Effect on new/existing buildings:</b>	This would identify wildland interface areas and prevent the development of new buildings in high hazard areas, as well as provide mitigation techniques for reducing or eliminating damage for existing buildings.
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Staff time to develop plan
<b>Potential Funding Sources:</b>	Local Funds
<b>Lead Agency/Department Responsible:</b>	Local Emergency Management Teams
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Ensure area fire fighters are properly trained in wild land fire fighting.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	A wildfire can be very dangerous and it is critical for firefighters to be trained in the potential dangers of a wildfire.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Wildfire
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Local Funds
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Bury utility lines to prevent ice build-up.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Many power outages during winter storms are caused by sagging tree limbs lying over power lines.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Winter Storms
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Research alternate sources for farmers to acquire additional feed and adequate shelter for livestock.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Livestock can be lost during extended winter storms if there is no adequate food or shelter present.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Winter Storms
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants, Local Funds
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>Proposed Action:</b>	<b>Ensure adequate supply of snow and ice removal equipment and supplies.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Many communities have been caught unprepared to deal with extended winter storms.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Winter Storms
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants, Local Funds
<b>Lead Agency/Department Responsible:</b>	Local Communities
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

**LCRA**

<b>LCRA-1</b>	
<b>Proposed Action:</b>	<b>Develop an enforcement plan for implementing mandatory water rationing; lawn watering restrictions; excess-use charges during times of water shortage.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	LCRA service area
<b>History of Damages:</b>	Due to continued increase in population throughout the lower Colorado river basin, water will continue to be in high demand, especially during particularly dry periods.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	LCRA
<b>Implementation Schedule:</b>	2009 and continuing into the future

<b>COMMENTS</b>

<b>LCRA-2</b>	
<b>Proposed Action:</b>	<b>Update current emergency action plan per TCEQ rules for dam failure and conduct a drill.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	LCRA service area
<b>History of Damages:</b>	The potential for dam failure exists throughout the basin. Many dams are privately owned and have become a high hazard dam over the years due to downstream development.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Dam Failure
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	TCEQ, LCRA Department of Emergency Management & Dam Safety
<b>Implementation Schedule:</b>	2009-2011

<b>COMMENTS</b>

<b>LCRA-3</b>	
<b>Proposed Action:</b>	<b>Identify sites where stream and rain gauges need to be added or upgraded and coordinate installation requests with the USGS and Lower Colorado River Authority. Harden existing gauges against flood damages.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	LCRA service area
<b>History of Damages:</b>	Flooding cannot be prevented, but more adequate warning may be given to residents downstream if stream gages are installed in more locations. It is critical that these gages function even during a large flood.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	LCRA
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>

<b>LCRA-4</b>	
<b>Proposed Action:</b>	<b>Track and record high water marks following a flood.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	LCRA service area
<b>History of Damages:</b>	Flooding has been an ongoing problem in the basin. High water marks have helped in the past to improve flood models and help the public get a visual of how high the water got during certain floods.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$5,000 for bench marks *
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	LCRA
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>
<p>*Note: The Coalition already has purchased a number of brass benchmarks that can be used by communities for future flood events to mark high water levels. LCRA may be able to use them as well.</p>

<b>LCRA-5</b>	
<b>Proposed Action:</b>	<b>Support education of citizens on dangers of low water crossings through the Turn Around Don't Drown (TADD) campaign.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	LCRA service area
<b>History of Damages:</b>	Low water crossings are the number one killer in floods and educating the general public on the dangers of them may help reduce the number of fatalities.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$10,000 for publications, etc.
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	LCRA
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>
<p>It will be vital to inform the public on a continuing basis, not just once. Many new residents move into areas prone to flash flooding and low water crossing publications will need to be maintained and more money will be needed in the future.</p>

<b>LCRA-6</b>	
<b>Proposed Action:</b>	<b>During or following a flood event, LCRA may have to rebuild any number of its 262 Hydro meteorological gauging stations damaged or compromised in the flood event.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	The LCRA Hydromet gage network is located across the Colorado River basin and in some cases, adjacent river basins.
<b>History of Damages:</b>	Gauging stations have been damaged historically due to flood waters inundating the equipment, wind damage, or lightning damage.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Unknown
<b>Potential Funding Sources:</b>	Federal and State Grants
<b>Lead Agency/Department Responsible:</b>	LCRA
<b>Implementation Schedule:</b>	2009 and continuing into the future

<b>COMMENTS</b>
<p>The Hydromet network plays a central part in LCRA success in managing the lake and river system during routine conditions, floods, and droughts. In recent years, data from the Hydromet system has come to be indispensable to external customers such as local floodplain administrators, local Emergency Managers, National Weather Service flood forecasters, the U.S. Geological Survey, media, and the general public. The Hydromet system is considered critical infrastructure and damage to the system could increase the risk of health and property loss by the public.</p>

<b>LCRA-7</b>	
<b>Proposed Action:</b>	<b>Implement a volumetric measurement system in the Garwood Irrigation Division. The measurement process would allow LCRA to charge for water based on the acre-feet of water used.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Garwood Irrigation Division
<b>History of Damages:</b>	Measuring water use at all farm turnouts in the Garwood Irrigation Division and billing based on those measurements would promote water conservation by sending a price signal to irrigation water contract holders. It would also increase overall system water management efficiency and improve response capability in times of floods by allowing for additional control and shut-off capacity of the irrigation canals.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$973,500
<b>Potential Funding Sources:</b>	Grants; TWDB; USBR
<b>Lead Agency/Department Responsible:</b>	LCRA River Operations
<b>Implementation Schedule:</b>	2009 to 2011

<b>COMMENTS</b>
With cost share funding, billing based on water use can be implemented by 2011. LCRA is also pursuing other grant opportunities and is willing to provide a 50% cost share for this project.

<b>LCRA-8</b>	
<b>Proposed Action:</b>	<b>Develop incentive programs for residential and commercial customers to install water efficient equipment to reduce water demand.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	LCRA wholesale municipal water customers have no incentive programs in place to encourage customers to replace high water use appliances and fixtures with water efficient equipment. Water efficient equipment, such as high efficiency toilets, will maintain its water savings over time, which will help to ensure a reliable water supply when a drought occurs.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought
<b>Effect on new/existing buildings:</b>	Retrofit program would have some effect on existing buildings
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Approximately \$275,000
<b>Potential Funding Sources:</b>	Grants
<b>Lead Agency/Department Responsible:</b>	LCRA Water Use and Conservation
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>
<p>The estimated cost reflects a multi-faceted incentive program that would address indoor, outdoor, residential and commercial inefficiencies. If funding is available, incentive programs can be relatively easy to implement and expanded as resources allow.</p>

<b>LCRA-9</b>	
<b>Proposed Action:</b>	<b>Develop a web-based tool to calculate water use and savings from the implementation of conservation measures, efficiency standards, and water-wise practices for residential and commercial customers.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Basin wide
<b>History of Damages:</b>	Many customers are unaware of how much water they consume and as a result, are less likely to conserve. By equipping them with information on consumption and savings measures, customers will be able to make informed decisions to increase their water use efficiency. The resulting behavior modifications and efficiency improvements would help to ensure a reliable water supply when a drought occurs.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Approximately \$10,000
<b>Potential Funding Sources:</b>	Grants
<b>Lead Agency/Department Responsible:</b>	Water Use and Conservation
<b>Implementation Schedule:</b>	2009 and on

<b>COMMENTS</b>