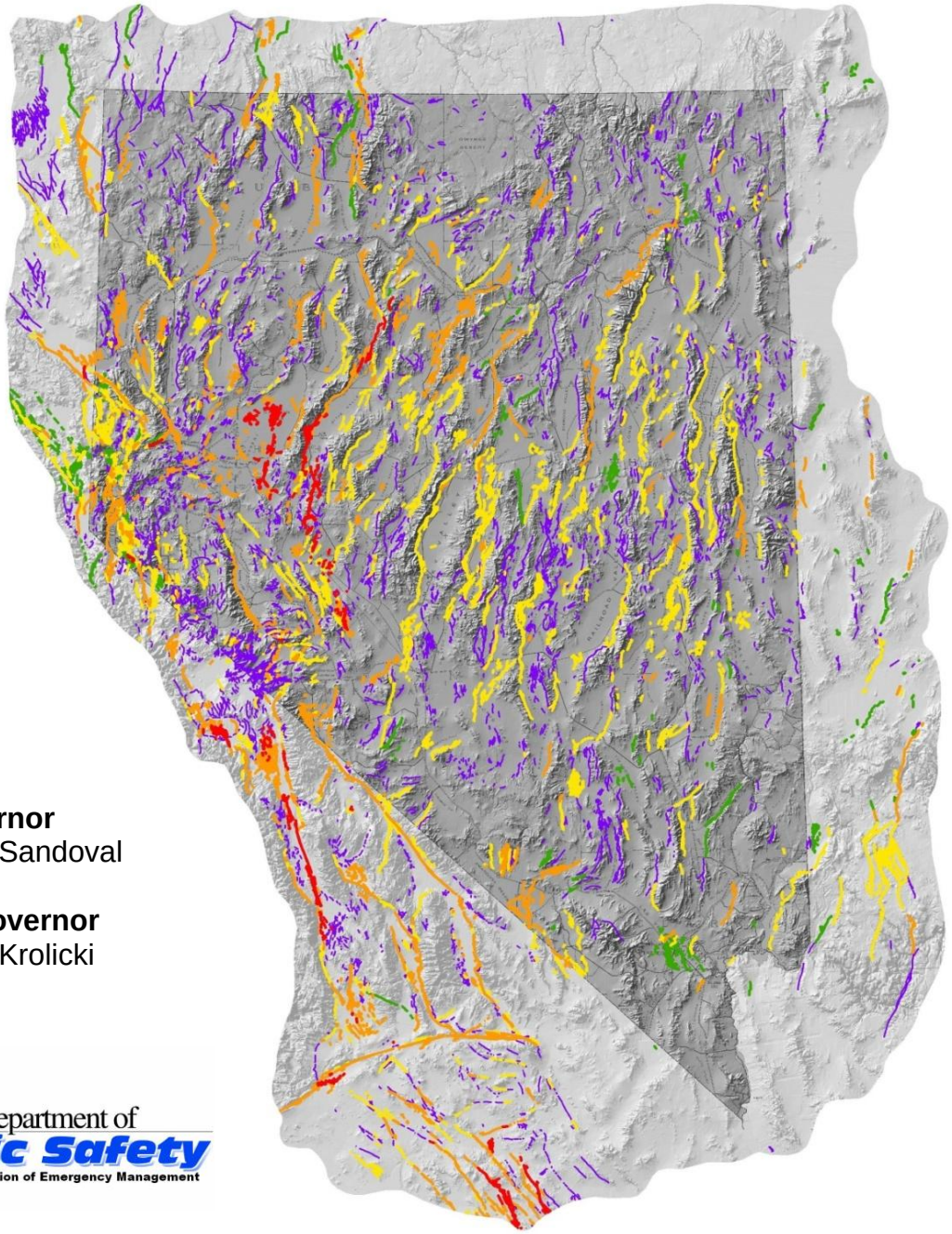
The State of Nevada
Enhanced Hazard Mitigation Plan

October 2013



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Executive Summary

This State Enhanced Hazard Mitigation Plan (SHMP) is the official statement of Nevada's statewide hazard mitigation goals, strategies, and priorities. Hazard mitigation can be defined as any action taken to reduce or eliminate long-term risk to life and property from natural and human-caused disasters.

The standard version of the SHMP was originally submitted by the Nevada Division of Emergency Management (NDEM) and approved by FEMA in 2004; it was updated in 2007, updated and enhanced in the 2010 iteration. Since 2010, the Nevada Hazard Mitigation Planning Committee (NHMPC), NHMPC Planning Subcommittee, NDEM staff Nevada Bureau of Mines and Geology staff at the University of Nevada Reno contributed to the current 2013 update of the Enhanced State Hazard Mitigation Plan (SHMP).

The Division of Emergency Management created the Nevada Hazard Mitigation Planning Committee in 2003 to support the development and implementation of the first State Hazard Mitigation Plan. Initially, members were tasked with directing the planning process and the review and approval of the resulting draft document. Since its formation, the Committee has expanded and currently promotes the development of hazard plans and public awareness of mitigation activities in Nevada's communities throughout the state. Other responsibilities include the review and prioritization of mitigation activities presented by state and local agencies to the Division of Emergency Management and the Division of Water Resources for funding under the Unified Hazard Mitigation Assistance programs, promoting land use regulations and providing technical assistance and data for the development of the state and local planning efforts. The Committee meets quarterly, with special meetings scheduled as necessary. Prior to November 2009, meetings were held alternately in the City of Reno (north) and the City of Las Vegas (south). However, since the beginning of the 2010 calendar year, the NHMPC members agreed to hold meetings around the state in an effort to provide current information about hazards, mitigation efforts, and funding opportunities to the communities hosting the meetings and to learn about the concerns of those communities regarding hazards, capabilities, and resiliency.

The Planning Subcommittee was created to allow greater flexibility for stakeholder participation in the planning process. Representatives from state, local and tribal agencies were invited to participate in the process via email from the Division of Emergency Management on behalf of the NHPC. Invitations were sent in January of 2011 as the 2013 update of the plan began. The Subcommittee invited participation from experts in different fields based on the hazards being addressed. The Subcommittee established a Planning Team to coordinate the data compilation and to implement the proposed updates of the plan document.

The Planning Team consists of four people gathering the information and incorporating it into the draft plan document: the SHMO, a mitigation specialist, a geologist/editor from the Nevada Bureau of Mines & Geology, University of Nevada, Reno, and a data processing specialist.

Each draft section was distributed via email and posted on the NHMPC and DEM website for review by the Subcommittee members with a request for feedback and distributed to other agencies with expertise in each of the hazards. Any feedback was incorporated into the appropriate draft section revision by the Planning Team members, which was then

reposted on the website and sent again via email to members for their review and comment prior to presenting drafts for the Subcommittee to make recommendations to NHMPC. The Subcommittee meetings take place one month before the full NHMPC meetings to allow the review and contribution by the NHMPC members of all updates before approval of the drafts is placed for approval on its agendas. Public comment is possible through the NDEM and NHMPC websites for any and all portions of the plan posted. The mitigation planning process at the state level is continuous; the compilation and sharing of data, integration, and implementation of the plan begins immediately upon submission to FEMA for review.

All sections of the 2013 Enhanced Plan were reviewed by the Subcommittee and the Planning Team; modifications were made to each and every section of the plan with current information, new maps, additional hazard data, tabulation of data, and integration of local plans. The NHMPC reviewed and approved the final drafts of all sections and appendices of the updated plan. The NHMPC is confident of the integration of local and regional planning efforts into the State plan and the capability of the State to implement its strategies, assess their effectiveness and modify those strategies as necessary to accomplish the plan's goals.

The most important parts of the plan are contained in Sections Three and Section Four. Section Three contains the five elements of the Risk Assessment process:

- Identifying and screening the hazards faced by the State
- Profiling those hazards
- Identifying the assets at risk
- Assessing the vulnerabilities and finally
- Analyzing potential losses due to the major hazards in the state

Much of the work of the Planning Subcommittee was spent in compiling this information, which has been expanded with more detail and member input since the last iteration.

Section Four describes the State's mitigation goals and resultant selection of mitigation activities to achieve those goals, which constitute the State's Mitigation Strategy. While the overall goals have not changed since the last iteration, some of the strategic actions have been modified, added, or deleted to correspond with those of member agencies.

The NHMPC and NDEM acknowledge the numerous local, state, federal and tribal groups, agencies and their representatives who patiently provided their time, effort, and resources to make this a truly Enhanced Plan. There are too many to list all contributors without omitting someone whose help was invaluable, so please know that your assistance is greatly appreciated.

Table of Contents 2013

Title Page

Executive Summary

Section 0 Overview of Plan 0-1

0.1 OVERVIEW OF PLAN CONTENTS 0-1

0.2 STATE PROFILE 0-2

0.2.1 Economy 0-2

0.2.2 Physical Geography 0-5

0.2.3 Climate 0-6

0.2.4 Temperature 0-6

0.2.5 Precipitation 0-6

0.2.6 Population 0-6

0.3 LAND MANAGEMENT AND JURISDICTION 0-10

Section 1 Official Record of Adoption 1-1

1.1 DISASTER MITIGATION ACT OF 2000 1-1

1.2 PLAN ADOPTION PROCEDURES 1-1

1.2.1 State Authority 1-2

1.2.2 Nevada Revised Statutes (NRS) 1-2

1.2.3 Legislative Process 1-8

1.2.4 Assurances to Comply w/Federal Laws & Regulations 1-8

Section 2 Planning Process 2-1

2.1 OVERVIEW OF THE PLANNING PROCESS 2-1

2.1.1 How the Updated Plan was Prepared 2-1

2.1.2 Who Was Involved in the NHMP Update Process 2-2

2.1.3 How Other Agencies Participated in the Update 2-5

2.1.4 How Subcommittee Updated each NHMP Section 2-7

2.1.5 Which Sections of the NHMP Were Revised 2-15

2.2 COORDINATION AMONG AGENCIES 2-16

2.2.1 Involvement of Federal & State Agencies 2-16

2.2.2 Participation of Interested Groups 2-17

2.2.3 Changes in Federal and State Coordination 2-18

Table of Contents 2013

2.2.4 Silver Jackets Program 2-19
2.3 PROGRAM INTEGRATION 2-20
2.3.1 Integration of Existing Plans 2-20
2.3.2 Implementation of State Mandates at Local Level ... 2-23
2.3.3 Integration with FEMA Programs & Initiatives 2-23
Section 3 Risk Assessment 3-1
3.1 OVERVIEW OF RISK ASSESSMENT 3-1
3.2 NEVADA'S RISK ASSESSMENT PROCESS 3-2
3.2.1 Identifying and Screening Hazards 3-2
3.2.2 Prioritization of Hazards 3-5
3.2.3 Categorization of Screened Hazards 3-7
3.3 PROFILING HAZARDS 3-9
3.3.1 Avalanche 3-10
3.3.1.1 Nature 3-10
3.3.1.2 History 3-10
3.3.1.3 Location, Severity, and Probability of Future Events 3-12
3.3.2 Drought 3-14
3.3.2.1 Nature 3-14
3.3.2.2 History 3-16
3.3.2.3 Location, Severity, and Probability of Future Events 3-17
3.3.3 Earthquakes 3-18
3.3.3.1 Nature 3-18
3.3.3.2 History 3-21
3.3.3.3 Location, Severity, and Probability of Future Events 3-27
3.3.4 Epidemic 3-32
3.3.4.1 Nature 3-32
3.3.4.2 History 3-34
3.3.4.3 Location, Severity, and Probability of Future Events 3-36
3.3.5 Expansive Soils 3-37
3.3.5.1 Nature 3-37
3.3.5.2 History 3-37

3.3.5.3 Location, Severity, and Probability of Future Events 3-39
3.3.6 Extreme Heat 3-39
3.3.6.1 Nature 3-39
3.3.6.2 History 3-40
3.3.6.3 Location, Severity, and Probability of Future Events 3-42
3.3.7 Floods 3-43
3.3.7.1 Nature 3-43
3.3.7.2 History 3-44
3.3.7.3 Location, Severity, and Probability of Future Events 3-63
3.3.7.3.1 Location 3-63
3.3.7.3.2 Severity 3-67
3.3.7.3.3 Reducing Flood Damage in Areas of High Flood Probability 3-69
3.3.8 Flooding due to Dam Failure 3-73
3.3.8.1 Nature 3-73
3.3.8.2 History 3-74
3.3.8.3 Location, Severity, and Probability of Future Events 3-76
3.3.9 Flooding Along Ditches and Canals 3-79
3.3.9.1 Nature 3-79
3.3.9.2 History 3-80
3.3.9.3 Location, Severity, and Probability of Future Events 3-81
3.3.10 Hail and Thunderstorms 3-81
3.3.10.1 Nature 3-82
3.3.10.2 History 3-83
3.3.10.3 Location, Severity, and Probability of Future Events 3-84
3.3.11 Hazardous Materials 3-85
3.3.11.1 Nature 3-85
3.3.11.2 Identification of Hazardous Materials Releases 3-86

3.3.11.3 History 3-89
3.3.11.4 Location, Severity, and Probability of Future Events 3-100
3.3.12 Infestation 3-102
3.3.12.1 Nature 3-102
3.3.12.2 History 3-102
3.3.12.3 Location, Severity, and Probability of Future Events 3-110
3.3.13 Land Subsidence and Ground Failure 3-110
3.3.13.1 Nature 3-110
3.3.13.2 History 3-112
3.3.13.3 Location, Severity, and Probability of Future Events 3-113
3.3.14 Landslide 3-113
3.3.14.1 Nature 3-113
3.3.14.2 History 3-114
3.3.14.3 Location, Severity, and Probability of Future Events 3-115
3.3.15 Severe Winter Storm and Extreme Snowfall 3-115
3.3.15.1 Nature 3-115
3.3.15.2 History 3-116
3.3.15.3 Location, Severity, and Probability of Future Events 3-118
3.3.16 Terrorism/Weapons of Mass Destruction 3-118
3.3.16.1 Nature 3-118
3.3.16.2 History 3-123
3.3.16.3 Location, Severity, and Probability of Future Events 3-123
3.3.17 Tornado 3-125
3.3.17.1 Nature 3-125
3.3.17.2 History 3-125
3.3.17.3 Location, Severity, and Probability of Future Events 3-126
3.3.18 Tsunami/Seiche 3-127
3.3.18.1 Nature 3-127

3.3.18.2 History 3-128
3.3.18.3 Location, Severity, and Probability of Future Events 3-130
3.3.19 Volcano 3-130
3.3.19.1 Nature 3-130
3.3.19.2 History 3-132
3.3.19.3 Location, Severity, and Probability of Future Events 3-133
3.3.20 Wildfire 3-134
3.3.20.1 Nature 3-135
3.3.20.2 History 3-136
3.3.20.3 Location, Severity, and Probability of Future Events 3-143
3.3.21 Windstorm-Severe 3-153
3.3.21.1 Nature 3-153
3.3.21.2 History 3-154
3.3.21.3 Location, Severity, and Probability of Future Events 3-162
3.4 RANKING OF HAZARDS BY COUNTIES AND TRIBES 3-163
3.5 VULNERABILITY ASSESSMENT 3-165
3.5.1 Overview 3-165
3.5.2 Analysis of State and Local Risk Assessment 3-165
3.5.3 State's Vulnerability Based on Local, County, and Tribal Assessments 3-168
3.5.4 State's Vulnerability in Terms of Jurisdictions Most Threatened & Vulnerable 3-169
3.5.5 Results of Changes in Development 3-170
3.6 ASSESSING VULNERABILITY OF STATE FACILITIES 3-171
3.6.1 Types of State-Owned or -Operated Facilities 3-172
3.6.2 Estimating Potential Losses by Jurisdiction 3-173
3.6.3 Estimating Potential Losses of State Facilities 3-173
3.6.3.1 Earthquake 3-174
3.6.3.2 Flood 3-175
3.6.3.3 Wildfire/Urban Interface Fires 3-175

3.6.3.4 Vulnerability of State Communication Facilities due to Earthquake, Flood, and Wildfire 3-176
3.7 VULNERABILITY ASSESSMENT AND ANALYSIS OF POTENTIAL LOSSES 3-177
3.7.1 Earthquake.....3-177
3.7.2 Flood 3-184
3.7.3 Wildfire 3-188

Section 4 Mitigation Strategy 4-1
4.1 HAZARD MITIGATION GOALS 4-2
4.1.1 Hazard Mitigation Goal Overview 4-2
4.1.2 Mitigation Goals, Objectives and Potential Actions 4-3
4.1.3 Goal Assessment and Updates 4-10
4.2 STATE CAPABILITY ASSESSMENT 4-14
4.2.1 Pre-Disaster Hazard Management 4-14
4.2.2 Policies Related to Development 4-31
4.2.3 Funding Capabilities 4-31
4.2.4 Hazard Management Capabilities Changes 4-31
4.3 LOCAL CAPABILITY ASSESSMENT 4-38
4.3.1 Local Capability Description 4-39
4.3.2 Local Capabilities General Analysis 4-41
4.4 MITIGATION ACTIONS 4-44
4.4.1 Cost Effective, Environmentally Sound.....4-44
4.4.2 Evaluation of Actions and Activities.....4-44
4.4.3 Actions and Projects in Local Plans.....4-65
4.5 FUNDING SOURCES 4-66
4.5.1 Current Funding Sources 4-66
4.5.2 Potential Funding Sources 4-67
4.6 REPETITIVE LOSS AND SEVERE REPETITIVE LOSS 4-69
4.6.1 Goals that Support Mitigation Activities 4-70
4.6.2 Repetitive Loss and State & Local HM Policies 4-70
4.6.3 Repetitive Loss Properties In Risk Assessment 4-70
4.6.4 Mitigation Actions for Repetitive Loss Properties..... 4-71
4.6.5 Specific Actions Implemented to Mitigate RL Prop. .. 4-71
4.6.6 Funding for Repetitive Loss Properties 4-71

Table of Contents 2013

Section 5 Coordinating Local Mitigation Planning 5-1

5.1 LOCAL FUNDING AND TECHNICAL ASSISTANCE 5-1

5.1.1 Development of Local Mitigation Plans 5-1

5.1.1.1 Identification and Notification 5-6

5.1.1.2 Application Procedures 5-9

5.1.2 Funding & Technical Asst. for Past Three Years 5-9

5.2 LOCAL PLAN INTEGRATION 5-10

5.2.1 Process and Timeframe to Review Local Plans 5-11

5.2.2 Coordinate and Link Local Plans 5-11

5.3 PRIORITIZING LOCAL ASSISTANCE 5-13

5.3.1 Local Funding and Technical Assistance 5-13

5.3.1.1 Planning Review Ranking and Selection 5-13

5.3.1.2 Prioritization Evaluation 5-13

5.3.1.3 Prioritization Form 5-13

5.3.2 Cost Benefit Review of Proposed Projects 5-15

5.3.3 Highest Risk Communities 5-15

5.3.4 Repetitive Loss Properties 5-15

5.3.5 Intense Development Communities 5-15

Section 6 Plan Maintenance Process 6-1

6.1 MONITORING, EVALUATING AND UPDATING THE PLAN 6-1

6.1.1 Schedule for Monitoring, Evaluating and Updating the Plan 6-1

6.1.2 Method for Monitoring the Plan 6-1

6.1.3 Method for Evaluating the Plan 6-2

6.1.4 Method for Updating the Plan 6-3

6.1.5 Previous Process and Recommended Changes 6-3

6.2 MONITORING PROGRESS OF MITIGATION ACTIVITIES . 6-6

6.2.1 Monitor Progress of Mitigation Activities 6-6

6.2.2 Project Closeouts 6-7

6.2.3 Review Progress on Mitigation Strategy 6-7

6.2.4 Modifications in Tracking Mitigation Actions 6-8

6.2.5 Reviewing Progress on Implementing Activities 6-8

Table of Contents 2013

Section 7 References 7-1

7.1 REFERENCES 7-1

7.1.1 State Documents 7-1

7.1.2 Local Jurisdiction Documents 7-2

7.1.3 Other Documents 7-3

7.2 OTHER IMPORTANT LINKS 7-6

Section 8 Enhanced Plan Criteria Achievements Program 8-1

8.1 INTEGRATION WITH OTHER PLANNING INITIATIVES 8-1

8.1.1 Integration with Other Planning Initiatives 8-1

8.1.2 Integration with FEMA Programs 8-2

8.2 PROJECT IMPLEMENTATION CAPABILITY 8-3

8.2.1 Establishing Eligibility Criteria for Multi-Hazard Mitigation Measures 8-4

8.2.2 System to Determine the Cost Effectiveness of Mitigation Measures 8-9

8.2.3 System to Rank the Measures According to State 8-9

8.3 PROGRAM MANAGEMENT CAPABILITY 8-11

8.3.1 Effective Management of HMA Programs 8-12

8.3.2 Environmental Review and BCA 8-14

8.3.3 Quarterly Progress Reports and Monitoring 8-15

8.3.4 Mitigation Activities Completion and Closeout 8-15

8.4 ASSESSMENT OF MITIGATION ACTIONS 8-16

8.4.1 System and Strategy for the Assessment of Completed Mitigation Actions 8-17

8.4.2 Effectiveness of Mitigation Actions 8-17

8.5 EFFECTIVE USE OF AVAILABLE MITIGATION FUNDING 8-21

8.5.1 Effective Use of Available Mitigation Funding 8-21

8.5.2 Nevada's Effective Use of Existing Programs to Achieve Mitigation Goals 8-23

8.6 COMMITMENT TO A COMPREHENSIVE MITIGATION PROGRAM 8-27

8.6.1 Commitment to Support Local Mitigation Planning ... 8-27

8.6.2 Statewide Programs Promoting Hazard Mitigation .. 8-29

8.6.3 State Provision of a Portion of the Non-Federal

Match for Mitigation Projects 8-30
8.6.4 Promotion of Nationally Applicable Model Building Codes 8-31
8.6.5 Post-Disaster Mitigation of Building Risks 8-35
8.6.6 Integration of Mitigation w/Post-Disaster Recovery . 8-35

List of Appendices

Appendix A Adoption Resolution

Appendix B List of Participating Organizations

B.1 Nevada Earthquake Safety Council B-1

B.2 Nevada Local and Tribal Emergency Managers B-3

B.3 Wildland Urban Interface Fire Summit B-16

B.4 Preliminary Damage Assessment Team B-17

B.5 Nevada Fire Safe Council Member Organizations B-18

B.6 Silver Jackets Program B-18

B.7 Hazard Mitigation Public Awareness & Outreach B-18

Appendix C NHMPC Bylaws and Subcommittees

C.1 NHMPC Members C-1

C.2 Subcommittees of the NHMPC C-2

C.1 Bylaws of the NHMPC C-4

Appendix D Agendas and Meeting Minutes Planning Subcommittee

Appendix E Nevada Administrative Code: Emergency Management

Appendix F HAZUS Earthquake Maps

Appendix G List of Dams by County

Appendix H HAZUS Flood Maps for NV Counties

Appendix I Federal & State Assurances

Appendix J Wildfire & State-Owned Facilities Maps

Appendix K Extreme Weather Data from State Climatologist

Appendix L Noxious Weed Maps

Appendix M HAZUS Estimated Losses from Earthquake Vulnerability by County & Statewide

Appendix N Mitigation Strategy

Appendix O Memberships of Councils and Volunteers

Appendix P Completed Mitigation Activities

Appendix Q Miscellaneous Documents

Appendix R Nevada Ditches

Appendix S Standard Nevada Plan Review Crosswalk

Appendix T Enhanced Nevada Plan Review Crosswalk

List of Tables

Table 0-1 Nevada Earnings by Major Industry, 2011 0-3
Table 0-2 Major Nevada Reservoirs 0-5
Table 0-3 Nevada County and City Population Estimates 2012 0-9
Table 0-4 Tribal Demographics in Nevada 0-14
Table 0-5 Nevada Facts 0-15
Table 1-1 Summary of NRS Statutes Pertaining to Hazard Mitigation 1-3
Table 2-1 Membership of the NV Hazard Mitigation Planning Subcommittee. 2-2
Table 2-2 Documentation of Agency Participation in Update Process 2-5
Table 2-3 Documentation of NHM Planning Team Meetings 2-8
Table 2-4 NHMPC Subcommittee Meetings 2-14
Table 2-5 NHMP Revised Sections 2-15
Table 2-6 Integration of the NHMP with Other State Planning Efforts 2-20
Table 2-7 Integration of NHMP and Local Mitigation Plans with FEMA 2-24

Table of Contents 2013

Table 3-1	Identification and Screening of Hazards Affecting Nevada	3-3
Table 3-2	Hazard Prioritization Criteria	3-5
Table 3-3	Hazard Prioritization Worksheet Results	3-6
Table 3-4	Risk Categories Assigned to Nevada Hazards	3-8
Table 3-5	History of Nevada and Sierra Nevada Avalanche Occurrences	3-10
Table 3-6	Modified Mercalli Scale	3-21
Table 3-7	Significant Historical Earthquakes in Nevada from the 1840s	3-23
Table 3-8	Nevada Earthquakes in the Last Decade	3-23
Table 3-9	Some Major Active Faults in Nevada	3-28
Table 3-10	20th Century U.S. Pandemics and Epidemic Occurrences	3-34
Table 3-11	Recent Historical Occurrences or Outbreaks in NV	3-35
Table 3-12	Heat Extreme Events by Community	3-41
Table 3-13	Chronology of Major Flooding in Northern Nevada	3-45
Table 3-14	Summary of Major Flooding in Southern Nevada	3-55
Table 3-15	Levee Names and Lengths by County in Nevada	3-66
Table 3-16	Summary of Total NFIP Insurance Coverage & Claims in NV	3-67
Table 3-17	Summary of Repetitive Loss Due to Flood	3-68
Table 3-18	Chronology of Dam Failure in Nevada	3-74
Table 3-19	Nevada Canal and Ditch Flood History	3-80
Table 3-20	Significant Nevada Hail and Thunderstorm Events	3-83
Table 3-21	County Thunderstorm Historical Data	3-83
Table 3-22	Nevada Highway HAZMAT Incidents 2010-2012	3-90
Table 3-23	Nevada Spill Calls by Year 2000-2012	3-91
Table 3-24	Nevada Spill Calls by County 2000-2012	3-91
Table 3-25	Historical HAZMAT Events in NV	3-94
Table 3-26	Noxious Weeds that Threaten Nevada	3-103
Table 3-27	Severe Winter Storms in Nevada	3-116
Table 3-28	Severe Winter Storms in Nevada in Decreasing Order	3-117
Table 3-29	Nevada Tornado History	3-126
Table 3-30	Recent Wildfire History	3-137
Table 3-31	Wildfire Hazard Rating for Nevada Communities by County	3-148
Table 3-32	Chronology of Some Severe Destructive Windstorms	3-154
Table 3-33	Rankings of Hazards by County	3-163
Table 3-34	Rankings of Hazards by Tribes	3-164
Table 3-35	Threat Rankings by County	3-169

Table 3-36	Population Change in Nevada by County	3-170
Table 3-37	State Critical Facilities and Infrastructure	3-172
Table 3-38	Flood Vulnerability of State-Owned Buildings	3-175
Table 3-39	Wildfire (WUI) Vulnerability of State-Owned Buildings	3-176
Table 3-40	Vulnerability for State-Owned Communication Facilities	3-176
Table 3-41	Probabilities of Earthquakes Occurring within 50 years	3-179
Table 3-42	HAZUS Summary Estimates for Total Economic Losses	3-182
Table 3-43	HAZUS Top Ten NV Communities for Highest Loss	3-183
Table 3-44	HAZUS Loss-Estimation for 100-year Floods in Nevada	3-185
Table 3-45	Vulnerability to HAZUS 100-year Floods in Nevada	3-186
Table 3-46	Wildfire Vulnerability in Moderate to High-Risk Areas	3-188
Table 3-47	Wildfire Assessment of NV Counties and Tribal Lands	3-190
Table 4-1	2013 Goals and Lead Agencies	4-3
Table 4-2	Mitigation Goals and Strategic Actions	4-4
Table 4-3	Pre- and Post-Disaster Hazard Mgmt Policies, Programs	4-15
Table 4-4	HMA Grant Applications	4-33
Table 4-5	Mitigation Funding 2001-2010	4-34
Table 4-6	PDM & HMGP Funding by Hazard Type	4-36
Table 4-7	Existing State Model Codes Adopted by Local Governments	4-39
Table 4-8	Local and Tribal Capabilities' General Analysis	4-41
Table 4-9	STAPLEE Criteria for Ranking Mitigation Strategic Action Items	4-45
Table 4-10	Strategic Action Plan Matrix	4-47
Table 4-11	Current Funding Sources for Strategic Mitigation Actions	4-67
Table 4-12	Potential Funding Sources for Strategic Mitigation Actions	4-68
Table 5-1	Current Status of Local Hazard Mitigation Plans	5-5
Table 5-2	Current Status of Tribal Hazard Mitigation Plans in Nevada	5-5
Table 5-3	HMA Funding for Plans 2007-2010	5-10
Table 8-1	Mitigation Funding Under Presidential Disaster Declarations	8-11
Table 8-2	START Training Sessions in 2010-2012	8-19
Table 8-3	2005 to 2012 FEMA-Supported Grant Activities in Nevada	8-24
Table 8-4	Existing State Model Codes Promoted for Adoption	8-31
Table 8-5	Code Adoption by Jurisdiction, as of February 2013	8-33
Table B-1	Participating Organizations	B-20

Table of Contents 2013

List of Figures

Cover Page	Map of Quaternary Fault Movement in Nevada	
Figure 0-1	Shaded Relief Map of Nevada	0-4
Figure 0-2	County Map of Nevada	0-7
Figure 0-3	Nevada's Population Density	0-8
Figure 0-4	Nevada Land Use and Jurisdictions	0-11
Figure 0-5	Nevada Indian Reservation Map with Contact List	0-12
Figure 2-1	Public Participation Advertisement	2-12
Figure 3-1	Map of Sierra Avalanche Center's Forecast Area	3-13
Figure 3-2	National Weather Service Weekly Drought Monitor Map for NV	3-15
Figure 3-3	NWS Weekly Drought Monitor by Region for Western U.S.	3-16
Figure 3-4	Quaternary Fault Map of Nevada	3-19
Figure 3-5	Fault Scarp in the Fairview Peak Area	3-19
Figure 3-6	Significant Earthquakes in NV and Adjacent CA 1840s to 2012	3-22
Figure 3-7	NSL Shake Map for 22.7 Miles South of Wellington NV	3-26
Figure 3-8	Vertical Slip Rates of Normal-Slip Faults in Nevada	3-29
Figure 3-9	Map of Quaternary Fault Movement in NV	3-31
Figure 3-10	WHO Emerging and Re-emerging Infectious Diseases	3-34
Figure 3-11	Soil Map of Nevada	3-38
Figure 3-12	August 22, 2012 Flooding, Las Vegas Residential Area	3-54
Figure 3-13	August 22, 2012, Flooding UNLV Parking Lot	3-62
Figure 3-14	Major Rivers and Canals in Nevada	3-64
Figure 3-15	Areas Mapped as Special Flood Hazard Areas in Nevada	3-72
Figure 3-16	Location of Some of Nevada's Larger Dams	3-73
Figure 3-17	Schroeder Dam in Beaver Dam State Park, 2005	3-76
Figure 3-18	Flooded Intersection in Residential Area of SW Reno	3-79
Figure 3-19	Thunderstorms across the Sierra Nevada	3-82
Figure 3-20	Map of Nevada Showing Major Transportation Routes	3-88
Figure 3-21	Some Known Occurrences of Erionite in the Western U.S.	3-99
Figure 3-22	Regional Distribution of Mormon Crickets	3-106
Figure 3-23	Dot Map Showing Occurrences of New Zealand Mudsnails	3-108
Figure 3-24	Nevada Aquifer Map	3-111
Figure 3-25	Distribution of Subsidence Problems in US	3-112
Figure 3-26	Photo of the Aftermath of Slide Mountain Landslide	3-114
Figure 3-27	January 2005 Storm System	3-116

Figure 3-28	Oldest Tornado Photograph	3-125
Figure 3-29	June 9, 2006 Tornado in Diamond Valley	3-127
Figure 3-30	USGS Bathymetric View of Western Lake Tahoe	3-128
Figure 3-31	Lake Tahoe Fault Map	3-129
Figure 3-32	Mount St. Helens 1980 Eruption	3-131
Figure 3-33	Wildland Urban Interface Fire outside of Pioche, Nevada	3-134
Figure 3-34	Locations of 2012 Nevada Wildfires	3-141
Figure 3-35	Number of Wildfires in Nevada per Year 1999-2011	3-142
Figure 3-36	Acreage Burned in Nevada 1999-2011	3-142
Figure 3-37	Map Showing Communities with Extreme Wildfire Risk	3-147
Figure 3-38	Windstorm Damage in Gabbs, Nevada, 1998	3-153
Figure 3-39	Caughlin Fire in West Reno on November 18th, 2011	3-161
Figure 3-40	Locations of the 38 Nevada Earthquake HAZUS Communities	3-178
Figure 3-41	Shaking Potential Map for Nevada	3-181
Figure 4-1	PDM, FMA, & HMGP Grant Dollars of Funding per Year	4-35
Figure 4-2	PDM and HMGP Grant Dollars of Funding by Activity Type	4-36
Figure 4-3	Bar Graph of HMA Funding by County	4-37
Figure 5-1	Map of Counties and LHMP Status	5-2
Figure 5-2	NHMPC Application Prioritization Form	5-14
Figure 6-1	Annual Review Questionnaire	6-5
Figure 6-2	Sample Quarterly Financial & Progress Report	6-9
Figure 6-3	Activity/Project Implementation Report	6-11
Figure 8-1	Review, Ranking, and Selection Process	8-7
Figure 8-2	NHMPC Application Prioritization Form	8-8
Figure 8-3	Mitigation Activities Review Process	8-12
Figure 8-4	Sample Award Tracking Report	8-14

This Section provides an overview of the plan contents, a state profile, and a summary of land management in the State of Nevada. *Demographic and economic data have been updated for the 2013 iteration of the Plan.*

0.1 OVERVIEW OF PLAN CONTENTS

This is the third revision of the original Standard State Hazard Mitigation Plan (SHMP) that was written and approved by FEMA in 2004 and last revised in 2010. It presents an assessment of the risks and potential losses posed by these hazards throughout the State. It also provides the methodology for prioritization of these risks. The Nevada Hazard Mitigation Planning Committee (NHMPC) that wrote and revised the plan was composed of representatives from federal, state, tribal, and local entities and the private sector.

This plan is a living document and has been in a state of constant revision since the 2007 Plan according to the maintenance process presented in Section 6. The Planning Subcommittee met quarterly throughout 2011 and 2012 until the completion of the major elements of the revised Enhanced Nevada SHMP in December of 2012. The current revision of the SHMP is organized according to the elements presented in the FEMA Standard State Hazard Mitigation Plan Review Crosswalk (the Crosswalk). The plan meets the requirements of the Code of Federal Regulation (44 CFR 201) which precede each section.

This plan provides the basis and guidance for hazard mitigation in the State of Nevada. The goal of the plan is to reduce loss of life and property by fostering disaster-resilient communities.

Section 1 describes the State's process for adoption of the Plan and presents the state's authority to implement the plan**.**

Section 2 provides an overview of the planning process; identifies the Nevada Mitigation Planning Committee (NHMPC) members, and documents the participation of interested groups in the planning process. It also documents how the planning team reviewed and analyzed each section of the plan and indicates whether or not each section was revised.

Section 3 provides the identification of hazards that were considered and profiles each hazard affecting Nevada.

Section 4 provides the State's blueprint for reducing the losses identified in the risk assessment. It describes the State mitigation goals that guide the selection of mitigation activities. It also describes how the previous goals were assessed and whether or not they were revised. It includes a discussion of the State's pre- and post-disaster hazard management policies, programs, and capabilities. It includes an evaluation of State laws, regulations, policies, and programs related to hazard

mitigation. It evaluates the State's policies related to development in hazard-prone areas and discusses State funding capabilities for hazard mitigation projects. This section includes a general description and analysis of the effectiveness of local mitigation policies, programs, and capabilities.

Section 5 describes how the State supports local jurisdictions and tribal entities in developing plans that will accomplish their mitigation goals, objectives, and actions, through funding and technical assistance.

Section 6 describes the State of Nevada's plan for monitoring, evaluating, and updating the SHMP. It describes implementation measures, and reviews progress on mitigation goals, activities, and project closures.

Section 7 provides a list of sources used as references to gather data.

Section 8 provides the response to the enhanced plan requirements.

0.2 STATE PROFILE

This subsection provides a profile of the State of Nevada including economy, physiography, state facts, demographics, tribal information, geography, population, climate, political divisions and jurisdictions.

0.2.1 Economy

The major industry in Nevada is tourism. Tourism includes the large resorts and casinos found in large numbers in southern Nevada around Las Vegas and, to a lesser extent, in Reno and Lake Tahoe and the smaller communities. Please see Table 0-1 below showing earnings by major industry in Nevada for 2011. The information source is the U.S. Department of Commerce, Bureau of Economic Analysis and the Nevada Regional Economic Analysis Project. This data was retrieved December 6, 2011. The table below provides a snapshot of overall employment of the population of the state. Figure 0-1 is a shaded relief map of the state showing location of county boundaries, river systems, major rail, and highway networks.

Table 0-1. Nevada Earnings by Major Industry, 2011		
Major Industry	**2011 Earnings $(1000s)**	**Percent of Total**
Accommodation and Food Service	11,942,827	16.59%
Local Government	6,897,734	9.58%
Health Care and Social Assistance	6,456,931	8.97%
Professional and Technical Services	5,165,573	7.18%
Retail Trade	5,144,255	7.15%
Construction	4,608,417	6.40%
Finance and insurance	3,671,904	5.10%
Transportation and Warehousing	3,183,251	4.42%
Administrative and Waste Services	3,042,154	4.23%
Manufacturing	2,698,326	3.75%
Wholesale Trade	2,594,771	3.60%
Other Services, except Public Administration	2,384,270	3.31%
Management of Companies and Enterprises	2,317,632	3.22%
State Government	2,159,804	3.00%
Federal Civilian	1,763,248	2.45%
Federal Military	1,520,047	2.11%
Mining	1,519,075	2.11%
Real Estate, Rental and Leasing	1,351,304	1.88%
Arts, Entertainment and Recreation	1,317,640	1.83%
Information	998,365	1.39%
Utilities	562,245	0.78%
Educational Services	452,992	0.63%
Farm Earning	194,639	0.27%
Forestry, Fishing and Related Activities	41,460	0%
Total	71,988,864	100.00%

Source: Nevada Regional Economic Analysis Project 2011 http://nevada.reaproject.org/analysis/industry-analysis/by_industry/earnings/

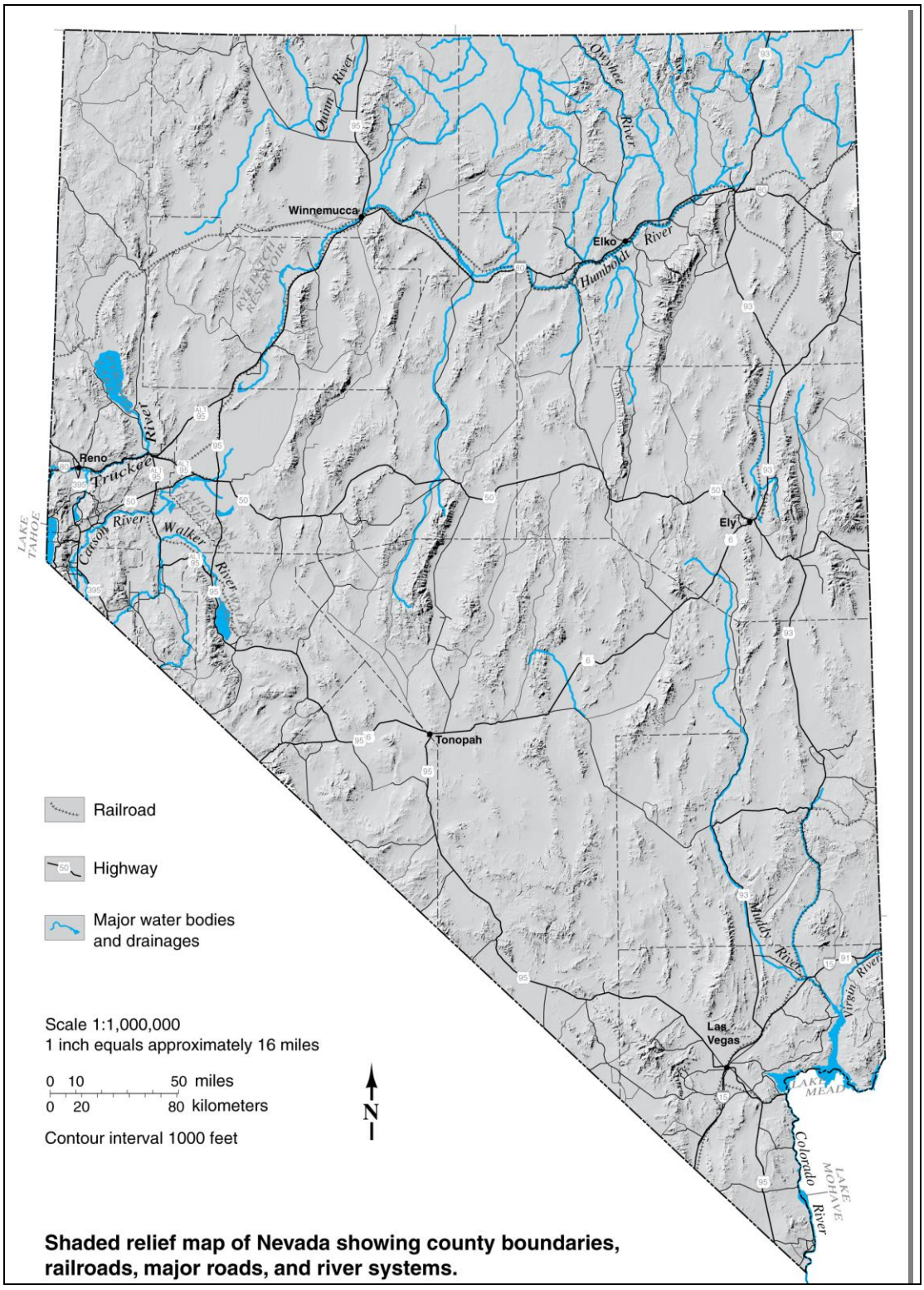

Figure 0-1. Shaded Relief Map of Nevada

0.2.2 Physical Geography

Nevada is bordered by California on the west, Oregon and Idaho on the north, Utah on the east, and Arizona on the southeast. Nevada is located primarily in the Basin and Range physiographic province with more than 30 north–south-trending mountain ranges and intervening valleys. Average elevation in the northern part of Nevada ranges from about 4,000 to 6,000 feet and averages from 2,000 to 3,000 feet in the southern part of the state. The highest elevations are Boundary Peak in the Sierra Nevada, at 13,143 feet, and Wheeler Peak, at 13,063 feet in the eastern part of the state. The southern part of the state lies within the Mojave Desert. The far northernmost part of the state lies within the Columbia River Plateau Physiographic region.

Most of Nevada lies within the Great Basin whose waters do not reach the ocean but terminate in sinks or flow into lakes with no outlets. There are some small drainage areas in the north margins of the state that empty into the Columbia River Basin and another limited region in the southeast that drains into the Colorado River.

The state's three main river systems that originate in the Sierra Nevada and flow generally eastward into Nevada are the Truckee, the Carson and the Walker Rivers. The termini of these rivers are respectively Pyramid Lake, Carson Sink, and Walker Lake. The Humboldt River system in northern Nevada is the only major river system that is entirely contained within the state, ending in Humboldt Sink. In the southern part of the state, the Virgin and Muddy Rivers flow south into the Colorado River system; this includes Lake Mead.

In addition to these natural waterways there are several major man-made reservoirs in the state, briefly described in Table 0-2 below.

Table 0-2. Major Nevada Reservoirs

Name	River System	Total Storage Capacity (acres)	Total Capacity Units (acre-feet)
Lake Mead	Colorado	29.7M	26.134M
Lake Mohave	Colorado	1.82M	1.818M
Lake Lahontan Reservoir	Carson	317,000	312,000
Pitt-Taylor Reservoir Upper	Humboldt	24,200	24,200
Pitt-Taylor Reservoir Lower	Humboldt	22,200	22,200
Rye Patch Reservoir	Humboldt	171,000	213,000
South Fork Reservoir	Elko	41,000	40,000
Wild Horse Reservoir	Owyhee	73,500	95,235

0.2.3 Climate

Nevada is the driest state in the U.S., with overall average annual precipitation of approximately nine inches. The low precipitation and high average elevation characterize most of the state as high desert.

0.2.4 Temperature

Nevada is characterized by exceptionally large daily ranges of temperature caused by strong surface heating during the day and rapid nighttime cooling. The mean annual temperatures vary from the middle 40s (Fahrenheit) in the northeast to the 50s in the west and central areas, and to the middle 60s in the south. The average range between the highest and the lowest daily temperatures is 30 to 35 degrees with larger variations in summer than the winter. Temperature extremes range from 120° F to 50° F below zero. Summer temperatures above 100° F are common in the south and occasional over the rest of the state. Over the northern and central portions of the State, freezes begin early in the autumn and continue until late in the spring.

0.2.5 Precipitation

Nevada's geographic location on the lee side of the massive mountain barrier of the Sierra Nevada markedly influences the precipitation that falls on the state. Prevailing west winds bring warm moist Pacific air that ascends cools, condenses and falls as precipitation before it reaches the eastern slope of the Sierra Nevada. The effects of this mountain barrier are felt throughout the State, resulting in desert conditions over the rest of the state. Nevada averages only about nine inches of precipitation overall. Highest amounts are in the Sierra Nevada averaging over 40 inches. The Ruby Mountains area in central Nevada averages about 18 inches, and the least amount of precipitation, as little as five inches, falls in the lower valleys of Nevada from Death Valley, California to the Idaho border. In the western and south-central mountains of the state, most of the precipitation falls as winter snow, while in the central and northeastern area most precipitation occurs as spring rain. In the southeastern part of the state, most of the precipitation comes from summer thunderstorms.

Although Nevada is characterized by generally low mean annual precipitation, occasional extreme precipitation events do present a risk to Nevada's people, homes, and infrastructure.

0.2.6 Population

Nevada has 17 counties with its population concentrated in centers separated by large sparsely populated spaces, as shown in Figures 0-2 and 0-3. More than 88% of the state's inhabitants reside in the two most populous counties, Clark and Washoe. 2011 population statistics by county are presented in Table 0-3. The sparsity of population and vast distances between population centers seriously impact preparation, response, and recovery efforts in an emergency event.

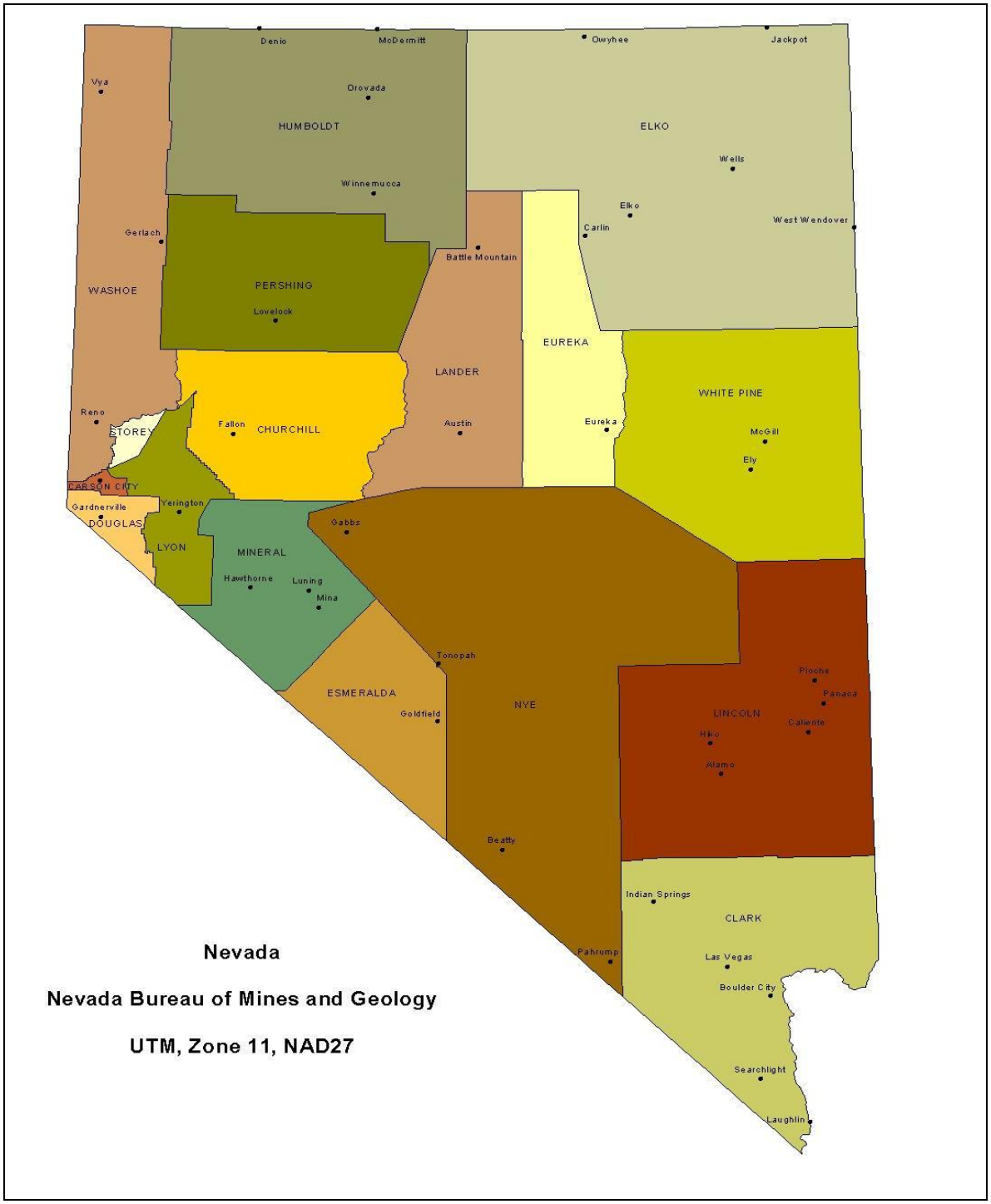

Figure 0-2. County Map of Nevada

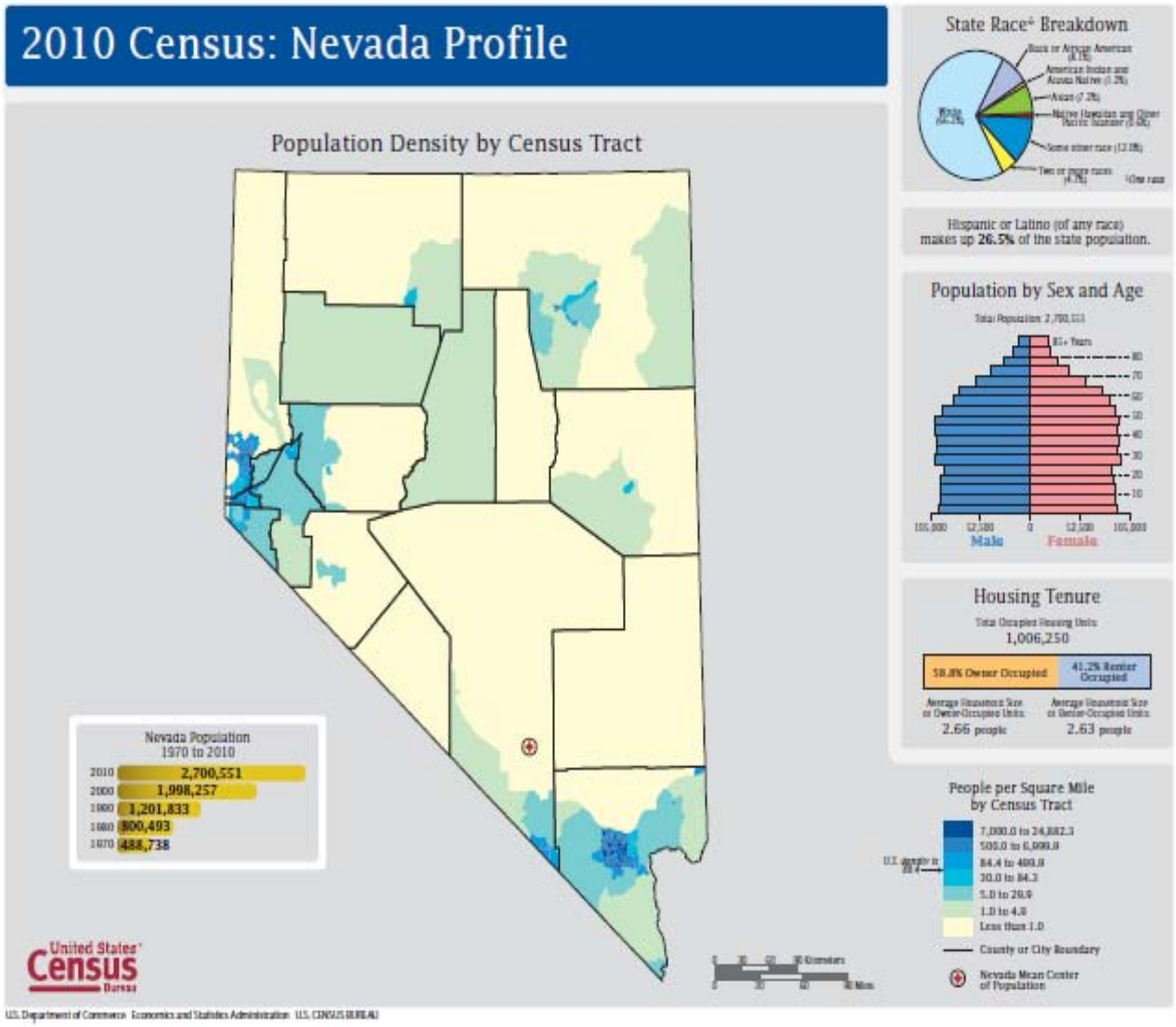

Figure 0-3. Nevada's Population Density

Table 0-3. Nevada County and City Population Estimates 2012

County	Population	County	Population
Carson City	**55,441**	**Lander County**	**6,221**
		No cities	
Churchill County	**25,238**	*Unincorporated towns*	
Cities		Austin	173
Fallon	8,706	Battle Mountain	3,421
		Kingston	124
Clark County	**1,988,195**		
Cities		**Lincoln County**	**5,100**
Boulder City	15,759	*Cities*	
Henderson	266,846	Caliente	1,089
Las Vegas	589,156	*Unincorporated towns*	
Mesquite	16,778	Alamo	563
North Las Vegas	222,009	Panaca	832
Unincorporated towns		Pioche	810
Bunkerville	1,084		
Enterprise	162,872	**Lyon County**	**52,245**
Indian Springs	1,192	*Cities*	
Laughlin	8,414	Fernley	18,831
Moapa	1,086	Yerington	3,094
Moapa Valley	6,868		
Mt. Charleston	647	**Mineral County**	**4,679**
Paradise	184,745	*No cities*	
Searchlight	395	*Unincorporated towns*	
Spring Valley	184,910	Hawthorne	3,086
Summerlin	25,260	Luning	99
Sunrise Manor	196,570	Mina	162
Whitney	38,910	Walker Lake	349
Winchester	31,634		
		Nye County	**44,292**
Douglas County	**48,015**	*Cities*	
No cities		*Unincorporated towns*	
Unincorporated towns		Amargosa	1,353
Gardnerville	5,495	Beatty	1,011
Genoa	219	Gabbs	271
Minden	3,010	Manhattan	125
		Pahrump	36,593
Elko County	**51,771**	Round Mountain	809
Cities		Tonopah	2,552
Carlin	2,376		
Elko	20,406	**Pershing County**	**7,013**
Wells	1,280	*Cities*	
West Wendover	4,367	Lovelock	1,936
Unincorporated towns		Unincorporated towns	
Jackpot	914	Imlay	186
Montello	60		
Mountain City	110	**Storey County**	**4,103**
		No cities	
Esmeralda County	**860**	*Unincorporated towns*	
No cities		Gold Hill	204
Unincorporated towns		Virginia City	830
Goldfield	259		

Table 0-3. Nevada County and City Population Estimates 2012			
County	**Population**	**County**	**Population**
Silver Peak	128	**Washoe County**	**427,704**
		Cities	
Eureka County	**2,011**	Reno	229,859
No cities		Sparks	90,214
Unincorporated towns			
Crescent Valley	370	**White Pine County**	**9,945**
Eureka (town)	717	*Cities*	
		Ely	4,066
Humboldt County	**17,384**	*Cities*	
Cities		Lund	207
Winnemucca	7,997	McGill	1,175
No towns		Ruth	418
STATE	**2,750,217**		
Source: Nevada State Demographer's office http://nvde.org/data-and-publications/estimates/estimates-by-county-city-and-unincorporated-towns/			

0.3 LAND MANAGEMENT AND JURISDICTION

An effective hazard mitigation plan must involve cooperation among all land management participants. Figure 0-4 is a map showing the overall distribution of federal and tribal lands in Nevada. Federal agencies control more than 86% of the land. These groups include the U. S. Bureau of Land Management (BLM); U.S. Department of Defense (DOD), U.S. Forest Service (FS), U.S. Bureau of Indian Affairs (BIA), U.S. Bureau of Reclamation (BOR), U.S. Fish and Wildlife Service (FWS), National Parks Service (NPS), and others. Some of the areas controlled by these agencies are shown in Figure 0-4 below.

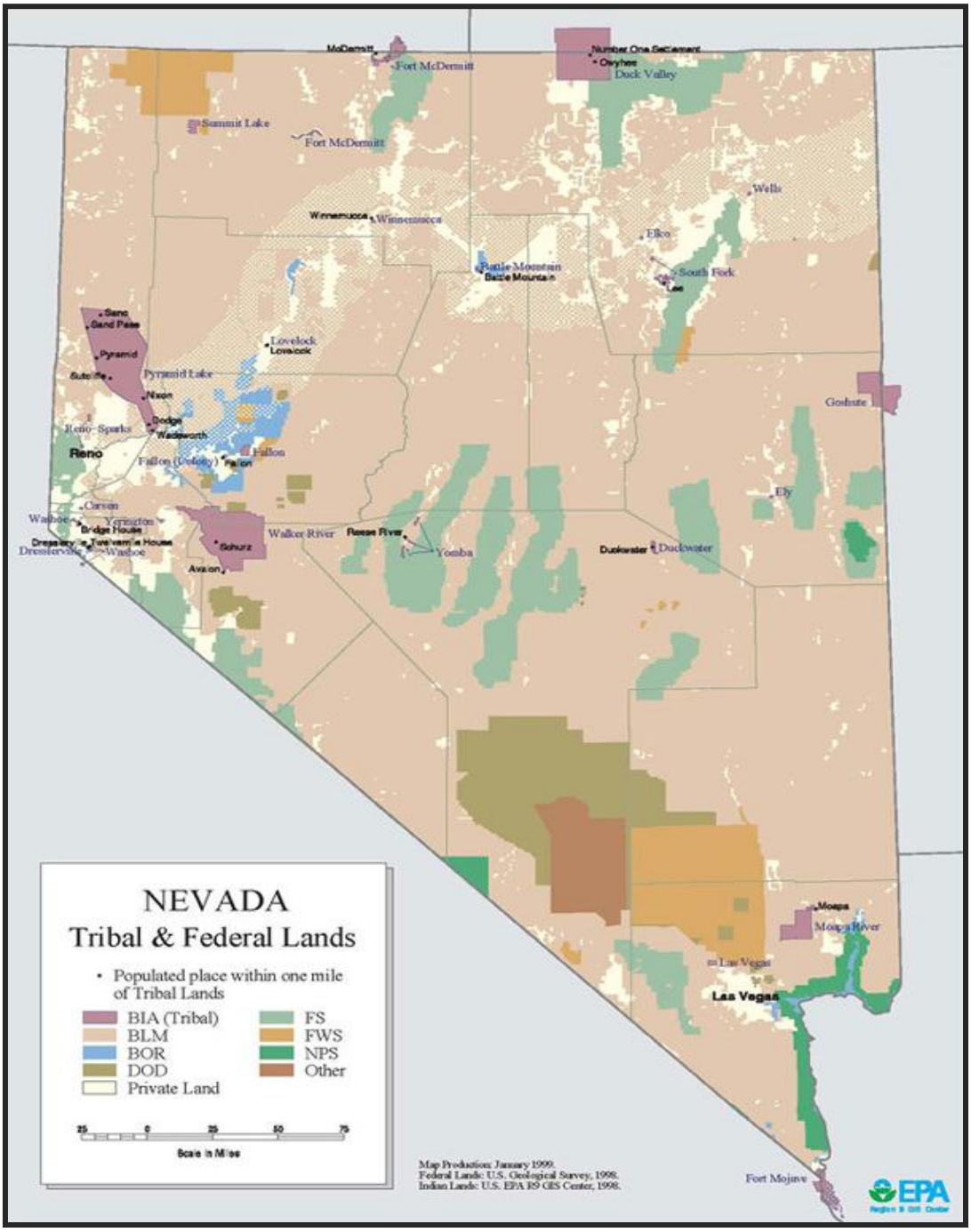

Figure 0-4. Nevada Land Use and Jurisdictions.

Figure 0-5 below shows the location of Indian reservations and colonies in Nevada and contact information for each tribal entity.

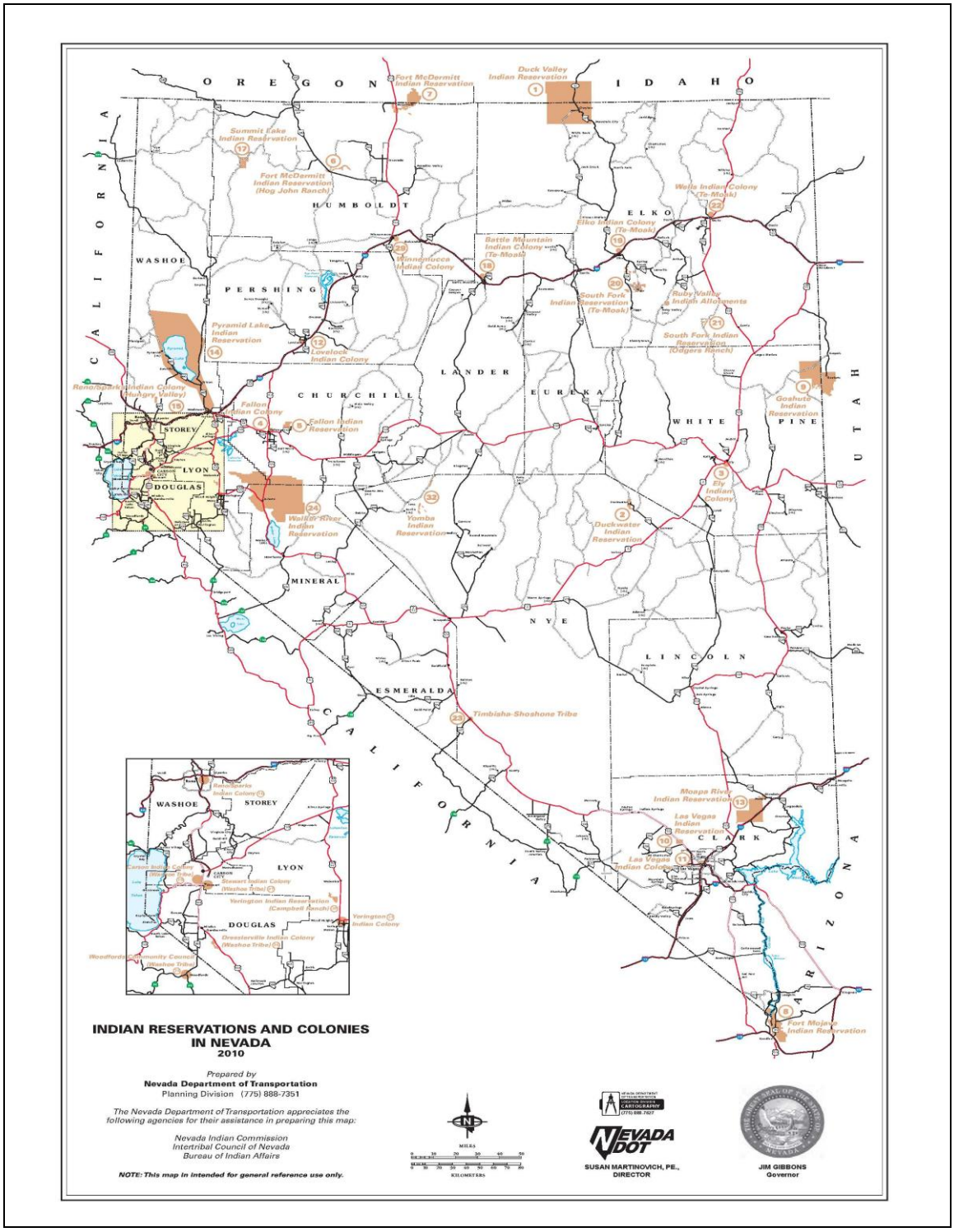

Figure 0-5. Nevada Indian Reservation Map with Contact List

INDIAN RESERVATIONS AND COLONIES IN NEVADA

Duck Valley Sho-Pai Tribe (1)
P.O. Box 219
Owyhee, Nevada 89832
Phone: (208) 759-3100
Fax: (208) 759-3940
www.shopaitribes.org

Duckwater Sho-Pai Tribes (2)
P.O. Box 140068
Duckwater, Nevada 89314
Phone: (775) 863-0227
Fax: (775) 863-0301

Ely Shoshone Tribe (3)
16 Shoshone Circle
Ely, Nevada 89301
Phone: (775) 289-3013
Fax: (775) 289-3156

Fallon Paiute-Shoshone Tribe (4,5)
565 Rio Vista Drive
Fallon, Nevada 89406
Phone: (775) 423-6075
Fax: (775) 423-5202
www.fpst.org

Fort McDermitt Paiute Shoshone Tribes (6,7)
P.O. Box 457
McDermitt, Nevada 89421
Phone: (775) 532-8259
Fax: (775) 532-8487

Fort Mojave Indian Tribe (8)
500 Merriman Street
Needles, California 92363
Phone: (760) 629-4591
Fax: (760) 629-5767
www.fortmojave.com

Goshute Business Council (9)
P.O. Box 6104
Ibapah, Utah 84034
Phone: (435) 234-1138
Fax: (435) 234-1162
www.goshutetribe.com

Las Vegas Paiute Tribe (10,11)
1 Paiute Drive
Las Vegas, Nevada 89030
Phone: (702) 386-3926
Fax: (702) 383-4019
www.lvpaiutetribe.com

Lovelock Paiute Tribe (12)
P.O. Box 878
Lovelock, Nevada 89419
Phone: (775) 273-7861
Fax: (775) 273-5151

Moapa Band of Paiutes (13)
P.O. Box 340
Moapa, Nevada 89025
Phone: (702) 865-2787
Fax: (702) 865-2875
www.moapapaiutes.com

Pyramid Lake Paiute Tribe (14)
P.O. Box 256
Nixon, Nevada 89424
Phone: (775) 574-1000
Fax: (775) 574-1008
www.plpt.nsn.us

Reno-Sparks Indian Colony (15,16)
98 Colony Road
Reno, Nevada 89502
Phone: (775) 329-2936
Fax: (775) 329-8710
www.rsic.org

Summit Lake Paiute Tribe (17)
1708 H Street
Sparks, Nevada 89431
Phone: (775) 827-9670
Fax: (775) 827.9678
www.summitlaketribe.org

Te-Moak Tribe of Western Shoshone
525 Sunset Street
Elko, Nevada 89801
Phone: (775) 738-9251
Fax: (775) 738-2345
www.temoaktribe.com

Battle Mountain Band Council (18)
37 Mountain View Drive #C
Battle Mountain, Nevada 89820
Phone: (775) 635-2004
Fax: (775) 635-8016

Elko Band Council (19)
511 Sunset Street
Elko, Nevada 89803
Phone: (775) 738-8889
Fax: (775) 753-5439

South Fork Band Council (20,21)
H.C. 30 Box B-13
Spring Creek, Nevada 89815
Phone: (775) 744-4273
Fax: (775) 744-4523

Wells Band Council (22)
P.O. Box 809
Wells, Nevada 89835
Phone: (775) 752-3045
Fax: (775) 752-2179

Timbisha Shoshone Tribe (23)
P.O. Box 206
Death Valley, California 92328
Phone: (760) 786-2374
Fax: (760) 786-2376
www.timbisha.org

Walker River Paiute Tribe (24)
P.O. Box 220
Schurz, Nevada 89427
Phone: (775) 773-2306
Fax: (775) 773-2585
www.wrpt.us

Washoe Tribe of Nevada & California
919 Highway 395 South
Gardnerville, Nevada 89410
Phone: (775) 265-4191
Fax: (775) 265-6240
www.washoetribe.us

Carson Colony Community Council (25)
2900 South Curry Street
Carson City, Nevada 89703
Phone: (775) 883-6459
Fax: (775) 883-6467

Dresslerville Community Council (26)
919 Highway 395 South
Gardnerville, Nevada 89410
Phone: (775) 265-4191
Fax (775) 265-6240

Stewart Community Council (27)
919 Highway 395 South
Gardnerville, Nevada 89410
Phone: (775) 265-4191
Fax: (775) 265-6240

Woodfords Community Council (28)
96 Washoe Boulevard
Markleeville, California 96120
Phone: (530) 694-2170
Fax: (530) 694-1890

Winnemucca Colony Council (29)
P.O. Box 1370
Winnemucca, Nevada 89446
Phone: (775) 623-0888
Fax: (775) 623-6918

Yerington Paiute Tribe (30,31)
171 Campbell Lane
Yerington, Nevada 89447
Phone: (775) 463-3301
Fax: (775) 463-2416

Yomba Shoshone Tribe (32)
H.C. 61 Box 6275
Austin, Nevada 89310
Phone: (775) 964-2463
Fax: (775) 964-2443

RELATED ORGANIZATIONS

Bureau of Indian Affairs Western Regional Office
400 North 5th Street
Phoenix, Arizona 85004
Phone: (602) 379-6782

Nevada Indian Commission
5366 Snyder Avenue
Carson City, Nevada 89701
Phone: (775) 687-8333
Fax: (775) 687-8330
www.nic.nv.gov

Nevada Urban Indians, Inc.
1475 Terminal Way
Suite B
Reno, Nevada 89502
Phone: (775) 788-7600
Fax: (775) 788-7611
www.nevadaurbanindians.org

Inter-Tribal Council of Nevada
680 Greenbrae Drive, Suite 280
Sparks, Nevada 89431
Phone: (775) 355-0600
Fax: (775) 355-0648
www.itcn.org

Las Vegas Indian Center, Inc.
2300 West Bonanza Road
Las Vegas, Nevada 89107
Phone: (702) 647-5842
Fax: (702) 647-4497
www.lasvegasindiancenter.org

California / Nevada Tribal Technical Assistance Program (TTAP)
Nevada Indian Justice Center
5250 Aero Drive
Santa Rosa, California 95403
Phone: (707) 579-5507 or (707) 579-9019

Figure 0-5. (cont.) Nevada Indian Reservation Map with Contact List

Table 0-4. Tribal Demographics in Nevada				
Reservation Names and Map ID Numbers shown on Figure 0-4	**Date Established**	**Resident Tribe(s)**	**Population of the Reservation in NV (2010 census)**	**Enrolled Tribal Members**
Duck Valley Shoshone-Paiute (1)	1877	Western Shoshone, Paiute	953	2000+
Duckwater Shoshone (2)	June 14, 1942	Western Shoshone	156	373
Ely Shoshone Council (3)	1931	Western Shoshone	202	
Fallon Paiute-Shoshone (4, 5)	1887	Paiute, Western Shoshone	711	1297
Fort McDermitt Paiute-Shoshone (6, 7)	1892	Shoshone, Paiute	334	
Fort Mojave (8)			223	
Confederated Tribe of the Goshute Reservation (9)	1863; 1940 constitution	Goshute, Western Shoshone, Navajo, Ute, Paiute, Northern Cheyenne, Southern Arapahoe, Bannock	15	565 (as of 3/2009)
Las Vegas Paiute Colony (10, 11)	1911	Paiute	154	
Lovelock Paiute (12)			88	
Moapa Business Council (13)			260	
Pyramid Lake Paiute (14)	1936	Paiute	1660	
Reno-Sparks Indian Colony (15, 16)	Early 1900s; more formal Tribal Government in 1935	Paiute, Shoshone, and Washoe	919	900+
Summit Lake Paiute (17)			1	120
Te-Moak Tribal Council *(see individual bands below)*		Te-Moak Western Shoshone		
Battle Mountain Band Council (18)	1917	Te-Moak Western Shoshone	553 (1995)	
Elko Band Council (19)	1918	Te-Moak Western Shoshone	1326 (1995)	
South Fork Band Council (20, 21)	1941	Te-Moak Western Shoshone	122	
Wells Band Council (22)	1863	Te-Moak Tribes of Western Shoshone	70	177
Timbisha Shoshone (23)	1983	Timbisha Shoshone Tribe, Western Shoshone	199 (1992)	

Table 0-4. Tribal Demographics in Nevada				
Reservation Names and Map ID Numbers shown on Figure 0-4	**Date Established**	**Resident Tribe(s)**	**Population of the Reservation in NV (2010 census)**	**Enrolled Tribal Members**
Walker River Paiute (24)	1874	Paiute	746	
Washoe Tribe of Nevada and California *(see individual bands below)*			2916	
Carson Colony Community Council (25)	1934	Washoe	242	
Dresslerville Community Council (26)	1934	Washoe	314	
Stewart Community Council (27)	1934	Washoe	147	
Woodfords Community Council (28)	1934	Washoe		
Winnemucca Colony Council (29)			53	
Yerington Paiute (30, 31)			151	
Yomba Tribal Council (32)	Dec 22 1939	Western Shoshone	95	
Source: 2010 U.S. Census. This remains the most recent complete tribal data available in the state. Data is available online in a report entitled: The American Indian and Alaska Native Population:2010: http://www.census.gov/prod/cen2010/briefs/c2010br-10.pdf				

Table 0-5 presents pertinent historical, geographic, and demographic facts about the State of Nevada as well as State Trivia.

Table 0-5. Nevada Facts	
State Facts	
Admitted to United States	October 31, 1864
State name	Nevada, meaning snow-capped
Capital City	Carson City
Largest City	Las Vegas
Number of Counties	17
Number of Tribal Reservations	26
Percentage of federally controlled lands	86%
Physiography	
Total land area	109,781 sq. mi., rank: 7th largest
Latitude and Longitude	Longitude: 114°W to 120°W Latitude: 35°N to 42°N

Table 0-5. Nevada Facts	
Highest point	13,140 ft. at Boundary Peak in the Sierra Nevada
Lowest point	470 ft on the Colorado River in Clark County
Mean elevation	5,500 feet above sea level
Demographics	
Total population (2012 estimate)	2,758,931
Population per square mile (2012)	25.1
Population, percent change 2000 to 2011	37%
Homeownership rate, 2007-2011	59.1
Median household income, 2007-2011	$52,762
High school graduates, percent of persons age 25+, 2007-2012	84.2%
State Trivia	
State nickname	Silver State; Sagebrush State, Battle-Born State
State slogan	Battle Born
State motto	"All for our country"
State animal	Desert Bighorn Sheep *(Ovis canadensis nelsoni)*
State bird	Mountain bluebird *(Sialia currucoides)*
State fish	Lahontan cutthroat trout *(Salmo clarki henshawi)*
State flower	Sagebrush *(Artemisia tridentate)*
State fossil	Ichthyosaur *(Shonisaurus)*
State grass	Indian rice grass *(Oryzopsis hymenoides)*
State reptile	Desert tortoise *(Gopherus agassizii)*
State trees	The Single-leaf pinon *(Pinus monophylla)* and the Bristlecone Pine *(Pinus aristata)*
State rock	Sandstone
State precious gemstone	Virgin Valley black fire opal
State colors	Silver and blue
State metal	Silver
Source: http://quickfacts.census.gov/qfd/states/32000lk.html US Census Bureau 2012	

This Section provides an overview of the Disaster Mitigation Act of 2000 (DMA 2000; Public Law 106-390), the adoption of the *Nevada Standard Hazard Mitigation Plan* (Nevada HMP) by the State of Nevada, and assurances to amend the Nevada HMP to reflect changes in federal laws and regulations. *There was a minor change in NRS 353 due to the Legislative session in 2013.*

1.1 DISASTER MITIGATION ACT OF 2000

The DMA 2000 was passed by Congress to emphasize the need for mitigation planning to reduce vulnerability to natural and human-caused hazards. The DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act; 42 United States Code [USC] 5121 et seq.) by repealing the act's previous Mitigation Planning Section (409) and replacing it with a new Mitigation Planning Section (322).

To implement the DMA 2000 planning requirements, the Federal Emergency Management Agency (FEMA) published an Interim Final Rule in the *Federal Register* on February 26, 2002 (FEMA 2002a). This rule (44 code of Federal Regulations [CFR] part 201) established the mitigation planning requirements for states, tribes, and local communities. The planning requirements are described in detail in Section 2 and identified in their appropriate sections throughout the plan.

1.2 PLAN ADOPTION PROCEDURES

The requirements for the adoption of the Nevada HMP by the State of Nevada, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: PREREQUISITES

Adoption by the State

Requirement §201.4(c)(6): The plan **must** be formally adopted by the State prior to submittal to *[FEMA]* for final review and approval.

Requirement §201.4(c)(7): The plan **must** include assurances that the State will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c). The State will amend its plan whenever necessary to reflect changes in State or Federal laws and statues as required in 44 CFR 13.11(d).

Element

Has the State formally adopted the plan?

Does the plan provide assurances that the State will **continue to** comply with all applicable Federal statutes and regulations during the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c), and will amend its plan whenever necessary to reflect changes in the State or Federal laws and statutes as required in 44 CFR 13.11(d)?

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

Upon completion, the Nevada Hazard Mitigation Planning Committee (NHMPC) will forward the plan to FEMA for final approval through the Division of Emergency Management. The Governor of the State of Nevada will adopt the plan upon

approval by FEMA. The Nevada Division of Emergency Management (NDEM) will immediately forward the adoption documentation to FEMA. The Governor's adoption resolution for the 2010 plan is in Appendix A. A similar document will be prepared and completed to adopt the 2013 plan.

The Nevada HMP meets the requirements of Section 409 of the Stafford Act and Section 322 of the DMA 2000. This includes meeting the requirement that the Nevada HMP is adopted by the State. The State plan was prepared by the Nevada Hazard Mitigation Planning Committee with participation from various State and Local agencies, and other organizations listed in Appendix B.

1.2.1 State Authority

The Governor of the State of Nevada has broad powers over emergency management within the State of Nevada under Chapter 414 of the Nevada Revised Statutes (NRS). Under these powers he has the obligation to ensure that an emergency management plan is prepared for the entire State, to ensure its proper implementation and to ensure compliance with all State and Federal laws pertaining to emergency management, which would include mitigation issues. The Nevada Division of Emergency Management is the lead agency for compliance and implementation.

1.2.2 Nevada Revised Statutes (NRS)

The Nevada Revised Statutes (NRS) are the current codified laws of the State of Nevada and are a compilation of all legislation passed by the Nevada Legislature. In NRS 220.110, the Nevada Revised Statutes shall contain the following items:

- The Constitution of the United States.
- The Constitution of the State of Nevada.
- The laws of this state of general application.
- A full and accurate index of the statute laws.
- Such annotations, historical notes, Supreme Court and district court rules, and other information as the Legislative Counsel deems appropriate to include.

[Part 2:304:1951; A 1953, 388]—(NRS A 1963, 1022; 1969, 12)

Table 1-1 below provides a summary of information on specific statutes that promote hazard mitigation on the state level. These statutes can be found at the following link http://www.leg.state.nv.us/NRS/Index.cfm.

Table 1-1. Summary of NRS Statutes Pertaining to Hazard Mitigation	
NRS Statute	**Summary**
NRS Chapter 205	This chapter is titled "Crimes Against Property," which includes arson.
NRS Chapter 206	Chapter 206 is titled "Malicious Mischief," and includes crimes to public and private property.
NRS Chapter 239C & NRS Section 239C.010	Chapter 239C is Nevada's Homeland Security legislation which provides plans to respond to terrorism and related emergencies. Also, it promotes statewide preparations for acts of cyber-terrorism, environmental catastrophes, and other related incidents.
NRS Chapter 268 & NRS Section 268.012	This Chapter and section give the cities of the State authority to adopt uniform building, plumbing and electrical codes.
NRS Chapter 278 & NRS Section 278.02521	This Chapter, provides direction in land use planning for the protection of environmentally sensitive areas and development where there are sufficient resources and water to accommodate such development and to promote the efficient use of land in urban areas along with conversion of rural lands to other uses as appropriate.
NRS Section 278.580(16)(a)	This Section mandates that a governing body shall amend its building codes to include seismic provision of the International Building Code and the standards for the investigation of hazards relating to seismic activity including, without limitation, potential surface ruptures and liquefaction.
NRS Section 321.5977	This Chapter provides objectives in administering Public lands under NRS Chapter 321 – State Public Lands.
NRS Sections 321.640 – 321.770	NRS Sections 321.650 through 321.770 contain State land use planning – laws to govern growth and use of lands which could impact emergencies.
NRS Chapter 322	This Chapter provides direction in the Use of State Lands – those lands that belong to the State and the governing of them.
NRS Chapter 323	This Chapter is the State of Nevada's adoption of the "Taylor Grazing Act" which facilitates that law within our State.
NRS Chapter 324	This Chapter is the State of Nevada's adoption of the principles in the "Carey Act" – which regulates the use of water, particular the capturing of water in dams, for irrigation and the reclamation aspects of such water projects as governed by the Bureau of Land Management.
NRS Chapter 341 & NRS Section 341.087	Chapter 341 pertains to the construction of state facilities. The Legislature has also mandated the state Public Works Board to adopt the seismic provisions of the International Building Code and the standards for the investigation of hazards relating to seismic activity, including, without limitation, potential surface ruptures and liquefaction.

Table 1-1. Summary of NRS Statutes Pertaining to Hazard Mitigation	
NRS Statute	**Summary**
NRS Section 353.2735	Chapter 353 creates and administers the Disaster Relief Account. The account is used to stabilize the operation of the State Government, including local jurisdictions, from an emergency/disaster.
NRS Sections 410.095 - 410.210	NRS Sections 410.095 through 410.210 contain the regulation and restriction of landfills, garbage dumps and junkyards.
NRS Section 414.040	Under this Chapter, the Chief of the Division of Emergency Management has the authority and power to develop an integrated process for the mitigation of, response to and recovery from emergencies or disasters through the various governmental agencies, business and industry, volunteer organizations and any other interested parties.
NRS Section 414.060(3)b	The Governor may prepare a comprehensive state emergency management plan and develop a program for emergency management in this state to be integrated into and coordinated with the plans of the Federal Government and of other states for emergency management to the fullest possible extent, and coordinate the preparation of plans and programs for emergency management by the political subdivisions of this state to be integrated into and coordinated with the plan and program of this state to the fullest possible extent.
NRS Section 414.135	The Section describes the Emergency Assistance Account. This account is to provide supplemental emergency assistance to the State of Nevada or to its local governments impacted by an emergency and/or disaster.
NRS Chapter 415	This Chapter contains the Emergency Management Assistance Compact. "The purpose of this Compact is to provide for mutual assistance between the States entering into this Compact in managing any emergency or disaster that is duly declared by the Governor of the affected State(s), whether arising from natural disaster, technological hazard, man-made disaster, civil emergency aspects of resources shortages, community disorders, insurgency, or enemy attack." It also provides for mutual cooperation in emergency exercises, testing, and training.

Table 1-1. Summary of NRS Statutes Pertaining to Hazard Mitigation	
NRS Statute	**Summary**
NRS Chapter 416	This Chapter is about Emergencies Concerning Water or Energy. In NRS Section 416.010, "the purpose of this chapter is to meet effectively water and energy emergencies by providing for conservation, efficient utilization, production and allocation of water and energy in ways which will: 1. Carry out as necessary, national water and energy policies under federal water and energy laws; 2. Maintain vital services necessary for the peace, health, safety and welfare of the people of this state; 3. Promote the most efficient use of water and energy; 4. Lessen adverse impacts upon employment in and the economy and environment of this state; 5. Ensure to the extent reasonably possible equitable treatment of all regions of the State and all sectors of the economy, consistent with other necessary considerations; and 6. Promote and protect the interests of this state in the course of decisions to be made and actions to be taken under federal water and energy laws.(Added to NRS by 1977, 548)"
NRS Chapter 441A	This Section deals with Communicable Diseases (a disease which is caused by a specific infectious agent or its toxic products, and which can be transmitted, either directly or indirectly, from a reservoir of infectious agents to a susceptible host organism), Emergency Quarantine of humans, and Enforcement of quarantines.
NRS Chapter 444A	This Chapter contains programs for recycling and the regulation of disposal of solid waste and other waste.
NRS Chapter 445A	This Chapter contains Water Controls – laws to protect the Lake Tahoe Watershed, to prevent water pollution and to regulate the fluoridation of water supplies.
NRS Chapter 445B	This Chapter deals with Air Pollution – laws for control of and administration of all aspects of prevention of air pollution – the creation of the State Environmental Commission.
NRS Chapter 445C	This Chapter contains environmental requirements, penalties for violations and the administration and enforcement of such requirements.
NRS Chapter 445D	This Chapter contains environmental covenants that attach to real property – governed by the Nevada Department of Natural Resources and Conservation
NRS Chapter 455	This Chapter contains the control and restriction of excavations and high voltage lines.
NRS Section 459	This Chapter contains the Western Interstate Nuclear Compact, of which Nevada is a member State. It provides for the development of nuclear related fields for economic development of the Western States with provisions for the cooperation of party states in the response to and mitigation of a nuclear incident in any of the member states and to recommend changes to laws, regulations, ordinances, administrative procedures and practices to facilitate safe and secure usage of nuclear technologies.

Table 1-1. Summary of NRS Statutes Pertaining to Hazard Mitigation	
NRS Statute	**Summary**
NRS Sections 459.010-370	The Nevada Legislature in NRS 459.001 adopted the Rocky Mountain Low-Level Radioactive Waste Compact making Nevada a participating state in this compact. It provides for the safe management of low-level radioactive waste material generated within the party states through appropriate laws within the compact.
NRS Sections 459.0085- 0098	NRS Sections 459.0085 through 459.0098 contain the creation, duties, and powers of the Committee on High-Level Radioactive Waste. These sections empower the Committee to study and evaluate: 1. Information and polices regarding the location in the State of Nevada of a facility for the disposal of high-level radioactive waste; 2. Any potentially adverse effects from the construction and operation of a facility and the ways of mitigating those effects; and 3. Any other policies relating to the disposal of high-level radioactive waste.
NRS Sections 459.380-930	The remainder of Chapter 459 of the NRS (Sections 459.380 through 459.930) provides for the regulation of, storage of and transportation of hazardous materials within the State. These laws proved for the response to, the mitigation of and recovery from hazardous material releases.
NRS Section 461.170	The Nevada Legislature has adopted by statute, for the purposes of manufactured buildings, the Uniform Housing Code, the Uniform Building Code, the Uniform Plumbing Code, Dangerous Building, the Uniform Building Code Standards and the American National Standards Institute Standard No. A117.1.
NRS Chapter 472	This Chapter gives the State Forester Fire Warden authority over the development of, mitigation of and prevention of fires within the state's forested areas by establishing fire control districts, adopting and enforcing regulations regarding standards for fire retardant roofing and administering monies appropriated and grants awarded for fire prevention, control and the education of fire personnel for these purposes. Establishment and preservation of forest and vegetation cover in forest and watershed.
NRS Chapter 475	This Chapter entitled "Crimes and Responsibilities Concerning Fires" details penalties for neglecting or causing fires on one's own property or the property of another.
NRS Chapter 476	This Chapter entitled "Explosives and Inflammable Materials" details the penalties for misuse of these materials.

Table 1-1. Summary of NRS Statutes Pertaining to Hazard Mitigation	
NRS Statute	**Summary**
NRS Chapter 477	This Chapter of the NRS governs the State Fire Marshal's Office and its duties and powers. These laws provide for the proper regulation of and enforcement of existing laws which govern the prevention of, mitigation of and recovery from fires within this State. Particularly, the State Fire Marshal makes recommendations for changes to building codes and existing structures to ensure fire safety.
NRS Chapter 486A	This Chapter provides provisions for alternative fuels and clean-burning fuels.
NRS Chapter 506	This Chapter is the Wildlife Violator Compact – a compact among the states to aid wildlife management as a trust by the state for all residents and visitors.
NRS Section 514.040(3)	The Nevada Bureau of Mines and Geology, established by the Legislature and given as one of its duties: ". . . to apply geologic engineering principles to problems of conservation, environment, construction, mineral industry and other scientific matters that may be of importance to the welfare of the State."
NRS Chapter 519A	This chapter governs the reclamation of land subject to mining operations and exploration projects.
NRS Sections 522.039-522.040	Sections 522.039 and 522.049 regulate oil and gas drilling to prevent waste.
NRS Chapter 527	This Chapter titled "Protection and Preservation of Timbered Lands, Trees and Flora" describes the protection and preservation measures for Nevada's trees and flora. Also, it describes measures taken for controlled burns.
NRS Chapter 528	This Chapter regulates forest practice and reforestation.
NRS Chapter 534	This Chapter regulates underground water and depletion of aquifers.
NRS Section 535.030	This section covers dam inspections and the State Engineer's powers to protect life and property by lowering the water level in the reservoir, emptying the reservoir, or any other step to essential to safeguarding life and property.
NRS Chapters 540 - 540A	Chapters 540 and 540A provide planning and development of water resources and the regional planning and management of water resources.
NRS Chapter 541	This Chapter creates Water Conservancy Districts for wise water management.
NRS Chapter 543 & NRS Section 543.020	This Chapter is dedicated to flood control. The declaration of the policy being adopted states: "It is hereby declared to be the policy of the State of Nevada to cooperate with the United States and its departments and agencies, and with the counties, cities and public districts of the State, in preventing loss of life and property, disruption of commerce, interruption of transportation and communication and waste of water resulting from floods, and in furthering the conservation, development, utilization and disposal of water."
NRS Chapter 548	This Chapter regulates agricultural lands to preserve and conserve the natural resources of this State.

Table 1-1. Summary of NRS Statutes Pertaining to Hazard Mitigation	
NRS Statute	**Summary**
NRS Chapter 555	This Chapter provides the Director of the Department of Agriculture with the powers to control insects, pests and noxious weeds.
NRS Chapter 568	This Chapter regulates the grazing and ranging of lands within the State of Nevada.
NRS Chapter 571	This Chapter defines the State Quarantine Officer and provides the Officer power to proclaim and enforce quarantine. This Chapter also adopts the rules and regulations of the federal Secretary of Agriculture relating to control and suppression of disease in animals.
NRS Chapter 701	This Chapter provides for the Office of Energy (under the Governor), which regulates energy resources and energy conservation and encourages renewable energy.
NRS Chapters 703 – 704	Chapters 703 and 704 provide for the regulation of public utilities by the Public Utilities Commission.
NRS Section 708.120	This Section authorizes the Public Utilities Commission to regulate oil pipelines to prevent waste and dangerous operations.

1.2.3 Legislative Process

The Nevada Legislature meets every odd number year for approximately six months. During this period NHMPC may support hazard mitigation-related legislation presented by state agencies, private non-profits, businesses and or local jurisdictions. NHMPC can also present new or modifications to existing hazard mitigation-related legislation. Any revisions or additions will be recorded in this Section of the NHMP during its revision period. During the 2013 Legislative session, Senate Bill 44 clarified language for the Disaster Relief Account currently found in Chapter 352 of the Nevada Revised Statutes.

1.2.4 Assurances to Comply with Federal Laws and Regulations

Through the development and enforcement of this plan, the assurances listed in Appendix I are provided as documentation that the state or any subsequent sub-grantee will continue to comply with all applicable Federal statutes and regulations during the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c), and will amend its plan whenever necessary to reflect changes in State or Federal laws and statutes as required in 44 CFR 13.11(d).

This Section provides an overview of the planning process; identifies the Nevada Mitigation Planning Committee (NHMPC) members; documents public outreach efforts; and summarizes the review and incorporation of existing plans, studies, and reports used in the development of this Nevada Hazard Mitigation Plan (NHMP). *The overall planning revision process was the same as in the previous update but the membership of the NHMPC was broadened to include more stakeholders in the planning process. One other revision to this section made since the 2010 update is that a new effort was made to track some public education and outreach efforts in hazard mitigation made by NHMP committee and subcommittee members by circulating and collecting a form documenting these efforts and tabulating them. Also the plan documents Nevada's participation in the U.S. Army Corps of Engineers' Silver Jackets program beginning in 2012.*

2.1 OVERVIEW OF THE PLANNING PROCESS

The requirements for the documentation of the mitigation planning process, as stipulated by the DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: PLANNING PROCESS

Documentation of the Planning Process
Requirement §201.4(c)(1): The State plan **must** include a description of the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how other agencies participated.

Element
- Does the plan provide a narrative description of how the **new or updated** plan was prepared?
- Does the **new or updated** plan indicate who was involved in the **current** planning process?
- Does the **new or updated** plan indicate how other agencies participated in the planning process?
- Does the updated plan document indicate how the planning team reviewed and analyzed each section of the plan?
- Does the updated plan indicate for each section whether or not it was revised as part of the update process?

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

2.1.1 How the Updated Plan was Prepared

The Subcommittee followed the method for updating the plan presented in Section 6.1.4 of Section Six of the 2010 NHMP. What follows is a narrative summary of how this was accomplished:

In January of 2011, the Subcommittee met and tasked the planning team with implementation of the decisions of the Subcommittee on modifications to the plan document. The Subcommittee continually provided direction and expertise to the planning team throughout the update process. The planning team solicited input from the Subcommittee members and other agencies with the expertise needed to address the required Crosswalk elements revisions for each Section. The planning team reviewed and analyzed each section of the plan with input from the Subcommittee members. The planning team revised each section accordingly and brought revisions to the Subcommittee for final review. The Subcommittee Chair presented the Subcommittee's updated sections to the NHMPC for final approval. Table 2-4 in Section 2.1.4 lists each planning team work session, who was present, and accomplishments.

Proposed updates to sections were posted for review on the NHMPC website and emailed to the Subcommittee members as well as to additional interested stakeholders, with a deadline for submitting comments. All comments received were discussed at the next Subcommittee meeting with a consensus reached on proposed revisions to the section. The Subcommittee directed the planning team to modify the Section as agreed and when revised sections were completed, these were again posted and emailed for final review. The Subcommittee Chair reviewed any additional input and if the change was significant an email was sent requesting a vote. The final draft was placed as an action item for approval on the agenda for the next meeting.

2.1.2 Who Was Involved in the NHMP Update Process

In order to prepare the 2013 update to NHMP, the Subcommittee reevaluated FEMA's Crosswalk comments and the Annual Review Questionnaire to identify any stakeholders whose participation would be invaluable to the planning process or to mitigation actions. Based on this review, the Planning Team drafted a letter of invitation and a list of potential stakeholders to whom the invitation was sent some responded and some did not. The resultant Mitigation Planning Subcommittee participating members and their proxies are listed in Table 2-1. Subcommittee participation and contributions are documented by the attendance rosters and minutes of each meeting. The Subcommittee was expanded in this iteration with representation from several new entities. These include:

Table 2-1. Membership of the Nevada Hazard Mitigation Planning Subcommittee and alternates (as of Sepember 2013)

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Nevada Revised Statutes on Open Meetings were followed in publicly posting scheduled meetings of the NHMP subcommittee. Participation from the public in the planning process was also solicited via postings in the online quarterly meeting agendas, on the NHMPC and DEM websites, and on social media mitigation sites (Facebook, Twitter) maintained by DEM requesting input and feedback on mitigation issues and activities. To date there has been no direct public feedback received in response to these postings, however, we still feel it is important to keep them updated and current as a resource for the public to access freely.

Information about the plan update and the planning process was presented by NESC and WUI group at meetings that took place during the plan update period. This reached a much larger audience that included hospitals, service providers, casinos, private industry, private non-profits, GIS specialists, building officials, federal agencies such as Bureau of Land Management, U.S. Forest Service, architectural and engineering firms, homeowners, and local firefighters. DEM staff ensured that the meeting agendas were distributed to local

emergency managers and tribal entities requesting input. No direct comments or feedback from the public were received by the Subcommittee about the state plan update from any of these entities.

All members of the NHMPC and Subcommittee participate in a wide variety of other state and public organizations such as the Nevada Earthquake Safety Council, the Wildland Urban Interface Summit, the State Mapping Advisory Committee, Nevada Mining Association, the State Emergency Response Commission, Homeland Security Working Group, Nevada Hospital Association, State Public Works Division, Intertribal Council of Nevada, Nevada Insurance Council, and many other educational and civic groups. Through contact with groups such as these, the subcommittee members have much contact with the public and hear their concerns about hazard mitigation in many venues and thus are able to incorporate these concerns into their work on the Subcommittee.

2.1.3 How Other Agencies Participated in the NHMP Update Process

Other agencies participated by serving as members of the NHMP Subcommittee and by providing oversight and direction of the update process. When additional information was required to comply with Crosswalk elements and recommendations, the Subcommittee also solicited specific input, expertise, and data from other agencies not represented on the Subcommittee. Table 2-2 details the contributions of all agencies in the NHMP update process.

Table 2-2. Documentation of Agency Participation in Update Process

Agency	Mode of Participation in the Plan Update Process
Carson City Fire Department	Provides input on Wildland Urban Interface (WUI) fire risks and mitigation strategies to reduce WUI fire risk
Carson City Office of Emergency Management	Provides input on mitigation of Wildland-Urban Interface fires, flooding, earthquake, hazardous materials, etc.
City of Las Vegas Office of Emergency Management	Represents the interests of Clark County's Hazard Mitigation Committee on the State Mitigation Planning Subcommittee.
FEMA Region IX	Provides FEMA guidance to the Subcommittee in revising the NHMP.
National Weather Service/Reno	Provides data on weather-related hazards to aid in the revision and update of the NHMP at quarterly meetings and via email..
Nevada Attorney General's Office	Provides legal counsel to the Subcommittee and language revisions used in the updated plan. Ensures compliance with Nevada Revised Statutes in all updated material in the NHMP.
Nevada Bureau of Mines and Geology	Provides geologic information, editorial and technical assistance, GIS data, and support personnel to the Subcommittee to aid in the revision and update of the NHMP.
Nevada Department of Administration/ Division of Risk	Provides insurance, safety, loss prevention and risk management data used to update the NHMP.

Table 2-2. Documentation of Agency Participation in Update Process	
Agency	**Mode of Participation in the Plan Update Process**
Management	
Nevada Department of Agriculture	Provides information regarding agriculture and related industries to the Subcommittee for use in updating the NHMP
Nevada Department of Cultural Affairs, State Historical Preservation Office	Provides technical assistance to the Subcommittee regarding preservation of Nevada's historic and cultural resources. Provides Unreinforced Masonry Building (URM) data regarding historical buildings to the Subcommittee to aid in the revision and update of the NHMP.
Nevada Department of Transportation	Provides leadership and direction to the Subcommittee in updating the NHMP; identified state transportation-related infrastructure vulnerable to hazards; and updated hazard data tables at quarterly meetings and via email.
Nevada Dept. of Conservation & Natural Resources	Provides data and information to the NHMP committee for use in updating the NHMP specifically pertinent to infestation, epidemic, flood, Hazmat, wildfire, and other sections.
Nevada Dept. of Wildlife	Provides expert input and data on invasive species.
Nevada Division of Emergency Management	Provides personnel, resources, research, and data used to update the NHMP. Provides a link between FEMA Region IX and the Subcommittee. Provides disaster response and recovery information to the Subcommittee.
Nevada Division of Environmental Protection	Provides the Subcommittee with input relating to air quality, water quality, and hazardous materials used in updating the NHMP.
Nevada Division of Forestry	Provides input on Wildland Urban Interface (WUI) fire risks, and mitigation strategies to reduce WUI fire risk at quarterly meetings and via email.
Nevada Division of Insurance	Provides direction to the Subcommittee to promote hazard mitigation in the private sector to enhance its benefits to reducing risk at quarterly meetings and via email..
Nevada Division of Public Works	Provides information regarding facilities infrastructure to the Subcommittee to aid in the revision and update of the NHMP.
Nevada Division of Water Resources	Provides floodplain management data and Repetitive Loss data to the Subcommittee for use in updating the NHMP. Provided dam inspection data pertinent to dam safety, risks and mitigation.
Nevada Earthquake Safety Council (NESC)	Provides input on earthquake safety and hazards used in updating the NHMP.
Nevada Public Agency Insurance Pool	Provides data on Unreinforced Masonry Buildings (URM) data to the Subcommittee to aid in the revision and update of the NHMP at quarterly meetings.
Nevada State Emergency Response Commission	Provides expertise on hazardous materials profile and permitting in plan updates.
Nevada State Fire Marshal's office	Provides information regarding fire and Hazmat hazard in the state to the Subcommittee for plan updates.

Table 2-2. Documentation of Agency Participation in Update Process	
Agency	**Mode of Participation in the Plan Update Process**
Nevada State Hospital Association	Provides critical facilities information to the Subcommittee used to update the NHMP and supports the implementation of mitigation activities in hospitals statewide.
U. S. Army Corps of Engineers	Provides input on mitigation of flood hazards through frequent meetings and teleconferences with committee members.
U. S. Bureau of Land Management	Provides input on mitigation of Wildland-Urban Interface fires through quarterly meetings.
U. S. Dept. of Agriculture	Provides data and information to the Subcommittee for use in updating the NHMP specifically pertinent to infestation, epidemic, Hazmat, wildfire, and other sections through interactions with committee members at a variety of meetings.
U. S. Forest Service	Provides input on mitigation of Wildland-Urban Interface fires through interaction with Subcommittee members at quarterly meetings.
U. S. Geological Survey	Provides input on mitigation of flood and earthquake hazards through interactions with committee members at a variety of meetings.
University of Nevada Dept. of Geological Sciences	Provides geological and historical input on avalanche, tsunami, earthquake, and landslide hazards.
University of Nevada Seismological Laboratory	Provides technological, geological, and historical input on earthquake hazards through interactions with committee members at a variety of meetings.
Washoe Tribe of Nevada & California	Provides information regarding tribal nations to the Subcommittee for use in updating the NHMP

2.1.4 How the Subcommittee Achieved the Update of Each Section of the NHMP

The Subcommittee charged the planning team with specific tasks in reviewing and analyzing each section of the plan. The planning team revised each section accordingly and presented revisions to the Subcommittee for final review. The Subcommittee Chair presented the Subcommittee's updated sections to the NHMPC for final approval. As part of the update process, local jurisdictional hazard mitigation plans were incorporated into the NHMP as they were approved by FEMA and made available. As hazard and vulnerability assessments became available, these data were incorporated into the NHMP. Table 2-3 documents specific accomplishments of the planning team at each work session and Table 2-4 documents the progress made at NHMPC Planning Subcommittee quarterly meetings.

Table 2-3. Documentation of NHM Planning Team Meetings		
Date	**Update Planning Team Participants**	**What was accomplished**
7 April 2011	Jim Walker, Elizabeth Ashby, D.D. LaPointe	Discussed inviting other stakeholders. Brainstormed business outreach in mitigation activity and better coordination with other NHMP committee members.. Outlined attack plan for 2013 NHMP update. Drafted agenda for 4/25 NHMPC subcommittee meeting.
12 April 2011	Elizabeth Ashby, D.D. LaPointe	Prepared working drafts of Standard and enhanced NHMP 2013 update. Reviewed Crosswalk recommendations for Standard and enhanced NHMPs and addressed these with comments in appropriate Plan sections for planned revisions based on those recommendations.
25 April 2011	Jim Walker, Elizabeth Ashby, D.D. LaPointe	Pre-Subcommittee meeting-reviewed agenda for Subcommittee meeting to follow
17 May 2011	Karen Johnson, Elizabeth Ashby, D.D. LaPointe	Worked on revisions to Section Zero; population data, economic data, climate section and included climate change where applicable.
14 June 2011	Karen Johnson, Elizabeth Ashby, D.D. LaPointe	Worked on revisions and comments to Section Zero. Added Hazardous Materials to Section 3 and edited it. Drafted invitation letter to join NHMP Planning Subcommittee and developed new invitee list. Karen worked on Tribal population sources. Talked to Bill Elliott about adding Mitigation Action Items to Continuity of Operations Plans. Submitted NRS Table - Section 1 for review by AG.
14 July 2011	Karen Johnson, D.D. LaPointe	Worked on revisions to agenda for July 25 quarterly meeting. Reviewed invitations to join Subcommittee
18 August 2011	Karen Johnson, Elizabeth Ashby, D.D. LaPointe	Worked on minutes to July 25 quarterly meeting. Minor revision and consolidation of some Tables
1 September 2011	Elizabeth Ashby, D.D. LaPointe	Worked on a new suggested methodology for prioritization of hazards to present to the Subcommittee and a table similar to Arizona's to use in this prioritization.
6 September 2011	Elizabeth Ashby, D.D. LaPointe	Revised and improved new hazard prioritization criteria table and devised a worksheet based on new criteria to present to the Subcommittee at next meeting to use in prioritization of hazards.
13 September 2011	Elizabeth Ashby, D.D. LaPointe	Edited Section Three language to conform to new suggested hazard prioritization criteria and worksheet.
20 October 2011	Elizabeth Ashby, D.D. LaPointe, Karen Johnson	Worked on NHMP planning objectives and action items; all-hazard.
27 October 2011	Elizabeth Ashby, D.D. LaPointe, Karen Johnson	Worked on NHMP planning objectives and action items; all-hazard.
31 October 2011	Elizabeth Ashby, D.D. LaPointe, Jim Walker	Pre-quarterly meeting review of agenda items
22 December 2011	Elizabeth Ashby, D.D. LaPointe	Developed new table entitled "Rankings of Hazards by Counties and Tribal Entities"
29 December 2011	Elizabeth Ashby, D.D. LaPointe	Populated new table entitled "Rankings of Hazards by Counties and Tribal Entities"
12 January 2012	Elizabeth Ashby, D.D. LaPointe, Jim Walker	Reviewed & modified table entitled "Rankings of Hazards by Counties and Tribal Entities" using input from subcommittee chair. We discussed coming changes in the Plan review process. Also discussed future changes of "Vulnerability Assessment."

Table 2-3. Documentation of NHM Planning Team Meetings		
Date	**Update Planning Team Participants**	**What was accomplished**
19 January 2012	Elizabeth Ashby, D.D. LaPointe, Jim Walker	Discussed upcoming changes in how FEMA will do the plan review process – not by Crosswalk. Discussed separation of vulnerability assessment from Sec. 3 into its own section and other ways to cut down bulk in the plan. Discussed meeting agenda.12:00
30 January 2012	Elizabeth Ashby, D.D. LaPointe	Updated past planning team meetings and worked on additional prioritization worksheet submissions and agenda for special meeting.
9 February 2012	Elizabeth Ashby, D.D. LaPointe	Updated Subcommittee membership list and agenda for upcoming special meeting and finalized hazard prioritization worksheet.
13 February 2012	Elizabeth Ashby, D.D. LaPointe, Jim Walker	Pre-quarterly meeting review of agenda items.
6 March 2012	Elizabeth Ashby, D.D. LaPointe	Laid out post-meeting work plan.
17 April 2010	Elizabeth Ashby, D.D. LaPointe	Worked on agenda for April 30 Subcommittee meeting, Worked on updates to Subcommittee membership list. Worked on edits to Section 3 of NHMP.
24 April 2012	Elizabeth Ashby, D.D. LaPointe	Final updates to Subcommittee membership list. Worked on edits to hazard prioritization and rankings in Section 3 of NHMP.
30 April 2012	Elizabeth Ashby, D.D. LaPointe, Jim Walker	Pre-quarterly meeting review of agenda items, assignment of parts of Section 3 to subcommittee members to review
3 May 2012	Elizabeth Ashby, D.D. LaPointe	Worked on minutes to April quarterly meeting
15 May 2012	Elizabeth Ashby, D.D. LaPointe	Worked on new Section 3a- Vulnerability Assessment analysis; sent e-mails asking for updates to locations of critical facilities, schools, fire stations, higher education and medical facilities. Reviewed returns on Section 3 hazard Profile updates.
22 May 2012	Elizabeth Ashby, D.D. LaPointe	Sent e-mails asking for more reviews on sec 3 to Mike Dondero and Mike Wilde. Added Sec. 3 review edits on Epidemic. Reviewed what will be needed to update new Vulnerability Assessment Section; and sent e-mails asking Tribes to update wildfire vulnerability assessment.
24 May 2012	Elizabeth Ashby, D.D. LaPointe	Discussed new HAZUS data input on hospitals and URMs. Reviewed and accepted edits and rewrote parts of Sec. 3 profiles of Epidemic, Landslide, Land Subsidence, Tsunami/Seiche, Volcano, and Expansive Soils.
29 May 2012	Elizabeth Ashby, D.D. LaPointe	Sent last portions of Section 3 to experts in fields to review: Infestation to JoAnne Skelly/Jeff Knight./NDEP. Epidemic & Infestation to Dr. Assam; Drought to Rob Martinez; Flood to Rhett Milne, NDOT input on weather sections. Began revisions to Sec. 6- Plan Maintenance.
14 June 2012	Elizabeth Ashby, D.D. LaPointe	Assembled reviews received from experts in various hazard fields and made edits to portions of Section 3: Avalanche, severe wind, tornado, volcano, expansive soil, tsunami, landslide, land subsidence.
27 July 2012	Elizabeth Ashby, D.D. LaPointe	Reviewed agenda for planned Subcommittee meeting on Monday; Assembled more reviews and data received from experts in hazard fields and completed edits on Avalanche & Tornado portions of Section 3. Finalized edits on Tsunami section profile.
30 July 2012	Elizabeth Ashby, D.D. LaPointe, Rick Diebold	Reviewed agenda for Subcommittee meeting later Monday and prepared handouts. Reviewed Goals and Objectives section of Vulnerability Assessment part of Section 4 and planned to give to appropriate Subcommittee members for review and editing.

Table 2-3. Documentation of NHM Planning Team Meetings		
Date	**Update Planning Team Participants**	**What was accomplished**
2 August 2012	Elizabeth Ashby, D.D. LaPointe,	Transcribed minutes from July 30, 2012 quarterly meeting of NHMPC Planning Subcommittee.
10 August 2012	Elizabeth Ashby, D.D. LaPointe,	Revised sec. 3 hazard profile sections: Landslide, Expansive soil, land subsidence, volcano,
14 August 2012	Elizabeth Ashby, D.D. LaPointe,	Revised sec. 3 hazard profile sections: Hazmat; sent reviewer requests.
24 August 2012	D.D. LaPointe	Revised sec. 3 hazard profile section on Infestations: finalized section on severe winter storm; sent reviewer requests on Infestations.
28 August 2012	Elizabeth Ashby, D.D. LaPointe	Finalized sec. 3 hazard profile edits on Infestations: to send to reviewer Laura Richards.
4 September 2012	Elizabeth Ashby, D.D. LaPointe	Added more material on Infestation and severe winter storm profiles of Section 3.
6 September 2012	Elizabeth Ashby, D.D. LaPointe	Discussed quarterly meeting schedule; added edits on drought profile portion of section 3. Added NRS changes on Infestations and Drought.
11 September 2012	D.D. LaPointe, Elizabeth Ashby	Made final edits on drought profile portion of section 3. Added minor edits on earthquake and substantial edits on Severe Thunderstorm & Hail and Extreme Heat profile portions of section 3.
20 September 2012	D.D. LaPointe, Elizabeth Ashby	Made edits on earthquake profile portion of section 3.
25 September 2012	D.D. LaPointe	Made edits on thunderstorm & hail and windstorm history tables in profile portions of section 3.
27 September 2012	D.D. LaPointe, Elizabeth Ashby	Made edits on portions of section 3.
3 October 2012	D.D. LaPointe	Made edits on hazard profile portions of section 3.
9 October 2012	D.D. LaPointe, Elizabeth Ashby	Made edits on hazard profile portions of section 3.
11 October 2012	D.D. LaPointe, Elizabeth Ashby	Made edits on hazard profile portions of section 3.
16 October 2012	D.D. LaPointe, Elizabeth Ashby	Made edits on hazard profile portions of section 3.
23 October 2012	D.D. LaPointe	Worked on agenda for quarterly meeting; e-mailed Subcommittee members; finalized drafts of low-risk hazard profile sections of section 3.
25 October 2012	D.D. LaPointe, Gary Johnson	Worked on program for quarterly meeting; e-mailed reminder to Subcommittee members; made extra meeting handout copies for upcoming quarterly meeting.
29 October 2012	D.D. LaPointe, Jim Walker	Met before quarterly meeting to review agenda
6 November 2012	D.D. LaPointe, Elizabeth Ashby	Made final edits on low-risk hazard profile portions of section 3 from Peter Mulvihill.
8 November 2012	D.D. LaPointe, Elizabeth Ashby	Made edits on medium/significant and high-risk hazard profile portions of section 3.
8 November 2012	D.D. LaPointe, Elizabeth Ashby	Made edits on medium/significant and high-risk hazard profile portions of section 3. Downloaded edits.
14 November 2012	D.D. LaPointe, Elizabeth Ashby	Finalized edits on Drought and HazMat hazard profile portions of section 3.
15 November 2012	D.D. LaPointe	Made edits on Flood hazard profile portion of section 3.
21 November 2012	D.D. LaPointe, Elizabeth Ashby	Made edits on Flood hazard and other profile portions of section 3.
27 November 2012	D.D. LaPointe, Elizabeth Ashby	Made edits on Flood hazard and Wildfire profile portions of section 3.

Table 2-3. Documentation of NHM Planning Team Meetings		
Date	**Update Planning Team Participants**	**What was accomplished**
29 November 2012	D.D. LaPointe, Elizabeth Ashby	Made edits on Wildfire profile portion of section 3.
4 December 2012	D.D. LaPointe, Elizabeth Ashby	Made edits and additions to on Wildfire profile portion of section 3, , contacts with Gary Johnson on content
5 December 2012	D.D. LaPointe, Elizabeth Ashby	Made edits on Wildfire profile portion of section 3, updated Table, contacted Gary Johnson on more content.
6 December 2012	D.D. LaPointe, Elizabeth Ashby	Made edits on Wildfire profile portion of section 3, began edits to WMD profile Section.
11 December 2012	D.D. LaPointe, Elizabeth Ashby	Made edits on Wildfire profile portion of section 3, Flood profile Section.
13 December 2012	D.D. LaPointe, Elizabeth Ashby	Made edits on Wildfire profile portion of section 3, Flood profile Section.
28 Dec 2012	D.D. LaPointe, Elizabeth Ashby	Made edits on Wildfire, Hazmat,Terrorism profile portions of section 3.
8 January 2013	D.D. LaPointe, Elizabeth Ashby	Made edits on Flood, Wildfire, Hazmat profile portions of section 3, Sec, 0, Agenda.
10 January 2013	D.D. LaPointe, Elizabeth Ashby	Made edits on Hazmat, Terrorism profile portions of section 3.
14 January 2013	D.D. LaPointe, Elizabeth Ashby, Karen Johnson	Made edits on Sec 0, Sec 1, portions of Enhanced NHMP.
15 January 2013	D.D. LaPointe	Made final edits on WMD/Terrorism profile portion of section 3.
17 January 2013	D.D. LaPointe, Elizabeth Ashby	Reviewed final edits on on WMD/Terrorism profile portion of section 3.also EQ, wildfire, Hazmat, and agenda for Jan 28 meeting.
22 January 2013	D.D. LaPointe, Elizabeth Ashby	Reviewed final drafts of sec 3 subsections to be given to Subcommittee members at Jan 28 meeting
24 January 2013	D.D. LaPointe, Elizabeth Ashby	Reviewed final drafts of sec 3 subsections to be given to Subcommittee members at Jan 28 meeting
28 January 2013	D.D. LaPointe, Elizabeth Ashby	Reviewed final handouts prior to meeting of Subcommittee in afternoon of Jan 28
28 January 2013	Full Subcommittee meeting	Received input on members' Awareness and Outreach activities and completed mitigation activities. Reviewed and approved Sections Zero and One with minor edits. Reviewed and approved Wildfire, Earthquake, Severe Winter Storm, and Drought Section Three profiles with minor edits and Flood with future amendment of irrigation canal data. Got feedback on profiles of sections for Hazmat, and Terrorism/WMD.
29 January 2013	D.D. LaPointe, Elizabeth Ashby	Wrote minutes for Jan. 28 Subcommittee meeting and Completed edits on Sections Zero and One.
31 January 2013	D.D. LaPointe, Elizabeth Ashby, Rob Palmer (NDEPA)	Added minor edits to several profiles as suggested by attendees at Jan. quarterly Subcommittee meeting. Worked with Rob on edits to HazMat profile.
5 February 2013	D.D. LaPointe, Karen Johnson	Edited Section 2 of NHMP 2013; some edits in general Hazard profiling and Hazmat portions of section 3 of NHMP.
7 February 2013	D.D. LaPointe, Elizabeth Ashby	Edited Sections
12 February 2013	D.D. LaPointe, Elizabeth Ashby, Karen Johnson	Met and discussed several different sections and plans for edits while driving to and from Winnemucca for full NHMP committee meeting.
18 February 2013	D.D. LaPointe, Elizabeth Ashby	Completely rewrote Terrorism/WMD subsection of section 3 using input from Ryan Miller and Subcommittee members
26 February 2013	D.D. LaPointe, Elizabeth Ashby	Met, discussed, and wrote up minutes of full NHMP committee meeting in

Table 2-3. Documentation of NHM Planning Team Meetings		
Date	**Update Planning Team Participants**	**What was accomplished**
		Winnemucca on 2/12.
5 March 2013	D.D. LaPointe, Elizabeth Ashby	Revised new Terrorism/WMD subsection based on feedback from Ryan Miller and the NTAC group; edited NHMP sec. 8.
7 March 2013	D.D. LaPointe, Elizabeth Ashby	Made more edits to NHMP sec. 8, section 2, Appendix B
12 March 2013	D.D. LaPointe, Elizabeth Ashby	Made more edits to NHMP sec. 8, section 2, Appendix B
14 March 2013	D.D. LaPointe	Made minor edits to NHMP sec. 8; edited sec. 5; section 2
19 March 2013	D.D. LaPointe, Elizabeth Ashby, Karen Johnson	Edited Section 5
21 March 2013	D.D. LaPointe, Elizabeth Ashby	More edits on Section 5
2 April 2013	D.D. LaPointe, Elizabeth Ashby, Karen Johnson	Made more edits to NHMP sec. 8, section 5, and Section 4
9 April 2013	D.D. LaPointe, Elizabeth Ashby	Edited NHMP sec. 8, section 5, and overall organization of files.
23 April 2013	D.D. LaPointe, Elizabeth Ashby	Worked on final edits to NHMP sec. 8, section 5, HAZMAT, Terrorism and WMD parts of Sec 3, and Appendices in preparation for Subcommittee meeting on April 29.
25 April 2013	D.D. LaPointe, Elizabeth Ashby	Continued work on edits to NHMP sec 4, Goals and objectives in preparation for Subcommittee meeting on April 29.
29 April 2013	D.D. LaPointe, Elizabeth Ashby, James Walker	Reviewed all earlier work in preparation for Subcommittee meeting later in the day.
30 April 2013	D.D. LaPointe, Janell Woodward, Karen Johnson	Made edits to NHMP sec. 8 suggested by Subcommittee member Peter Mulvihill; briefly spoke with Janelle about future work.
9 May 2013	D.D. LaPointe, Elizabeth Ashby, Janell Woodward, Karen Johnson	Made edits to NHMP sec. 3 intro, sec 3 profiles, sec 4, sec. 8, sec. 5, cleaning up details, as suggested at full NHMP committee meeting May7 for approval of sections, and saved final sections.
14 May 2013	D.D. LaPointe, Janell Woodward	Made edits to NHMP sec. 4 as suggested by Elizabeth; helped Janelle with formatting of Secs 0, 1, 3.
16 May 2013	D.D. LaPointe, Elizabeth Ashby, Janell Woodward, Karen Johnson	Made edits to NHMP sec. 4
21 May 2013	D.D. LaPointe, Elizabeth Ashby	Made edits to NHMP sec. 4, Goals and Strategic actions, EQ; worked on NHMPC meeting minutes
23 May 2013	D.D. LaPointe, Elizabeth Ashby	Sent edits to NHMP sec. 4, Goals and Strategic actions, EQ, to NSL, NBMG for review; worked on NHMPC meeting minutes
28 May 2013	D.D. LaPointe, Elizabeth Ashby	Made edits to NHMP sec. 4, sec. 5.; and Appendix N
4 June 2013	D.D. LaPointe, Elizabeth Ashby	Made edits to NHMP sec. 4 and Appendix P
6 June 2013	D.D. LaPointe	Made edits to NHMP sec. 6
13 June 2013	D.D. LaPointe, Elizabeth Ashby	Made edits to NHMP sec. 6; memo on NBMG meeting.

Table 2-3. Documentation of NHM Planning Team Meetings		
Date	**Update Planning Team Participants**	**What was accomplished**
14 June 2013	D.D. LaPointe, Elizabeth Ashby	Finished edits to NHMP sec. 4; 6. Made edits to Vulnerability assessment portion of Section 3 and Appendix J.
18 June 2013	D.D. LaPointe, Elizabeth Ashby	Worked on to Vulnerability assessment portion and irrigation ditch portion of Section 3.
20 June 2013	D.D. LaPointe, Elizabeth Ashby, Gary Johnson	Worked on scoping out formatting to HAZUS sections of Vulnerability assessment portion of Section 3.
21 June 2013	D.D. LaPointe, Elizabeth Ashby	Made edits to irrigation ditch portion of Section 3. Vulnerability Assessment portion of Section 3 and several Appendices.
25 June 2013	D.D. LaPointe, Elizabeth Ashby	Made edits to Section 6, Section 4, and Vulnerability Assessment portion of Section 3.
27 June 2013	D.D. LaPointe, Elizabeth Ashby	Made edits to Section 6, Section 4, and Vulnerability Assessment portion of Section 3.
2 July 2013	D.D. LaPointe, Elizabeth Ashby	Made edits to Vulnerability Assessment portion of Section 3, Appendices,
3 July 2013	D.D. LaPointe, Elizabeth Ashby	Wrote agenda for July 29th Planning Subcommittee meeting; made edits to Vulnerability Assessment portion of Section 3,
5 July 2013	D.D. LaPointe, Elizabeth Ashby	Made edits to Section 3 and Appendices.
8 July 2013	D.D. LaPointe, Elizabeth Ashby, Janell Woodward, Karen Johnson	Made edits to Vulnerability Assessment portion of Section 3.
9 July 2013	D.D. LaPointe, Elizabeth Ashby, Janell Woodward, Karen Johnson	Made edits to Vulnerability Assessment portion of Section 3, Appendix J.
11 July 2013	D.D. LaPointe, Elizabeth Ashby, Janell Woodward, Karen Johnson	Made edits to Vulnerability Assessment portion of Section 3, Appendix M.
12 July 2013	D.D. LaPointe, Elizabeth Ashby	Made edits to Combined sec 3 profiles and appendices
19 July 2013	D.D. LaPointe, Elizabeth Ashby, Janell Woodward	Made edits to Vulnerability Assessment portion of Section 3, Combined sec 3 profiles and Appendices
22 July 2013	D.D. LaPointe, Janell Woodward	Made edits to Vulnerability Assessment portion of Section 3, Combined sec 3 profiles and Appendices
23 July 2013	D.D. LaPointe, Janell Woodward	Made edits to Vulnerability Assessment portion of Section 3, Combined sec 3 profiles and Appendices
25 July 2013	D.D. LaPointe, Janell Woodward	Made edits to Vulnerability Assessment portion of Section 3, Combined sec 3 profiles and Appendices
26 July 2013	D.D. LaPointe, Janell Woodward	Made edits to Vulnerability Assessment portion of Section 3, Combined sec 3 profiles and Appendices
29 July 2013	D.D. LaPointe, Elizabeth Ashby, Janell Woodward	Made edits to Section 2, Section 3, and Appendices
30 July 2013	D.D. LaPointe, Elizabeth Ashby, Janell Woodward	Made edits to Section 2, and Appendices B, F, J, O, P, R
August 2013	D.D. LaPointe, Elizabeth Ashby, Janell Woodward	Week 1:Final edits to Sec. 3, 2; Worked on STAPLEE ranking of action items for Sec. 4, Appendices M, P, Q.

Table 2-3. Documentation of NHM Planning Team Meetings		
Date	**Update Planning Team Participants**	**What was accomplished**
		Week 2:Final edits to Sec. 3; Worked on STAPLEE ranking of action items for Sec. 4. Week 3: finalized the ranking of activities, prepared handouts for special meeting on the 29th. Week 4:Coordinated special for STAPLEE finalization; integrated Subcommittee's directives into final Section 4.
September 2013	D.D. LaPointe, Elizabeth Ashby, Janell Woodward	Week 1: Prepare meeting minutes of Aug 29, finalize Sections 2, 3 and 4 with several revisions to appendices as needed. Week 2: Submit plan to FEMA for courtesy review.

Table 2-4. NHMPC Subcommittee Meetings	
Meeting Date	**What was accomplished**
Jan 2011	NV Dept. of Information Technology reported on state's communication tower network and hazards affecting it. Rhett Milne reported on inclusion of climate change language into pertinent sections of the plan. Members were asked to provide hazard plan maintenance worksheet project information quarterly. FEMA Crosswalk Enhanced Plan review comments were read and there was discussion as to how we should address them.
April 2011	Revised HazMat section was introduced; MyPlan website presentation was made to the Subcommittee members by Gary Johnson and Jordan Hastings of NBMG. There was discussion of what new members are needed on the Planning Subcommittee and whom to invite. We reviewed the Plan for major changes needed in this iteration.
July 2011	New members were introduced and packets given to them with a CD of the current Nevada Hazard Mitigation Plan, a list of currently recognized hazards, a spreadsheet of the mitigation process, and an outline of the funding of the Plan. The Completed Mitigation Activity/Project Report Form was discussed
Oct 2011	Completed Mitigation Activity/Project Reports were collected, State hazard prioritization was initiated, members reported on any pertinent hazard mitigation news.
January 2012	Completed Mitigation Activity/Project Reports were collected, plan update process was introduced and discussed, simplified hazard ranking table was introduced and data discussed.
Special Meeting February 2012	State hazard prioritization continued; decision made to simplify ranking form 5 categories to just 3: "High", "Moderate/Significant", and "Low" to more closely parallel those used in most county/local plans. Planning Team showed composite table of all county/local/tribal plan hazards identified.
April 2012	All hazards were ranked for the state. Goals and Strategic actions were evaluated for continuing validity and some were edited and combined.
July 2012	Requested all edits to Hazard Profiles be in by Oct 3. Reviewed current Mitigation Goals and Strategic Actions for continued validity in the 2013 plan iteration. Reviewed new State URM building inventory.
October 2012	No quorum achieved
28 January 2013	Received input on members' Awareness and Outreach activities and completed mitigation activities. Reviewed and approved Sections Zero and One with minor revisions. Reviewed and approved Wildfire, Earthquake, Severe Winter Storm, and

	Drought Section Three profiles with minor edits and Flood profile (pending future amendment with irrigation canal data). Got feedback on Hazmat, and Terrorism/WMD profiles of Section 3.
29 April 2013	Reviewed and approved Sections 5 and 8 of the 2013 Enhanced NHMP with minor revisions. Reviewed and approved Hazard profile portions of Section 3 on Hazardous Materials; Terrorism & WMD with minor revisions. Goals and Strategic Actions from Section 4 were distributed to Subcommittee members for their review and input by May 10.
29 July 2013	Reviewed and approved Sections 4 and 6 of the 2013 Enhanced NHMP with edits. Reviewed and approved the flood profile portion of Section 3 with edits. Reviewed Appendices and Vulnerability Analysis portion of Section 3 and tabled approval until Special Meeting August 26, 2013. Distributed and discussed the STAPLEE ranking of strategic actions to be included in Section 4.
29 August 2013	Special meeting to review, discuss, rank and approve the STAPLEE ranking of strategic actions to be included in Section 4.

2.1.5 Which Sections of NHMP Were Revised in the Update Process

Table 2-5 below indicates which sections of the NHMP were revised as part of the 2013 update process and or added to the Plan and when each was approved by NHMPC. Details about specific revisions made to each section or subsection are included in that section and are also described in Table 2-3 above in the Planning Team meeting accomplishments.

Table 2-5. NHMP Revised Sections

Description	Updates Made Y/N?	Date Approved by NHMPC
Introduction	Y	
Section Zero - Overview	Y	28 Jan 2013
Section One – Adoption	Y	28 Jan 2013
Section Two – Planning	Y	with proposed additions of final meeting information Aug 13, 2013
Section Three – Risk Assessment	Y	Aug 13, 2013
Section Four – Mitigation Strategy	Y	Aug 13, 2013, with proposed edits.
Section Five – Local Coordination	Y	29 April 2013
Section Six – Plan Maintenance	Y	Aug 13, 2013
Section Seven - References	Y	Aug 13, 2013
Section Eight – Enhanced Plan	Y	29 April 2013
Appendix A - Adoption Resolution Document	Y	Aug 13, 2013
Appendix B - Participating Organizations	Y	Aug 13, 2013
Appendix C – NHMP Committee, Subcommittee & Bylaws	Y	Aug 13, 2013
Appendix D - Meeting agendas and minutes	Y	Aug 13, 2013
Appendix E - NV Admin Code Application for Emergency Assistance	N	Aug 13, 2013
Appendix F - HAZUS Earthquake Maps	Y	Aug 13, 2013
Appendix G – List of Dams by County	Y	Aug 13, 2013

Table 2-5. NHMP Revised Sections		
Description	**Updates Made Y/N?**	**Date Approved by NHMPC**
Appendix H –HAZUS Flood Maps for NV Rivers	Y	Aug 13, 2013
Appendix I - Federal and State Assurances	N	Aug 13, 2013
Appendix J – Wildfire Maps: Counties & State-Owned Buildings	Y	Aug 13, 2013
Appendix K – Extreme weather data	N	Aug 13, 2013
Appendix L – Noxious Weed Map link	Y	Aug 13, 2013
Appendix M – Estimated Losses from Earthquakes near Nevada Communities	Y	Aug 13, 2013
Appendix N – Revisions and status of mitigation strategy	Y	Deleted, Aug 13, 2013
Appendix N – (New) STAPLE-E Prioritization of Strategic Actions	Y	Aug 13, 2013
Appendix O– WSSPC Policies	Y	Aug 13, 2013
Appendix P – Completed Mitigation Activities	Y	Aug 13, 2013
Appendix Q –Miscellaneous Supporting Documents	Y	Aug 13, 2013
Appendix R – Nevada Ditches List & Reno Area Map	Y	Aug 13, 2013

2.2 COORDINATION AMONG AGENCIES

The requirements for coordination among agencies, as stipulated by the DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: PLANNING PROCESS

Coordination Among Agencies
Requirement §201.4(b): The State mitigation planning process **should** include coordination with other State agencies, appropriate Federal agencies, interested groups, and . . .

Element
- Does the **new or updated** plan describe how Federal and State agencies were involved in the **current** planning process?
- Does the **new or updated** plan describe how interested groups (e.g. businesses, non-profit organizations, and other interested parties) were involved in the **current** planning process?
- **Does the updated plan discuss how coordination among Federal and State agencies changed since approval of the previous plan?**

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

2.2.1 Involvement of Federal and State Agencies in the Planning Process

State agency personnel who also serve on the Subcommittee are listed in Table 2.1 in Section 2.1.2. Federal and state agencies that contributed to the update process are listed in Table 2-2 in Section 2.1.3. The composition of the Subcommittee adjusts to address compliance with requirements of the plan update process.

In addition to being represented on the Planning Subcommittee, Nevada's Tribal nations also work directly with FEMA in their planning process due to increased funding opportunities. The state continues to provide the tribes with technical assistance in their planning as requested.

The Wildland Urban Interface (WUI) is composed of multiple state and federal agencies that include U.S. Bureau of Land management, Nevada Cooperative Extension, U.S. Forest Service, Nevada Division of Forestry, Nevada Division of Emergency Management, local fire departments, and interested private citizens. The WUI meets regularly to plan an annual summit on Wildland Urban Interface fire mitigation issues for businesses and homeowners. Mitigation goals and strategies identified at these summits are then incorporated into both the local and state planning update process.

The Nevada Earthquake Safety Council is composed of representatives from Nevada Division of Emergency Management; University of Nevada, Reno; University of Nevada, Las Vegas; Nevada Public Agency Insurance Pool; Clark County Department of Development Services; Clark County School District; American Red Cross; Nevada Energy; urban governments; and private engineering, insurance, consulting, and casino companies. They meet quarterly and meetings may be attended by any interested parties including FEMA representatives, local building officials, local fire departments and emergency management coordinators, U. S. Department of Energy, and tribal representatives. The Council facilitates public input, develops consensus about seismic issues within the public and private sectors, and is the public advisory body for State seismic safety policy. The Subcommittee uses these policies in the planning process.

The Nevada Hazard Mitigation Planning Committee (NHMPC) includes members with expertise in floodplain management including representatives from the Clark County Flood Control District, Washoe County Water Resources, State Floodplain Manager, and Nevada Division of Water Resources. They provide flood mitigation and dam safety goals and strategies and review proposed updates to the plan. It also includes members of the Nevada Division of Forestry with expertise in wildfire mitigation. They provide wildfire mitigation goals and strategies and review proposed updates to the plan. The NHMPC also includes members from agencies such as NBMG with expertise in earthquake hazard mitigation who provide mitigation goals and strategies for earthquake hazards and review proposed updates to the plan.

2.2.2 Participation of Interested Groups in the Planning Process

Participation of private businesses, private non-profit groups (PNPs), and other interested parties is documented by their representation in NESC, NHMPC, and WUI Summit Committee as described in the previous section.

Voluntary Organizations Active in Disasters (VOAD) and Community Organizations Active in Disasters (COAD) are national and local faith-based groups that coordinate with state and federal emergency management agencies in assisting communities in recovering from disasters. The NDEM staff coordinates with these groups and incorporates their concerns into the planning process.

Citizens and interested groups are able to review the plan on the NDEM website (www.dem.state.nv.us) and provide input directly to the SHMO for use in the planning process. Notice is also provided to these groups through Facebook and Twitter.

Additionally, all Subcommittee and Committee meetings are posted according to the Nevada Open Meeting Law and teleconferencing information is noted on the agenda.

Increasing public involvement in the planning process was discussed at length in several meetings of the Subcommittee when it addressed FEMA's recommended revisions. The subcommittee reached a consensus that public involvement efforts must be a component of the local planning process and counties must bring those local concerns to the state. At the state level, the intent is mainly to keep the public aware of the planning process and to keep it open, accessible, and transparent to anyone who wishes to view it, which we do by posting it all on our website. The development of the MyPlan website has greatly increased the ability of the committee to make planning resources easily available to the locals and also provides them with a medium for communication of needs as well. Since the last iteration, the Planning Subcommittee and the NHMPC made the decision to move the NHMPC meetings to venues located around the state in local communities in an effort to elicit more participation from the public and local officials. These efforts have produced much additional public participation and interaction among stakeholders at both the local and state levels. The rural meeting venues provide valuable opportunities for networking and exchange of information on mitigation resources and concerns regarding local hazards. These NHMPC meetings in the local communities will continue, while funding is available, in order to provide support for local plan maintenance and development of additional tribal plans.

In order to encourage more direct public participation in the future plan update process in future iterations, a PowerPoint presentation on the purpose of the NHMPC and its mitigation program was developed by one NHMPC member and is available for educational and awareness use in public presentations and speaking engagements across the state.

About a year into this mitigation cycle, the Planning Team developed a form to monitor mitigation outreach and awareness activities by NHM Committee and Subcommittee members, which were then collected and assembled into a table presented at the end of Appendix B (B7. Hazard Mitigation Public Awareness and Outreach Activities to Other Groups).

These are examples of some of the venues where hazard mitigation information is shared with the public. This is by no means a comprehensive listing of all such activity by NHM Committee and Subcommittee members.

2.2.3 Changes in Federal and State Coordination

Cooperation among agencies in order to comply with Federal requirements for hazard mitigation planning has had the added effect of enhancing mutual awareness of the goals and functions of a wide variety of agencies, both federal and state. Working together on the planning and update process has helped members become more cognizant of common goals and opportunities for coordination of efforts in the mitigation planning process at the

state level. One example of this is the increased coordination among the Division of Water Resources, Division of Environmental Protection, and Division of Emergency Management to leverage resources in addressing environmental concerns related to mitigation activities, such as Nevada Clean Water and U.S. Clean Air Act programs. Another example of improved coordination of federal and state agency efforts is the increased cooperation among the entities participating in the WUI Summit meetings and the development of a web-based tool that allows locals to update their Community Wildfire Protection Plans (CWPPs). See program description online at this link:

http://www.livingwithfire.info/cwpp

This has resulted in both reduced fire risk to homes and businesses and increased awareness of funding opportunities to communities for implementing strategies. Yet another example is in the increased inclusion of NESC issues and strategies in earthquake hazard mitigation plan update process. Increased communication between FEMA and state agencies such as NBMG and Seismology at UNR has resulted in development and implementation of new tools (HAZUS, MyPlan) for earthquake risk assessment and loss estimation. Increased federal and state agency coordination in the planning process has greatly enhanced awareness, cooperation, and the leveraging of resources in the implementation of mitigation strategies.

2.2.4 Silver Jackets Program

Federal agencies, including the U.S. Army Corps of Engineers (USACE) and the Federal Emergency Management Agency (FEMA), are partnering to form a unified forum to address Nevada's flood risk management priorities. Developed at the state level, Nevada Division of Emergency Management and the Nevada Division of Water Resources have formed an active Silver Jackets program that provides a formal and consistent strategy for an interagency approach to planning and implementing measures to reduce the risks associated with flooding and other natural hazards. Involvement from other federal, state, regional, local, and tribal groups within this program will improve and increase flood risk communication with a unified interagency message and help collaboration on flood mitigation, response, and recovery.

2.3 PROGRAM INTEGRATION

DMA 2000 REQUIREMENTS: PLANNING PROCESS

Program Integration
Requirement §201.4(b): The State mitigation planning process **should** be integrated to the extent possible with other ongoing State planning efforts as well as other FEMA mitigation programs and initiatives.

Element
- Does the **new or updated** plan describe how the State mitigation planning process is integrated with other ongoing State planning efforts?
- Does the **new or updated** plan describe how the State mitigation planning process is integrated with FEMA mitigation programs and initiatives?

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

2.3.1 Integration of Existing Plans

The primary way in which Nevada integrates the State mitigation planning process with other ongoing State planning efforts is by having members of the NHMPC and planning subcommittee who also serve as primary managers of specific programs directly involved in hazard mitigation. Their expertise across a broad spectrum of hazards provides a framework for networking and integration of the NHMP with other ongoing state planning efforts. Specific examples of this mechanism for integration of plans are presented in Table 2-6 below, organized by hazard.

Table 2-6. Integration of the NHMP with other State Planning Efforts

Hazard	Name of plan/website reference	Codes and Regulations	Plan description Mechanism for Integration
All hazards	City Planning	NRS 623 - Architecture, Interior Design and Residential Design	Development Has members in common with NHMPC/Subcommittee
All hazards	Community Master Plans	NRS 278.160 – Planning and Zoning	Conservation and Development This plan's goals and the NHMP's goals are both to reduce losses. Has members in common with NHMPC/Subcommittee
All Hazards	County Hazard Mitigation Plans		Risk analysis and mitigation plans of local hazards This plan's goals and the NHMP's goals are both to reduce losses. Risk assessment data and action items are incorporated into Sections 3 and 4 of this plan. Has members in common with NHMPC/Subcommittee

Table 2-6. Integration of the NHMP with other State Planning Efforts			
Hazard	**Name of plan/website reference**	**Codes and Regulations**	**Plan description** **Mechanism for Integration**
All Hazards	Local Hazard Mitigation Plans Reference: http://dem.state.nv.us		Provide planning and project grants for hazard mitigation These plan goals and the NHMP's goals are both to reduce losses. Have members in common with NHMPC/Subcommittee
All Hazards	Nevada Natural Resource Plan Reference: http://dcnr.nv.gov/nrp/home.htm	NRS 548 – Conservation	Conservation of Nevada's natural resources This plan's goals and the NHMP's goals are both to reduce losses Has members in common with NHMPC/Subcommittee
All Hazards	Open Space Plan	NRS 376A – Taxes for development of open space land	Development and use for open space land for 20 years This plan's goals and the NHMP's goals are both to reduce losses.
All Hazards	State Comprehensive Emergency Management Plan	NRS 414	This is the over-arching plan for the emergency management program in Nevada. This plan's goals and the NHMP's goals are both to reduce losses. Has members in common with NHMPC/Subcommittee.
Dam Failure	Nevada Dam Safety Reference: http://water.nv.gov/Engineering/Dams/	NRS 535- Dams and other Obstructions	Promote safe construction and operation of dams and prevent loss of life and property. This plan's goals and the NHMP's goals are both to reduce losses. Has members in common with NHMPC/Subcommittee
Drought	Drought Plan -2003 Reference: http://water.nv.gov/WaterPlanning/pub-list.cfm	NRS 540 – Planning and Development of Water Resources	Recording and reporting mechanism for drought management. This plan's goals and the NHMP's goals are both to reduce losses. County emergency managers participate in both this plan and NHMPC/Subcommittee.
Drought	Nevada State Water Plan Reference: http://water.nv.gov/WaterPlanning/pub-list.cfm	NRS 540 – Planning and Development of Water Resources	Framework for water planning and management This plan's goals and the NHMP's goals are both to reduce losses. Has members in common with NHMPC/Subcommittee
Drought	Southern Nevada Water Authority Drought Plan		Sustain and promote water goals in Southern Nevada. This plan's goals and the NHMP's goals are both to reduce losses. Has members in common with NHMPC/Subcommittee.

Table 2-6. Integration of the NHMP with other State Planning Efforts			
Hazard	**Name of plan/website reference**	**Codes and Regulations**	**Plan description** **Mechanism for Integration**
Earthquake	Strategic Plan for Earthquake Safety in Nevada Reference: http://www.nbmg.unr.edu/nesc/strat.pdf		Goals are to reduce losses due to earthquakes in Nevada. This plan's goals and the NHMP's goals are both to reduce losses. Has members in common with NHMPC/Subcommittee.
Earthquake	Nevada Earthquake Risk Mitigation Plan www.nbmg.unr.edu/nesc/NERMP.pdf		Goal is to reduce losses due to earthquakes in Nevada. This plan's goals and the NHMP's goals are both to reduce losses. Has members in common with NHMPC/Subcommittee.
Earthquake	Nevada Earthquake Safety Council www.nbmg.unr.edu/nesc	NRS 414	Goal is to reduce losses due to earthquakes in Nevada. This plan's goals and the NHMP's goals are both to reduce losses. Has members in common with NHMPC/Subcommittee.
Flood	Nevada Floodplain Management Program		Monitor and implement the Community Assistance Program, the Flood Mitigation Assistance Program, and the Statewide Flood Management and Mitigation Plan This plan's goals and the NHMP's goals are both to reduce losses. Has members in common with NHMPC/Subcommittee
Flood	Statewide Floodplain Management/Mitigation Planning Reference: http://water.nv.gov/Flood/page5.htm	Floodplain Management Ordinance for Nevada Communities	Minimize public and private losses due to flooding This plan's goals and the NHMP's goals are both to reduce losses. Has members in common with NHMPC/Subcommittee.
Flood	Truckee River Flood Management		"The Living River Plan" This plan's goals and the NHMP's goals are both to reduce losses. Has members in common with NHMPC/Subcommittee.
Wildfire	Community Wildfire Protection Plans (CWPP)		Rating and risk analysis of fire danger in "Communities at Risk" by county This plan's goals and the NHMP's goals are both to reduce losses. Some goals and objectives were carried into this plan. Has members in common with NHMPC/Subcommittee

Table 2-6. Integration of the NHMP with other State Planning Efforts			
Hazard	**Name of plan/website reference**	**Codes and Regulations**	**Plan description** **Mechanism for Integration**
Wildfire	Western Governors Assn. 10 year Comprehensive Strategy and Implementation Plan: National Fire Plan, USFS Reference: http://www.forestsandrangelands.gov/		Agency mitigation and response to wildland fires This plan's goals and the NHMP's goals are both to reduce losses. Has members in common with NHMPC/Subcommittee

2.3.2 Implementation of State Mandates at the Local Level

In Nevada, any State mandate approved by the State legislature must also be approved by the county and city governing body before it can be implemented at the local jurisdiction. Counties are required by NRS 278.160 to integrate hazard mitigation actions with planning and development at the local level.

2.3.3 Integration of the NHMP with FEMA Programs and Initiatives

State and local mitigation efforts are enhanced and promoted by FEMA programs nationwide and in Nevada specifically. In order to apply for FEMA mitigation funding, communities must first develop their own mitigation plans that are consistent with both FEMA programs and initiatives and NHMP guidelines. All counties in Nevada either have approved plans or are in the plan development process, some in cooperation with other counties.

Some of the major state-administered FEMA-funded hazard mitigation programs for which communities and tribal entities can qualify by adherence to the NHMP are described in Table 2-7 below:

Table 2-7. Integration of NHMP and Local Mitigation Plans with FEMA Mitigation Programs and Initiatives		
Hazard	**Program**	**Mechanism for Integration**
All hazards	**Hazard Mitigation Grant Program** To provide funds to governments and communities to significantly reduce or permanently eliminate future risk to lives and property from natural hazards. HMGP funds projects identified in the community's hazard mitigation plan and enables the implementation of mitigation measures during the recovery from a disaster.	Parallel goals, objectives and action items among FEMA programs, NHMP, and local plans
All hazards	**HAZUS MH** HAZUS-MH is a nationally applicable standardized methodology and software program that uses models to estimate potential losses from earthquakes, floods, and hurricane winds. Estimating losses is essential to decision making at all levels of government, providing a basis for developing mitigation plans and policies, emergency preparedness, and response and recovery planning.	In Nevada, UNR uses HAZUS to generate the potential loss data on which mitigation plans at all levels are based
All hazards	**Pre-Disaster Mitigation** Pre-Disaster Mitigation (PDM) is a Federal program administered by FEMA, which funds a) local and state mitigation planning to meet the requirements of DMA 2000 and b) mitigation projects.	Parallel goals, objectives and action items among FEMA programs, NHMP, and local plans
Dam failure	**National Dam Safety Program (NDSP)** This program is a partnership of state and federal agencies with other stakeholders to encourage individual and community responsibility for dam safety. The program includes; grant assistance to states, dam safety research and dam safety training.	Parallel goals, objectives and action items among FEMA programs, NHMP, and local plans
Earthquake	**National Earthquake Hazard Reduction Program (NEHRP) has** four basic goals: • Promote understanding of earthquakes and their effects • Work to better identify earthquake risk • Improve earthquake-resistant design and construction techniques • Encourage the use of earthquake-safe policies and planning practices	Parallel goals, objectives and action items among FEMA programs, NHMP, and local plans
Flood	**National Flood Insurance Program (NFIP)** NFIP enables property owners in participating communities to purchase flood insurance as protection against flood losses, while requiring state and local governments to enforce floodplain management ordinances that reduce future flood damages.	Parallel goals, objectives and action items among FEMA programs, NHMP, and local plans
Flood	**Community Rating System (CRS)** This is a voluntary program recognizing and encouraging community floodplain management activities that exceed the NFIP's minimum standards.	Parallel goals, objectives and action items among FEMA programs, NHMP, and local plans
Flood	**Cooperating Technical Partners (CTP)** This program creates partnerships between FEMA and participating NFIP cooperators having an interest and capability to become more active participants in the FEMA Flood Hazard Mapping Program.	Parallel goals, objectives and action items among FEMA programs, NHMP, and local plans
Flood	**Flood Map Modernization** This federal program provides up-to-date maps to support a flood insurance program that is more closely aligned with actual risk, encourage wise floodplain management, and increase the public's flood hazard awareness. In Nevada, Clark County's flood maps have been up-dated. Washoe County's maps are in the process of being digitized.	Parallel goals, objectives and action items among FEMA programs, NHMP, and local plans

Table 2-7. Integration of NHMP and Local Mitigation Plans with FEMA Mitigation Programs and Initiatives		
Hazard	**Program**	**Mechanism for Integration**
Flood	**Flood Mitigation Assistance** To implement cost-effective measures that reduce or eliminate the long-term risk of flood damage to structures insured under the NFIP.	Parallel goals, objectives and action items among FEMA programs, NHMP, and local plans
Flood	**Repetitive Flood Claim** To reduce or eliminate the long-term risk of flood damage to structures insured under the NFIP that have one or more claim payment(s) for flood damages.	Parallel goals, objectives and action items among FEMA programs, NHMP, and local plans
Flood	**Severe Repetitive Loss Program** To reduce or eliminate the long-term risk of flood damage to severe repetitive loss properties and the associated drain on the National Flood Insurance Program (NFIP).	Parallel goals, objectives and action items among FEMA and federal programs, NHMP, and local plans

This Section includes the identification, profiling and ranking of hazards in the State of Nevada. It documents the process and resources used to asses risk and vulnerability throughout the state resulting in the foundation to build the strategy for mitigation of the identified risks. *Updates to this section include, the simplification from five risk categories to three, in order to mirror the categorization format used by the majority of local approved plans; addition of a subsection to flooding entitled Flooding Along Irrigation Ditches and Canals; the GIS analysis of the vulnerability for wildfire risk. All other sections were updated with new occurrences of hazards and the HAZUS database was updated to include potential URM building inventory. A single condensed Vulnerability Analysis section for highest-ranked hazards, Earthquake, Flood, and Wildfire is included at the end of Section Three.*

The requirements for risk assessment are described below:

DMA 2000 REQUIREMENTS: RISK ASSESSMENT OVERVIEW

Risk Assessment

Requirement §201.4(c)(2): The State plan **must** include a risk assessment that provides a factual basis for activities proposed in the strategy portion of the mitigation plan. Statewide risk assessments must characterize and analyze natural hazards and risks to provide a statewide overview. This overview will allow the State to compare potential losses throughout the State and to determine their priorities for implementing mitigation measures under the strategy, and to prioritize jurisdictions for receiving technical and financial support in developing more detailed local risk and vulnerability assessments.

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

3.1 OVERVIEW OF RISK ASSESSMENT

A risk assessment requires the collection and analysis of hazard-related data to enable the State to identify and prioritize mitigation actions that will reduce losses from potential hazards. There are five risk assessment steps in the hazard mitigation planning process, as outlined below:

Step 1: Identify and Screen Hazards

Hazard identification is the process of recognizing natural and human-caused events that threaten an area. There are two general categories of hazards: Natural and human-caused:

- Natural hazards result from unexpected or uncontrollable natural events of sufficient magnitude to cause damage.
- Human-caused hazards result from human activity and include technological hazards and terrorism.

Hazards are identified by investigating past history of occurrence of these hazards and by gathering scientific data indicating prehistoric occurrences and likelihood of recurrence of these hazards. Even though a particular hazard may not have occurred in recent history in the study area, all hazards that may potentially affect the study area are initially considered. This screening and categorization process will allow us to concentrate efforts on developing mitigation strategies for those hazards categorized as higher risk.

Step 2: Profile Hazards

Hazards are profiled by first collecting data on the location, previous occurrence and probablility of future occurrence of each natural hazard. After these data are collected, each hazard is categorized based on these data. It is helpful in the profiling process to review existing plans and studies and use maps where appropriate.

Step 3: Identify Assets

Assets are defined as population; buildings; critical facilities and infrastructures; economic resources; cultural and environmental resources that may be affected by hazard events.

Step 4: Assess Vulnerabilities

A vulnerability analysis predicts the extent of exposure that may result from a hazard event of a given intensity in a given area. The assessment provides quantitative data that may be used to identify and prioritize potential mitigation measures by allowing the State to focus attention on areas with the greatest risk of damage.

Step 5: Analyze Potential Losses

The final stage of the risk assessment process provides a general overview of vulnerable populations, structures, critical facilities and resources in hazardous areas. This information provides groundwork for decisions about where the mitigation strategies would be most effective. A useful modeling tool to accomplish this is HAZUS, a risk assessment software program developed by FEMA to analyze potential losses from floods, hurricane winds, and earthquakes. HAZUS couples current scientific and engineering data with geographic information systems (GIS) technology to produce estimates of hazard-related damage before, or after, a disaster occurs.

3.2 NEVADA'S RISK ASSESSMENT PROCESS

The requirements for hazard identification, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: RISK ASSESSMENT

Identifying Hazards

Requirement §201.4(c)(2)(i): The State risk assessment **shall** include an overview of the type of all hazards that can affect the State.

Element

Does the **new or updated** plan provide a description of the type of **all natural hazards** that can affect the State?

If the hazard identification omits (without explanation) any hazards commonly recognized as threats to the State, this part of the plan cannot receive a satisfactory score.

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

3.2.1 Identifying and Screening Hazards

NMHP Subcommittee reviewed FEMA's listing of hazards to ascertain if any new hazards specific to Nevada were missing from the FEMA list or if any hazards previously removed needed to be reconsidered as pertinent to Nevada. The subcommittee then used state-specific data, recent occurrence of natural disasters, local plans, and the individual expertise of its members to screen the list for those hazards that should be profiled for Nevada. The data in Table 3-1 below are the result of this screening process. There were some slight modifications to the list from the 2010 plan based on recategorization and regrouping of hazards, specifically: canal failure and dam failure were removed from the list as individual hazards and included under flooding. Severe weather hazards were identified and profiled individually according to their character. Climate change was discussed and the subcommittee decided that it will be considered where appropriate for its effect on individually profiled hazards. Technological failure such as widespread utility loss was discussed by the subcommittee and consensus was reached that it needs to be researched and presented for the next plan iteration.

Table 3-1. Identification and Screening of Hazards Affecting Nevada

Hazard Type	Should It Be Profiled?	Explanation
Natural Hazards		
Avalanche	Yes	Avalanches affect a small portion of the State—Tahoe, Lee Canyon, and Ruby Mountains.
Coastal storm	No	Nevada is not located in an area prone to coastal storms.
Coastal erosion	No	Nevada is not located in an area prone to coastal erosion.
Drought	Yes	Statewide drought declarations were issued in 2002 and 2004.
Earthquake	Yes	Nevada ranks as the third state in frequency of large earthquakes over the last 150 years.
Epidemic	Yes	This hazard could cause an extreme economic downturn for the State of Nevada particularly in the casino industry.
Expansive soil	Yes	Expansive soils have caused infrastructure damage in the Reno-Sparks area.
Flood	Yes	Flood damage occurs regularly in Nevada. Flooding may result from rapid snow-melt, thunderstorm-induced flash floods, mudslides, dam failure, or failure of canal walls.
Hail and thunderstorm	Yes	The entire state is susceptible to thunderstorms which may cause localized flooding and wildfire.
Heat extreme	Yes	This hazard can affect areas across the entire state.
Infestation	Yes	Infestations impact Nevada's economy through the direct destruction of crops and natural resources as well as indirectly by increasing susceptibility to wildfire.

Table 3-1. Identification and Screening of Hazards Affecting Nevada		
Hazard Type	**Should It Be Profiled?**	**Explanation**
Landslide	Yes	In Nevada, rockslides are more common than the normal landslide seen in other areas. They tend to be localized; however, this hazard can occur with earthquakes, major storms, floods, and melting ice and snow.
Severe winter storm and extreme snowfall	Yes	Normally Nevada can handle winter storms except when these storms are severe.
Land subsidence and ground failure	Yes	The southern part of the State is particularly vulnerable to land subsidence due to groundwater extraction. Other parts of the state are also affected by subsidence or more rapid ground failure due to mine dewatering or the presence of underground mine workings adjacent to populated areas. *(Definition has been expanded)*
Tornado	Yes	Although tornados in Nevada are rare, they do occur.
Tsunami/seiche	Yes	Lake Tahoe could have 10-meter-high waves generated by an earthquake under or adjacent to the lake.
Volcano	Yes	Nevada is downwind from potential volcanic eruptions, most importantly Mammoth Lakes, Mt. Lassen, and Mt. Shasta, California. Major eruptions could cause ashfall in Nevada.
Wildfire	Yes	The terrain, vegetation and weather conditions in the State of Nevada are favorable for the ignition and rapid spread of wildland fires.
Windstorm	Yes	All counties in Nevada are susceptible to severe and strong windstorms which have caused property damage.
Human-caused		
Hazmat	Yes	All Hazardous Materials events preparedness, planning, response and mitigation efforts are addressed by the State Emergency Response Commission, the State Fire Marshal, and the Department of Conservation and Natural Resources.The Hazmat profile was written with significant input from many Subcommittee members including NDOT under whose jurisdiction highway hazmat incidents fall.
Terrorism/WMD (Weapons of Mass Destruction)	Yes	All Terrorism/WMD preparedness, planning, response and mitigation efforts are addressed by the Office of Homeland Security. The Terrorism/WMD plan profile was written with significant input from the Nevada Threat Assessment Center (NTAC) staff under whose jurisdiction this falls.

3.2.2 Prioritization of Hazards

The Nevada Hazard Mitigation Planning Committee used four criteria to prioritize the hazards likely to affect the State of Nevada. These four criteria are as follows:

- Probability/frequency
- Magnitude/severity (includes economic impact, area affected, and vulnerability)
- Warning time
- Duration of loss of critical facilities and services

The Subcommittee members assigned values of 1 through 5 for each criterion based on the descriptions given in the hazard prioritization criteria table below, Table 3-2. This allowed the Planning Team to assign some numerical values to the criteria in order to arrive at the rankings of the screened hazards shown on the Hazard Prioritization Worksheet Results, Table 3-3. Some of the criteria however are difficult to quantify numerically and compare so the various expertise of Subcommittee members was relied upon in discussions to finalize rankings of profiled hazards.

Table 3-2. Hazard Prioritization Criteria

Criterion	Value	Category	Description
Probability/Frequency	1	Very Low	Occurs less than once in 1000 years
	2	Low	Occurs less than once in 100 to once in 1000 years
	3	Medium	Occurs less than once in 10 to once in 100 years
	4	High	Occurs less than once in 5 to once in 10 years
	5	Very High	Occurs more frequently than once in 5 years
Magnitude/ Severity (includes Economic Impact, Area Affected and vulnerability)	1	Very Low	▪ Negligible property damages (less than 5% of all buildings and infrastructure) ▪ Negligible loss of quality of life ▪ Local emergency response capability is sufficient to manage the hazard
	2	Low	▪ Slight property damages (5% to 15%) of all buildings and infrastructure) ▪ Slight loss of quality of life ▪ Emergency response capability of the city or surrounding community is sufficient to manage the hazard
	3	Medium	▪ Moderate property damages (15% to 30% of all buildings and infrastructure) ▪ Some loss of quality of life ▪ Emergency response capability, economic, and geographic effects of the hazard are of sufficient magnitude to involve one or more counties
	4	High	▪ Moderate property damages (30% to 50% of all buildings and infrastructure) ▪ Moderate loss of quality of life ▪ Emergency response capability, economic, and geographic effects of the hazard are of sufficient magnitude to require state assistance
	5	Very High	▪ Property damages to greater than 50% of all buildings and infrastructure.

Table 3-2. Hazard Prioritization Criteria			
			▪ Significant loss of quality of life ▪ Emergency response capability, economic, and geographic effects of the hazard are of sufficient magnitude to require federal assistance
Warning Time	1	Very Low	> 48hrs
	2	Low	24 to 48 hrs
	3	Medium	12 -24 hrs
	4	High	24 to 48 hrs
	5	Very High	<6 hrs
Duration of loss of critical facilities and services.	1	Very Low	1 to 3 days
	2	Low	4 to 7 days
	3	Medium	8 to 14 days
	4	High	15 to 20 days
	5	Very High	More than 20 days

Table 3-3. Hazard Prioritization Worksheet Results

	Totals from subcommittee members													OVERALL	RANK
	A	B	C	D	E	F	G	H	I	J	K	L	M	TOTAL	
NATURAL HAZARDS															
Earthquake	18	20	17	19	14	18	16	15	19	17	17	17	14	**221**	**1**
Wildfire	17	14	13	19	12	18	12	14	18	15	12	13	15	**192**	**2**
Flood (includes flash flood, canal wall failure, dam failure, mudslide)	14	18	14	18	12	10	12	14	17	15	14	14	16	**188**	**3**
Terrorism/WMD	13	12	13	13	16	17	15	12	16	11	13	12	10	**173**	**4**
Hazardous materials	11	11	10	11	12	18	10	13	16	12	13	12	12	**161**	**5**
Drought	13	9	10	8	13	14	12	16	10	13	11	11	11	**151**	**6**
Tsunami/seiche	14	12	5	11	15	12	8	15	15	9	4	8	10	**138**	**7**
Hail and thunderstorm	9	11	11	11	12	9	11	13	8	9	7	11	11	**133**	**8**
Severe winter stormand extreme snowfall	11	11	10	8	7	14	9	10	12	10	8	11	11	**132**	**9**
Epidemic	10	10	6	7	8	12	11	17	11	10	10	10	9	**131**	**10**
Avalanche	10	12	9	8	10	13	10	6	11	10	12	8	11	**130**	**11**

Table 3-2. Hazard Prioritization Criteria

Windstorm	9	11	7	8	8	8	8	9	13	11	8	11	13	**124**	**12**
Landslide	9	12	6	9	11	8	11	11	11	8	4	8	12	**120**	**13**
Heat, extreme	8	9	8	7	8	10	10	11	10	10	8	10	10	**119**	14
Tornado	7	10	5	9	13	8	5	13	10	8	5	9	12	**114**	**14**
Infestation	6	9	10	7	7	10	9	10	8	7	7	4	10	**104**	**15**
Land subsidence/ground failure	9	7	8	6	7	8	7	10	10	7	6	9	7	**101**	**16**
Volcano	6	10	4	8	5	8	7	12	10	8	0	8	8	**94**	**17**
Expansive soil	6	8	6	7	5	6	9	7	9	7	4	8	8	**90**	**18**

3.2.3 Categorization of Screened Hazards

Using the above values for the four criteria listed, the 2011 Planning Subcommittee assigned each of the profiled hazards to one of the following risk categories based on an evaluation of the factors listed for each. Subcommittee members also provided input to the final ranking based on their respective areas of expertise.

- **High Risk:** Immediate action necessary. Beyond the State's available resources and ability to respond alone. Causes substantial property loss and financial impact to the entire State. Critical facilities and/or services may be lost for 15-20 days or more. May occur often or once in five to ten years. Up to 26 to 35% of property (or more) is lost or damaged in the affected area.
- **Medium/Significant Risk:** Prompt action necessary which ranges from being beyond the State's available resources and ability to respond to handled at county level. Critical facilities and/or services may be lost for 8-14 days. Effects are felt at the county level. May occur frequently to less than once in 10 to 100 years. Between 11% and 25% of property is lost or damaged within the affected area.
- **Low Risk:** Should be planned for in the future. Within the State's or affected community's ability to respond with available resources. Critical facilities and/or services may be lost for 1-7 days. An entire town or city may be affected, may occur frequently or less than once in 100 to 1000 years, or less than 5% to 10 % of property lost or damaged within the affected area

After assessing the information from the NHMP Subcommittee members' Hazard Prioritization Worksheets, risk categories of High, Medium/Significant, or Low were assigned to the hazards most likely to occur in the State of Nevada as shown below in 3-4. This is a simplification from the five categories used in the 2010 HMP and Subcommittee members recommended the change as it more closely mirrors the categories used by the local plans in the State. Due to the limited resources available, the Planning Subcommittee will focus on the development of mitigation strategies for those hazards categorized as High Risk. As more resources become available and mitigation activities are completed, additional mitigation strategies can be developed for lower-ranked hazards.

Table 3-4. Risk Categories Assigned to Nevada hazards

High Risk	Medium/Significant Risk	Low Risk
Earthquake	Terrorism/WMD	Tsunami/seiche
Wildfire	Hazardous Materials	Hail and thunderstorm
Flood	Drought	Avalanche
	Severe winter storm and extreme snowfall	Epidemic
		Windstorm
		Landslide
		Heat, extreme
		Tornado
		Infestation
		Land Subsidence
		Volcano
		Expansive Soil

3.3 PROFILING HAZARDS

Once the screening and prioritization process was completed, the Subcommittee moved on to Step 2 of the Risk Assessment process, the profiling of hazards. The requirements for profiling hazards as stipulated in DMA 2000 and its implementing regulations are described below.

DMA 2000 REQUIREMENTS: RISK ASSESSMENT

Profiling Hazards

Requirement §201.4(c)(2)(i): The State risk assessment **shall** include an overview of the location of all natural hazards that can affect the State, including information on previous occurrences of hazard events, as well as the probability of future hazard events, using maps where appropriate … .

Element

Does the risk assessment identify the **location** (i.e. geographic area affected) of each natural hazard addressed in the **new or updated** plan?

Does the **new or updated** plan provide information on **previous occurrences** of each hazard addressed in the plan?

Does the **new or updated** plan include the **probability of future events** (i.e. chance of occurrence) for each hazard addressed in the plan?

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

The specific hazards profiled in the Nevada HMP have been examined in a methodical manner based on the following factors:

- Nature
- History (previous occurrences)
- Location, severity, and probability of future events

All of the screened hazards were profiled. However, a vulnerability assessment to include loss estimates to State facilities was conducted only for those natural hazards categorized as High Risk: wildfire, flood, and earthquake.

The National Weather Service representative on the Subcommittee was consulted and provided statements regarding the effect of climate change on severity and probability of future events that are included in all weather-related hazard profiles.

The table of hazard ratings for the local jurisdictions (counties, communities, or tribal entities) that was included in each profile of the 2010 iteration of the NHMP was not included in the present plan; instead, this data has been summarized in Tables 3-33 and 3-34 in Section 3.4 that follows the hazard profiles. This information was derived from each County's hazard mitigation plan (approved or in development) or from the 2007 Hazard Risk Assessment Survey completed by County Emergency Managers and tribal entities.

The profiled hazards are presented below in Section 3.3 in alphabetical order. The order of presentation does not signify the level of importance or risk.

3.3.1 **Avalanche** (Low Risk)

3.3.1.1 *Nature*

An avalanche occurs when a mass of snow detaches from a mountainside and slides or falls downward. Snow avalanches can be subdivided into loose-snow avalanches and slab (dry or wet) avalanches. Wet slide avalanches may occur during and after (a) a rapid rise in air temperature inducing a melting snow pack, (b) a rain-on-snow event, and (c) during the spring thaw. The majority of slab avalanches occur on natural slopes between 25 to 50 degrees, although snow avalanches have been recorded on slopes as low as 15 degrees depending on snow type, water content, temperature, and snow- and wind-loading on the existing snow pack. Over 80% of fatalities are triggered by the victims themselves as a result of loading the snowpack by skiing, boarding or snowmobiling. The snowpack varies within the state, with a maritime snow climate, relatively heavy snowfall and mild temperatures in western and southern Nevada, whereas northeastern Nevada (Ruby Mountains) is somewhat transitional between maritime and continental (Utah and Colorado), characterized by low snowfall and colder temperatures.

The following three variables interact to determine whether an avalanche is possible:

1. Terrain: the slope must be steep enough to avalanche.
2. Snowpack: the snow must be unstable enough to avalanche.
3. Weather: Weather is another important variable. Changing weather can quickly increase instability.

3.3.1.2 *History*

The avalanche history in Table 3-5 below was gathered from a variety of resources and includes adjacent areas of the northern Sierra Nevada in California that would impact emergency services in northern Nevada. It includes data from the annual reports of the Sierra Avalanche Center Annual Reports. This information is used in creating daily avalanche advisories available to the general public. It generally includes only those avalanches which caused injury, death, evacuations, or substantial property damage.

Table 3-5. History of Nevada and Adjacent Sierra Nevada Avalanche Occurrences

Date	Location	Description/injuries/damages
7 April 1882	Genoa area, NV	18 deaths and many residences destroyed.
13-16 January 1952	Sierra Nevada west of Reno	A*valanches* trapped a Southern Pacific Railroad's *City of San Francisco* passenger train for several days, causing m*any illnesses and one death.*
1968	Echo Subdivision Kyle Canyon, Clark Co, NV	2 deaths.
2 January 1969	Slide Mountain at Mount Rose ski area, NV	One death.
29 January 1972	Mount Rose Ski area, NV	7 buried with injuries, 2 deaths at "The Chutes" ski area.

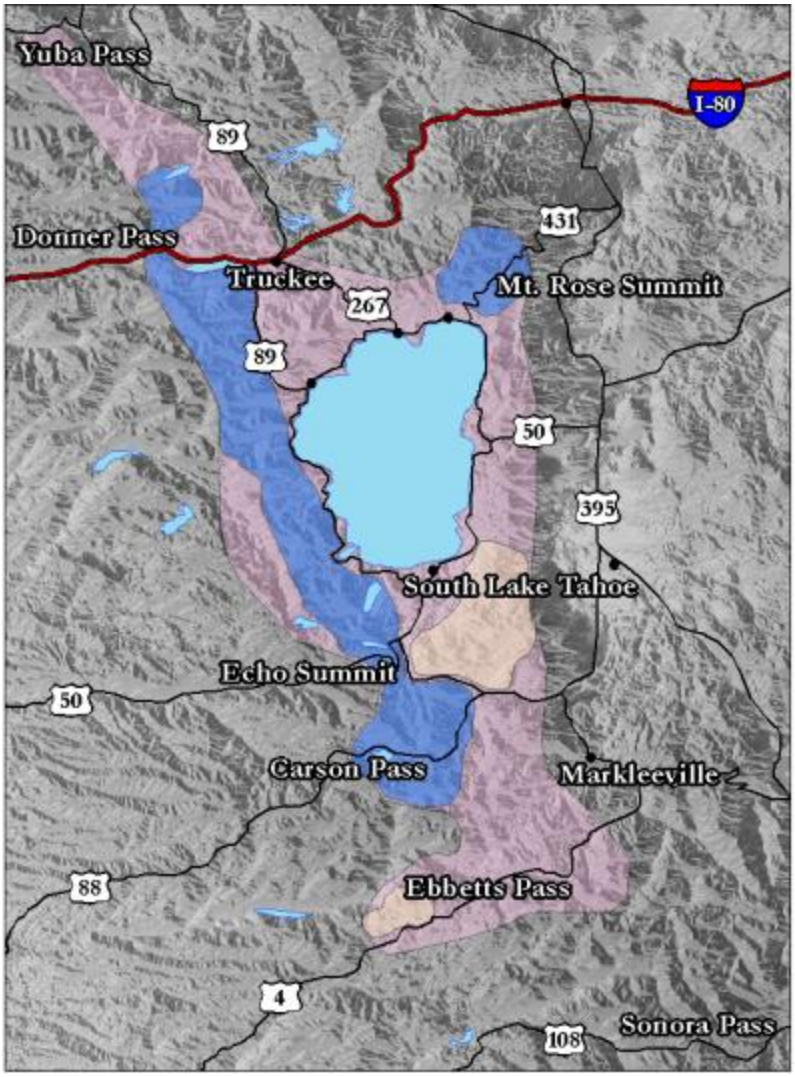
31 March 1982	Alpine Meadows Ski Area, near Lake Tahoe, CA	7 people killed, 5 others injured, several buildings, chair lifts and vehicles destroyed or damaged; total monetary loss of approximately 1.6 million dollars.
Feb 9, 1985	Squaw Valley, CA	100 houses evacuated; I-80 and U.S. 50 closed; no deaths or injuries.
18 February 1986	Sierra Nevada, NV	Avalanches blocked both I-80 and Amtrak train tracks west of Reno. No deaths or injuries directly related.
23 December 1996	Sugar Bowl ski area, Sierra Nevada CA	An avalanche buried and killed a snowboarder.
12 Feb 1998	Near Donner Ski Ranch, Sierra Nevada	A snowboarder was swept away and killed in an avalanche.
6 Feb 1999	Sierra Nevada near Truckee, CA	An avalanche buried four people, killing one, injuring three along the shore of a lake 35 miles west of Reno.
22 February 2001	Alpine Meadows ski area, Sierra Nevada	Two 17-year-old boys were killed by an avalanche.
15 December 2002	Mt. Rose ski resort, NV	One death, two injured by avalanche in out out-of-bounds area.
8 March 2002	Donner Pass Ski area, Sierra Nevada	Avalanche kills one skier.
26 April 2003	South of Lake Tahoe, Sierra Nevada	One snowmobiler was killed in an avalanche.
1 Jan 2004	Boreal Ridge Ski area, Sierra Nevada	Avalanche caused one fatality.
4 Jan 2004	Sierra Nevada near Truckee, CA	Avalanche buries skiers and snowboarders; multiple injuries.
9 Jan 2005	Lee Canyon, Mount Charleston, NV	An avalanche swept one Las Vegas boy off a ski chair lift to his death at Las Vegas Ski & Snowboard Resort.
10 Jan 2005	Sierra Nevada, CA, NV	A*valanche* danger closed the main highways over the Sierra Nevada. No injuries.
2 February 2006	Sierra Nevada	Avalanche near Twin Lakes in Sierra Nevada buried three skiers, one died; two dug out with injuries.
April 2005	Sierra *Nevada*	A*valanche* buried two women skiers on Mount Tom along the California-N*evada* border–both died.
21 February 2005	Sugar Bowl/ Squaw Valley ski resorts, Sierra Nevada	Avalanche trapped 3 cross-country skiers north of Lake Tahoe. One died, 2 dug out with minor injuries.
12 February 2007 Mount Rose ski area	Mount Rose ski area, NV	Avalanche severely injured one ski patrol member at Extreme Chutes of Ski Tahoe resort.
27 February 2007	Ruby Mountains Elko County, NV	Avalanches in Ruby Mountains threatened snowmobilers and skiers. No deaths or injuries.
Dec 2008	Squaw Valley ski resort, CA	Avalanche kills one skier
4 March 2009	Squaw Valley USA ski resort, Sierra Nevada	Avalanche killed one ski patrol member working on avalanche control.
22-23 Dec 2010	Kyle Canyon and Echo Canyon in Mt. Charleston area	Three avalanches in Clark County caused power outages and home evacuations, buried vehicles, and closed ski areas.
25 April 2011	Split Mountain, Sierra Nevada	Two skiers were caught by an avalanche in backcountry, were partly buried and died.

2 March 2012	Blackwood Canyon, Ward Canyon, Sierra Nevada	An avalanche was triggered by a skier and subsequently buried him and he died.
4 March 2012	Forestdale Divide in Carson Pass area near Kirkwood, Sierra Nevada	An avalanche triggered by a snowmobiler buried and killed him and destroyed his snowmobile.
22-23 Dec 2012	Sierra Nevada	Up to 5 feet of snow in the Sierra Nevada caught several skiers and snowboarders, most of whom were able to dig out and survived, but an Alpine Meadows worker was caught and died in a ~~c~~ontrolled" avalanche released by a detonated charge and a snowboarder was buried and died in a separate avalanche event at Donner Ski Ranch a day earlier.

3.3.1.3 *Location, Severity, and Probability of Future Events*

Avalanche possibilities exist in Douglas, Elko, Clark, and Washoe Counties although there have been no written records of avalanches occurring in the more populated areas of these counties. Incline Village and Crystal Bay are under avalanche advisory several times during the winter months. The Ruby Mountains in Elko County also have this risk, but only in unpopulated areas. Care must be exercised by those snowmobiling or backcountry skiing in Ruby Mountains when accessed by Lamoille Canyon drainage (road closed in winter), as the slopes are prone to avalanches; extreme care is required. Avalanches can also occur in Clark County where avalanches on Mount Charleston in the Spring Mountains forced multiple home evacuations in December 2010.

Research done by the National Weather Service representative on our planning subcommittee indicates that climate change could have some minor effects on the frequency of avalanches in the future. Snow levels, on average, may be higher in Nevada if climate change trends continue. This could lead to greater variability in the stability of snow layers between warmer and colder winter storms, potentially triggering more avalanches.



Source: Sierra Avalanche Center, http://www.sierraavalanchecenter.org /

Figure 3-1. Map of Sierra Avalanche Center's Forecast Area

The Sierra Avalanche Center maintains a website, http://www.sierraavalanchecenter.org , with avalanche advisories for the Sierra posted by professional avalanche forecasters. This avalanche advisory is provided through a partnership between the Tahoe National Forest and the Sierra Avalanche Center. This advisory describes general avalanche conditions in the Central Sierra Nevada including both California and Nevada and applies only to backcountry areas outside established ski area boundaries (avalanche forecast area shown above in Figure 1). This website includes avalanche facts, FAQs, myths, and useful safety information as well as links to other sites:

Wherever possible, transportation corridors have been constructed to avoid avalanche hazard and are well maintained with state and local resources. When avalanches do occur, they generally affect only roads in the Tahoe basin and those that cross the Sierra Nevada.

These roads are closely monitored during periods of heavy snowfall and closed if avalanche danger threatens motorists. Active avalanche mitigation measures are employed on some transportation routes, such as NDOT's closures for avalanche control work on SR 431, the Mount Rose Hwy. These road closures may cause long delays and/or detours for motorists and truckers. Most avalanche events are located in unpopulated areas that fall under the ownership of the U.S. Forest Service where damage to current and future structures is minimal. Danger to humans increases with winter recreation in these areas such as snowmobiling, cross country skiing, and snowshoeing. By far the greatest number of past injuries due to avalanches has occurred at established ski areas where the same fresh deep snow on steep slopes that attracts skiers also initiates avalanches.

Avalanches are considered to be in the "Low Risk" hazard category because they are likely to affect few people in Nevada. The avalanches that do occur will most likely be handled efficiently by ski resorts, local authorities, the Nevada Department of Transportation, and/or the U.S. Forest Service.

Most avalanche-related injuries and fatalities will likely continue to be related to recreationalists drawn to the steep snow-covered slopes prone to avalanches and most developed ski areas have avalanche control measures and rescue teams on site to deal with avalanche-related emergencies. However, an ever-increasing number of outdoor enthusiasts are using snowmobiles in undeveloped areas with no avalanche controls or available emergency personnel. In 2009, twice as many snowmobilers died in avalanches in the U.S. as did participants in any other winter sports activities. As population increases and as more snowmobilers venture into the winter backcountry, avalanches may become an increasing threat in Nevada in the future, but currently, they do not account for a large number of deaths or injuries in this state.

Due to the location and severity of avalanche hazard, mitigation actions are relegated to the local jurisdictions where the hazards exist. The State will support local jurisdiction activities in lessening this hazard where it occurs.

3.3.2 Drought (Medium/Significant Risk)

3.3.2.1 *Nature*

According to the National Weather Service, drought is defined as a prolonged period of time during which there is an extended decline in expected precipitation over one or more seasons spread over a considerable geographical area. This differs from normal desert conditions that exist in Nevada where average annual precipitation ranges from 4 inches per year in Clark County to 12 inches in Storey County, averaging 9 inches per year statewide making it the driest state in the U.S. Severity of drought can be aggravated by other factors such as high temperature, high wind, and low relative humidity. Drought damages agriculture, tourism, fish and wildlife, water and sewer systems which in turn impacts the economic, environmental, social, and municipal structure of the state.

The National Weather Service provides a weekly drought monitor viewable by state as shown in Figure 3-2 and by region as shown in Figure 3-3 to help the public in mitigating

losses and maximizing economic gains relative to drought. Since the drought outlook changes constantly and could change significantly before this report is revised, real-time current updates for these maps are available at this link: http://droughtmonitor.unl.edu/

The site includes drought forecasts up to 12 months out from current date.

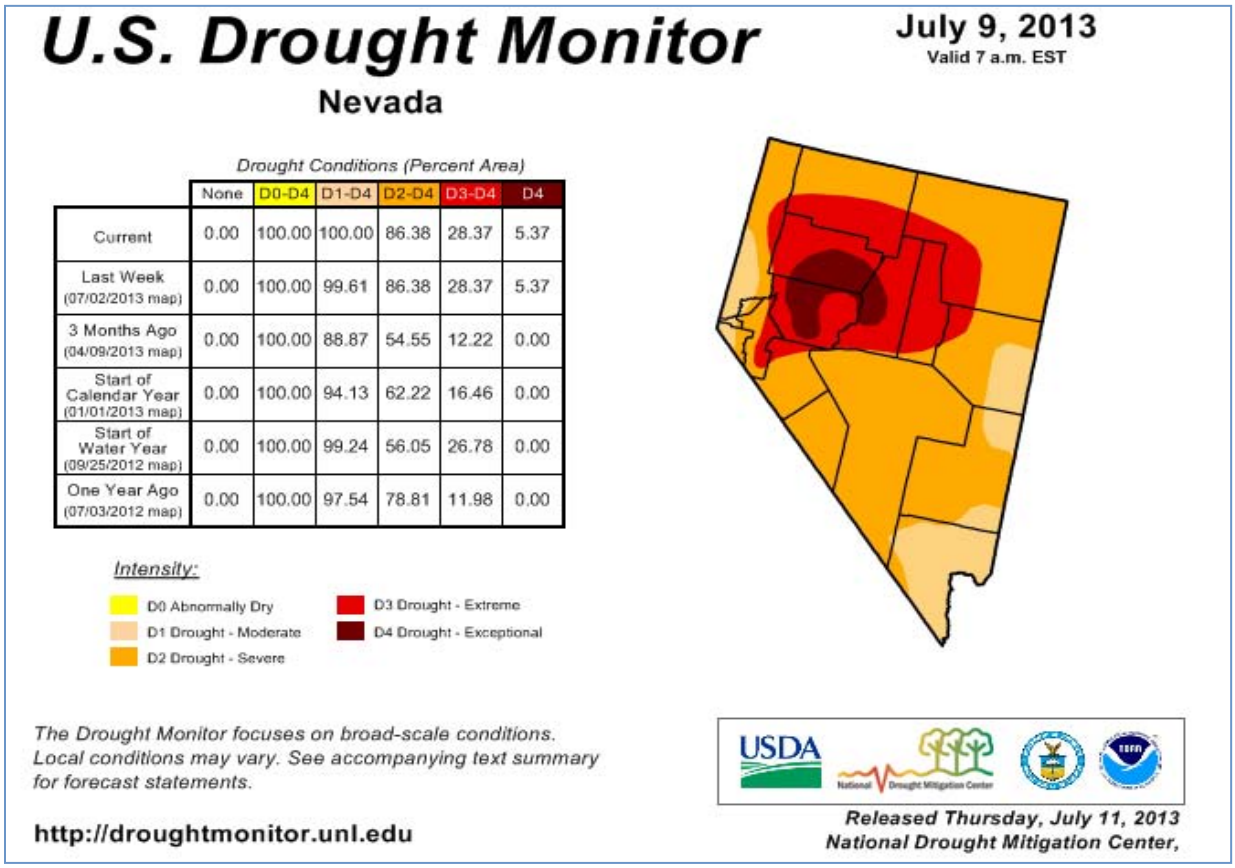


Figure 3-2. National Weather Service Weekly Drought Monitor Map for Nevada

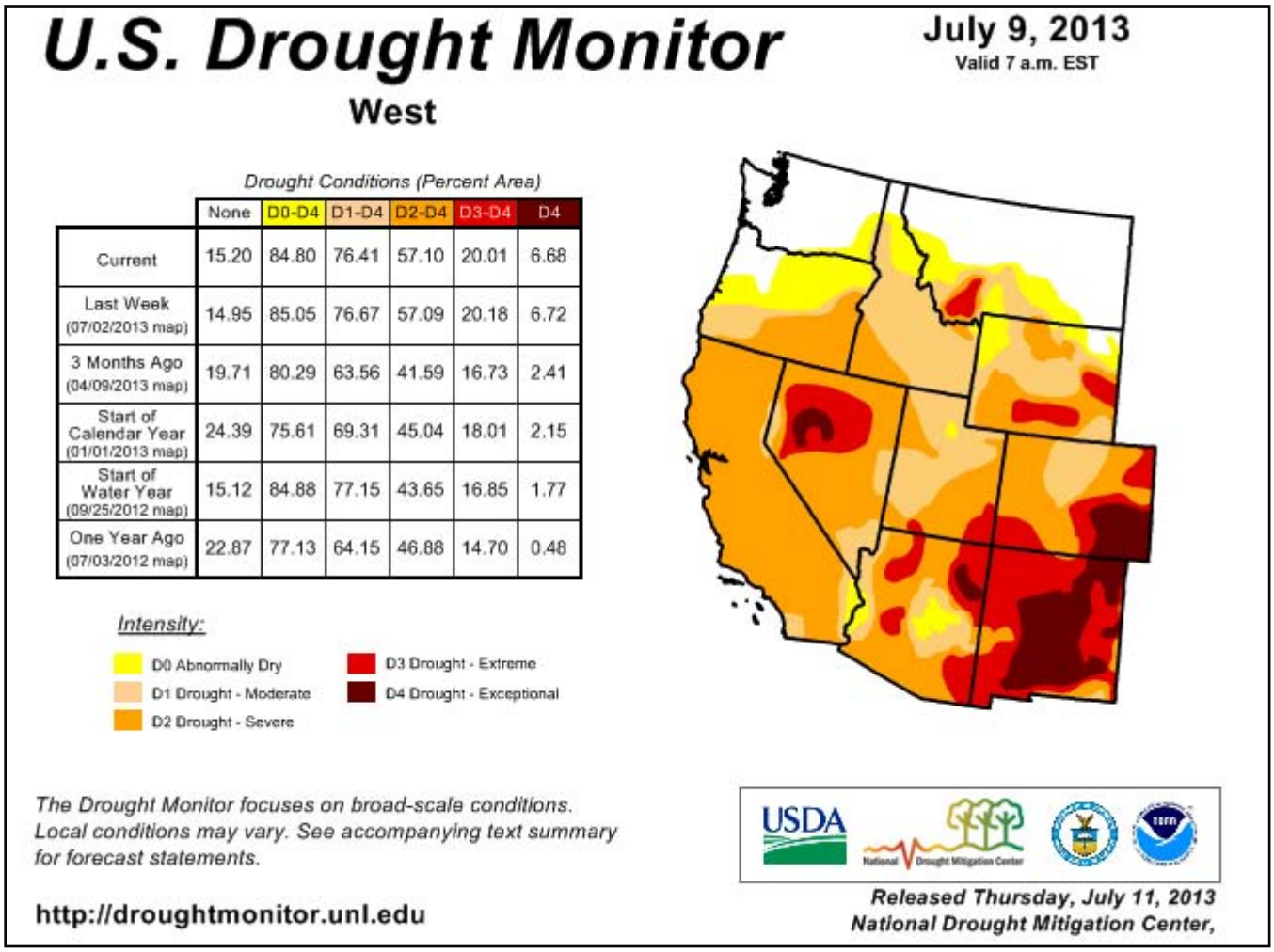


Figure 3-3. National Weather Service Weekly Drought Monitor by Region for Western U.S.

3.3.2.2 *History*

Droughts have been a major cause of economic loss and environmental damage throughout the history of the State of Nevada. Prolonged drought has caused crop failures, loss of livestock and wildlife, and shortage of potable water. Additionally, drought has caused insect infestations, dust storms, and urban-wildland interface fires.

The State Climatologist prepared historical data on drought for each county from National Climatic Data Center (NCDC) records from 1895 to 2007 that is presented in Appendix K. In a brief anecdotal summary of this history, the years 1992, 2002, and 2003 saw the most months of extreme and severe drought ratings in the northwest counties of the state as ranked by the NCDC. During the same time period, the northeastern and southern and central counties of the state all rated 1934 as by far the worst drought year in Nevada history. Clark County suffered severe to extreme drought in 1996, 1997, and 2002 as well. All the details of drought year ratings are listed in Appendix K.

By November 7 of 2012, all of Nevada's 17 counties had been designated by U.S. Department of Agriculture to be in severe drought and classified as primary natural disaster areas due to losses caused by ongoing drought. Nevadans also qualify for natural disaster benefits because their counties are contiguous. By July 2013, all of Nevada's counties still had some degree classified as Severe or higher drought, and 10 had part classified as Extreme drought conditions. Three counties had areas classified as Exceptional drought conditions.

3.3.2.3 *Location, Severity, and Probability of Future Events*

The historical data presented by the State Climatologist in Appendix K will assist each county in its preparedness and response planning. These data demonstrate the recurrence of drought in every county throughout the state and provide a basis for the probability of recurrence of drought throughout the state. The probability of a prolonged drought exists in all counties of the state of Nevada and can affect the entire state. Analysis of the data above show that in 2002 and 2004, the U.S. Department of Agriculture designated all seventeen counties in Nevada as drought affected, and by 2004, most of Nevada and much of the southwestern U. S. were in the fifth year of prolonged drought.

Drought was ranked as a ~~–M~~edium/Significant Risk" hazard to Nevada by the NHMP subcommittee.

Drought effects are mitigated through the Nevada Drought Response Plan, which defines the stages of drought in the state and outlines the state's response during a drought. The State of Nevada Drought Response Plan is administered by the Drought Response Committee chaired by the Nevada State Climatologist. The Nevada Drought Plan was first written in 1991 to address the need to know when drought conditions become severe enough to require action by the state to mitigate impact on the state's resources. The State Drought Plan was revised in 2003 and superseded by the State of Nevada Drought Response Plan in 2012. The new plan was authored by the Division of Water Resources, Division of Emergency Management and State Climate Office, and is available online at the following link:

http://water.nv.gov/programs/planning/StateDroughtResponsePlan2012.pdf

The plan establishes the system of coordination among affected stakeholders to provide assistance in mitigating the impact of drought. These include a broad cross-section of agricultural, municipal, tribal, and economic stakeholders who would be affected by drought. The plan also establishes the process for obtaining federal assistance if required.

Research done by the National Weather Service representative on our planning subcommittee indicates that climate change may be expected to lead to more frequent, longer duration and more extreme drought conditions in the future. Nevada's desert climate characterized by hot summers and low humidity may become more extreme. In addition, higher snow levels would lead to lower mountain snowpack and less spring

and summer runoff, lessening water availability for farmland, ranchland, and natural vegetation.

3.3.3 **Earthquakes** (High Risk)

3.3.3.1 *Nature*

An earthquake is sudden shaking usually caused by rapid, subsurface fault movement. This releases strain accumulated within the Earth's crust. Earthquakes are one of the largest natural hazards and have the potential to create catastrophic, comprehensive disasters. The effects of an earthquake can be damaging far beyond the site of its occurrence and usually occur without warning. After just a few seconds, earthquakes can cause massive damage and extensive casualties. The most common effect of an earthquake is ground motion, which is the vibration or shaking of the ground. Other potentially damaging effects include surface offset, landslides and rockfalls, and liquefaction, which is when the ground becomes fluidized. Virtually every populated place in Nevada is within 50 miles of an active Quaternary fault as shown on the Quaternary Fault Map of Nevada in Figure 3-4. Movement along faults not only generates energy waves causing ground motion; they can actually displace the ground by tens of meters as was done in the 1954 Fairview Peak earthquake (Figure 3-5).

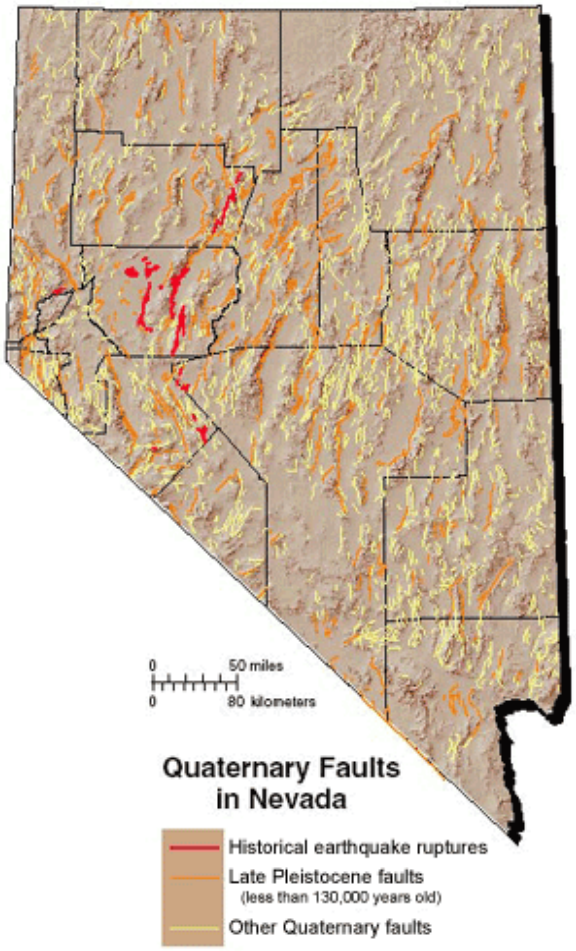


Figure 3-4. Quaternary Fault Map of Nevada. *NBMG SP-27*

Figure 3-5. Fault Scarp in the Fairview Peak Area Nevada, formed by the December 16, 1954 Earthquake. *Photograph from the National Geophysical data Center.*

The severity of ground movement generally increases with the size of an earthquake and decreases with distance from the fault or epicenter. Earthquakes cause waves in the Earth‘s interior, also known as body waves, and along the earth‘s surface, known as surface waves. There are two primary kinds of body waves. P (primary) waves are longitudinal or compressional waves similar in character to sound waves that cause back-and-forth oscillation along the direction of travel. S (secondary) waves, also known as shear waves, are slower than P waves and cause structures to vibrate from side-to-side. There are also two kinds of surface waves: Rayleigh waves, which cause a rolling motion like ocean waves and Love waves, which shake from side-to-side. Buildings and other structures must be designed to withstand the shaking from earthquakes and people must be aware of the potential threat from the contents of buildings being shaken down.

In addition to the hazard from primary ground motion, several secondary hazards can occur from earthquakes, such as surface faulting. Surface faulting is the offset of the Earth‘s surface caused by movement along a fault. Displacements along faults during a single earthquake vary both in terms of length and width, but can be significant (e.g., up to 20 feet), as can the length of the surface rupture (e.g., up to 47 miles). Surface faulting can cause severe damage to buildings, highways, railways, pipelines, and tunnels.

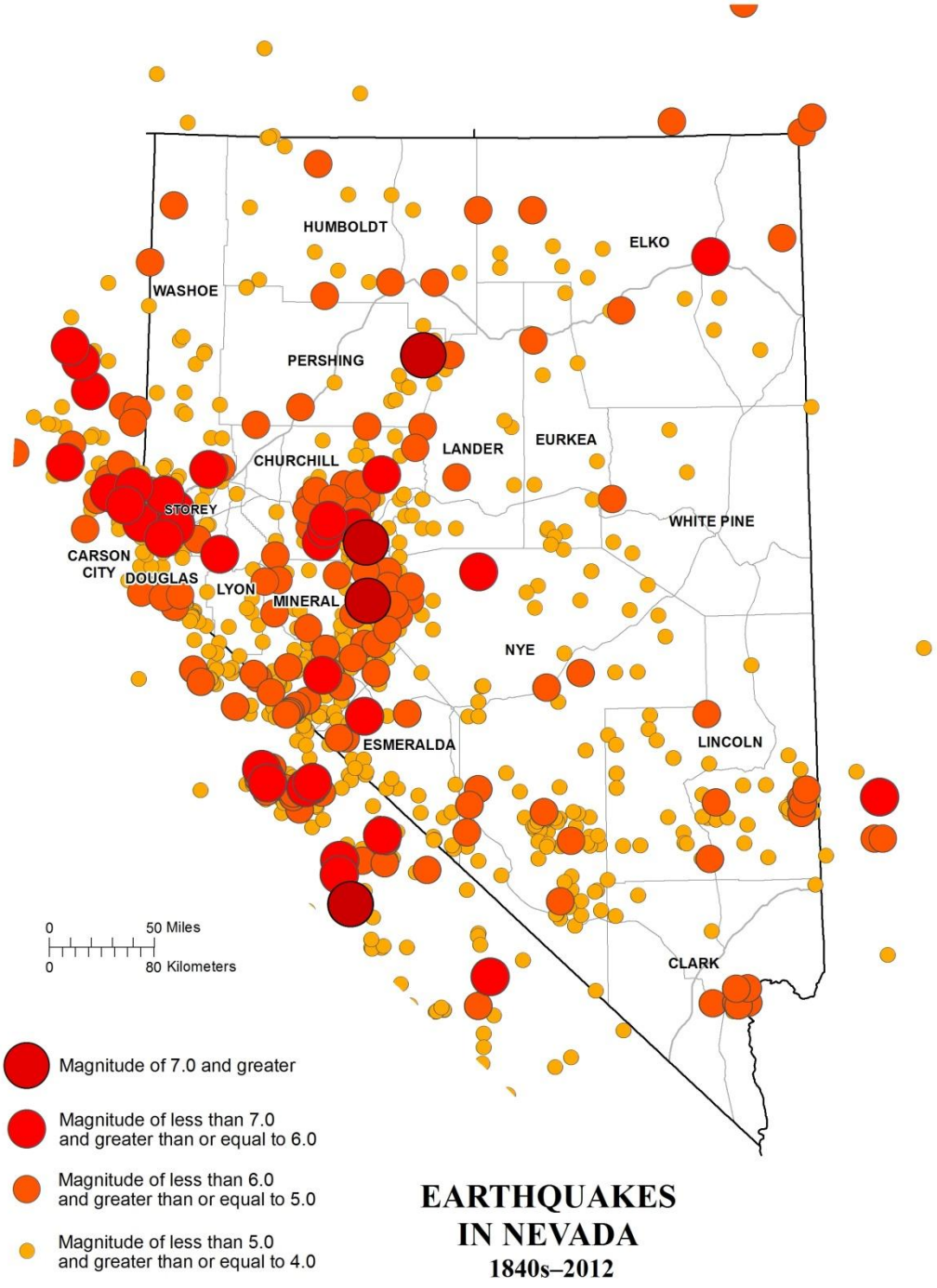
Earthquake-related ground failure due to liquefaction is another secondary hazard. Liquefaction occurs when seismic waves pass through saturated granular soil, causing the granules to collapse into the empty spaces between grains. This causes water pore pressure to increase sufficiently to make the soil behave like a fluid for a brief period. Liquefaction causes lateral spreads (horizontal movements of commonly 10 to 15 feet, but up to 100 feet), flow failures (massive flows of soil, typically hundreds of feet), and loss of bearing strength (structures sink into the ground or tip). Severe property damage due to liquefaction during an earthquake can be avoided by properly planning and designing buildings in at-risk areas.

The size of an earthquake and its effects are described using earthquake magnitude and earthquake intensity scales respectively. The size of an earthquake is measured by a magnitude scale, (usually moment-magnitude) based on how large the earthquake rupture is, and how much movement occurs across the fault. There are 10 units on the earthquake moment-magnitude scale, but it is logarithmic, meaning that there are large differences as you progress from one magnitude value to the next on the scale. For instance, the amount of shaking in a magnitude 5 earthquake would be about 10 times that of a magnitude 4 earthquake. To measure the intensity of an earthquake in a particular area, in the United States we use the Modified Mercalli Intensity (MMI) Scale. It consists of rankings of human behavior, building effects, and ground deformation in response to an earthquake using Roman numerals I-XII as described in Table 3-6.

Table 3-6. Modified Mercalli Scale	
Rank	**Description**
I	Barely felt.
II	Felt by a few sensitive people, some suspended objects may swing.
III	Slightly felt indoors as though a large truck were passing.
IV	Felt indoors by many people, most suspended objects swing, windows and dishes rattle, and standing autos rock.
V	Felt by almost everyone, sleeping people are awakened, dishes and windows break.
VI	Felt by everyone, some are frightened and run outside, some chimneys break, some furniture moves, and slight damage.
VII	Considerable damage in poorly built structures, felt by people driving, most are frightened and run outside.
VIII	Slight damage to well-built structures, poorly built structures are heavily damaged.
IX	Underground pipes breaks, foundations of buildings are damaged and buildings shift off foundations, considerable damage to well-built structures.
X	Few structures survive, most foundations destroyed, water moved out of riverbanks and lakes, avalanches and rockslides, railroads rails are bent.
XI	Few structures remain standing, total panic, large cracks in the ground.
XII	Total destruction, objects thrown into the air, the land appears to be liquid and is visibly rolling like waves.

3.3.3.2 *History*

The State of Nevada ranks in the top three states subject to the largest earthquakes over the last 150 years. Only Alaska and California have had more large (magnitude 7 or greater) earthquakes. Figure 3-6 shows a map of earthquake locations in Nevada and adjacent parts of California from the 1840s to 2012. Table 3-7 is a partial listing of significant historical earthquakes in Nevada from 1860 to 2008 with magnitudes of 5.0 or greater. Geologically young faults, located in all parts of Nevada (Figures 3-4 and 3-8), are the sources of earthquakes.



Earthquakes in the Nevada region recorded from the1840s to 2012. (Nevada Seismological Laboratory)

Figure 3-6. Significant Earthquakes in Nevada and Adjacent California, 1840s-2012

Table 3-7. Significant Historical Earthquakes in Nevada from the 1840s to 2008			
Date	**Magnitude**	**Location**	**Nearest Community[1]**
1840s	7+ (?)	Western Nevada	Winnemucca area
Mar. 15, 1860	6.8	Western Nevada	Virginia City
Dec. 27, 1869	6.7	Virginia Range	Virginia City
Dec. 27, 1869	6.1	Virginia Range	Virginia City
Jun. 3, 1887	6.3	Carson City	Carson City
Apr. 24, 1914	6.4	Reno area	Reno
Oct. 3, 1915	7.3	Pleasant Valley	Winnemucca
Dec. 21, 1932	7.1	Cedar Mountain	Gabbs
Jan. 30, 1934	6.3	Excelsior Mountains.	Mina
Dec. 29, 1948	6.0	Verdi area	Verdi
May 24, 1952	5.0	Lake Mead area	Boulder City
Jul. 7, 1954	6.6	Rainbow Mtn.	Fallon
Aug. 8, 1954	7.0	Rainbow Mtn.	Fallon
Dec. 16, 1954	7.2	Fairview Peak	Fallon
Dec. 16, 1954	7.1	Dixie Valley	Fallon
Sep. 22, 1966	6.0	Clover Mountain	Caliente
Sep. 12, 1994	5.9	Double Spring Flat	Gardnerville
Feb. 21, 2008	6.0	Town Creek Flat	Wells
May 25, 2008	5.0	Mogul	Mogul
1 Not necessarily the only communities affected by the earthquake. *Source: Diane de Polo, UNR Seismological Laboratory*			

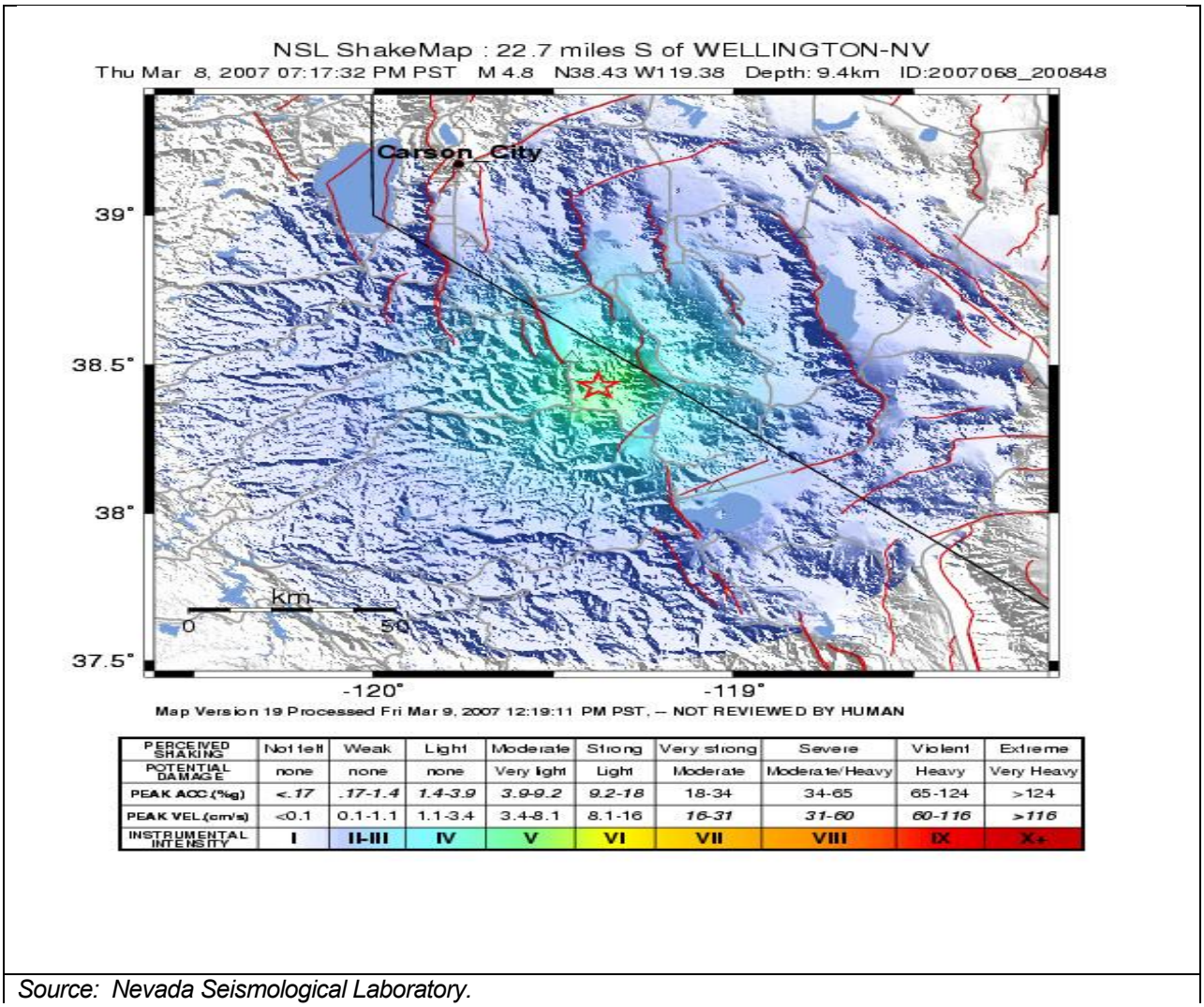
There is no doubt that Nevada is in earthquake country. Historically, there has been a magnitude 7 or greater earthquake about every 30 years somewhere in Nevada; the last one was in 1954, over 50 years ago. Table 3-8 presents some earthquakes that have occurred in Nevada in the last decade, many near populated areas.

Table 3-8. Nevada Earthquakes in the Last Decade		
County, Location	**Date; time**	**Magnitude; description; damage**
Douglas County; Near Minden-Gardnerville, NV	23 June 2000 11:00 AM PDT	M=3.6; preceded by another event of M = 3.3 at 6:55 AM. Due to its relatively small size, no damage was reported.
Douglas County; 2 miles southeast of Topaz Lake and ~16 miles SW of Wellington, Nevada.	26 September 2000 12:10 PM PDT	M=4.7; Depth about 9 km (6 mi). Many foreshocks were recorded for hours prior to this earthquake, including one M = 3.0 a few seconds prior to the main event. Numerous aftershocks recorded. This event occurred in a moderately active seismic zone which has had at least 3 nearby (<10 km) earthquakes in the last decade of M > 4. No damage reported.
Washoe County 10 mi. S. of Gerlach, NV	16 November 2000 2:00 PM PDT	M=3.8; Depth about 3 km (2 mi). This event occurred in a small area that had 12 earthquakes >

Table 3-8. Nevada Earthquakes in the Last Decade		
County, Location	**Date; time**	**Magnitude; description; damage**
		M 2 and 2 earthquakes > M 3 since October 5 of this year. No damage reported.
Washoe County 12 mi. S. of Gerlach, NV	19 November 2000 6:30 PM PDT	M=4.3; about 5 km (3 mi) depth. No damage reported.
Washoe County, about 4 miles N. of Kingvale exit on I-80, or about 15 miles WNW of Truckee	2 December 2000 11:00 AM PDT	M=4.9; depth about 12 km (5 mi). There was a sequence of small aftershocks. No damage reported.
Washoe County, 5 miles N of Graeagle, CA and 41 miles S of Susanville, CA.	10 August 2001 2:00 PM PDT	M=5.4. Widely felt throughout eastern California and western Nevada. A number of aftershocks were recorded. This region has experienced smaller events of a similar character in the past few years. Minor damage and/or injury would be expected for an event of this size.
Elko County, about 50 km (30 mi) N. of Elko, NV	October 2001 10:37 PM PDT	M=4.6. It was felt by many in the Elko area but no damage was reported.
Nye County, ~12 miles SE of Yucca Mountain and just E of Hwy 395 between Indian Springs and Beatty, NV.	14 June 2002 9:30 AM PDT	M=4.4. This earthquake occurred in the aftershock zone of the M5.6 Little Skull Mountain earthquake of June 29, 1992. The area has been active since that earthquake, but this was the largest event in over 6 years. No damage reported.
Washoe County, located near the intersection of Pyramid Hwy with I-80 in Sparks, NV	19 July 2002 9:30 AM PDT	M=2.4.This earthquake, although very small in magnitude, was apparently felt by several people in Sparks. No damage reported.
Churchill County Storey County, about 7 mi SE of Fernley NV.	21 October 2002 4:00 PM PDT	M=3.5. This earthquake was felt in the Fallon and Fernley areas. No reports of damage or injury.
Churchill County, about 4 miles SE of Silver Springs, NV	21 November 2002 9:00 AM PST	M=3.5 with a preliminary depth of 13 kilometers (~ 8 mi). No damage reported.
Mineral County, in a remote area in the S part of the Monte Cristo Range, about 14 miles SE of Mina, NV	29 May 2003 5:00 PM PDT	M=4.0. This event was preceded by an M 3.7 earthquake at 11:33 AM PDT at approximately the same location and also by some other smaller, intervening shocks. No damage reported.
Douglas County, about 9 miles SE of Boulder City, NV	17 September 2003 12:30 PM PDT	M=2.7; depth about 3.6 km (2 miles); No damage reported.
Washoe County, approximately under the Reno International Airport. Reno, NV	April 10, 2004 3:00 PM PDT	M=2.4; depth about 8.6 kilometers (~ 5 miles); The earthquake was felt by many residents of Reno/Sparks. No damage reported.

Table 3-8. Nevada Earthquakes in the Last Decade		
County, Location	**Date; time**	**Magnitude; description; damage**
Washoe County, 6 mi. N. of Kings Beach on N shore of Lake Tahoe, nearly on the NV-CA state line, NV	June 3, 2004 9:00AM PDT	M = 4.5; depth about 8.6 kilometers (~ 5 miles). There were five minor foreshocks, with the largest M 2.7 foreshock at 1:25 AM and many aftershocks. The earthquake was felt as light to weak shaking throughout the Reno and Lake Tahoe region. No damage reported.
Esmeralda County, about 30 miles S of Hawthorne, NV and 30 miles NW of Mammoth Lakes, CA	20 September 2004 11:00 AM PDT	M = 5.0; depth about 5.5 kilometers (~3 miles).Followed two larger events on September 18, at 4:02 and 4:43 PM PDT; whose magnitudes were 5.5 and 5.4, respectively. All three events were located within roughly 3 km (~2 miles) of one another. Numerous aftershocks (nearly 1000) were observed at the Nevada Seismological Laboratory. No damage reported.
Washoe County, about 5 miles N of downtown Reno, NV in the Sun Valley area.	27 December 2004 12:00 PM PST	M = 2.5; depth about 3.4 km (~2 miles); This was the largest of a swarm of over 100 micro-earthquakes in this area and was reported to be felt by at least three people. No damage reported.
Washoe County, about 8 miles E of Truckee, California, close to the NV–CA state line and Lake Tahoe	26 June 2005 12:50 PM PDT	M = 5.0; depth about 13.2 kilometers (~ 6.6 miles) This earthquake occurred in the same area where a M 4.5 earthquake was recorded on June 3, 2004. Felt widely throughout the Reno and Lake Tahoe region but no damage was reported.
Douglas County, 22.7 miles S of Wellington, NV.	8 March 2007 19:17:32 PST	M = 4.8; The shake map for this event is in Figure 3-7. No damage was reported.
Elko County, NV; Wells area; epicenter located about 5.5 miles (9 km) NE of the town of Wells, NV	21 February 2008 6:16 am PST	M = 6.0; There were at least three quake-related injuries, and extensive damage to unreinforced masonry buildings in and around the town of Wells. There were several propane leaks and widespread non-structural damage caused by the quake.
Washoe County, Mogul-Somersett, densely populated residential suburb of NW Reno, Washoe County, NV	25 April 2008 11:38 PM PST	M = 5.0; located in densely populated residential suburb of northwest Reno, Nevada. It caused approximately $2 million in damage.
Mineral County, NV; near Hawthorne	April13, 2011 to May 28	Eight or more earthquakes of magnitude 3.5 to 4.4 were centered about 9-14 miles east to SE of Hawthorne NV; no reports of injuries or damage.
22 miles ESE of Yerington	Oct 1, 2011	M4.1 earthquake centered 22 miles ESE of Yerington
NNW of Incline Village	June 22 2012	M4.0 earthquake centered 4.5 Miles NNW of Incline Village

Table 3-8. Nevada Earthquakes in the Last Decade		
County, Location	**Date; time**	**Magnitude; description; damage**
12.7 mi NW of Fernley	Oct 3, 2012	M 3.77 earthquake centered 12.7 mi NW of Fernley



Source: Nevada Seismological Laboratory.

Figure 3-7. NSL Shake Map for 22.7 Miles South of Wellington Nevada

3.3.3.3 *Location, Severity, and Probability of Future Events*

In Nevada, faults occur along many of the range fronts, within ranges, and within valleys. Normal-slip faults, those that down-drop the ground during earthquakes, commonly appear as steps in the landscape related to the vertical offset, whereas strike-slip faults, that offset the ground sideways, usually are expressed by linear features, such as elongate valleys, and alignments of features, such as springs. Historical earthquakes have ruptured both kinds of faults in Nevada.

In the *Hazard Mitigation Survey* and the *County Hazard Mitigation Plans,* Eureka and Clark Counties considered this risk as low. Eureka considered the county's water and sewer lines could be at risk in case of an earthquake. Clark County cited Yucca Mountain as a problem in case of an earthquake. Carson City considered this risk high citing problems with collapsing buildings after an earthquake. Also, Churchill, Douglas, Lincoln, Nye, Story and Washoe Counties considered this risk to be high. Douglas County has some of the most active faults in Nevada. Lincoln County has many known faults, although the hazard appears to be lower in this county than in most counties in Nevada. Nye County has had two major earthquakes and several minor earthquakes. Washoe County was concerned with residential and commercial structural damage, transportation loss due to major highways through the county, and utility damage.

In the *Tribal Hazard Mitigation Survey,* Ely Shoshone Tribe, Shoshone-Paiute Tribes of Duck Valley, and South Fork Band Council considered this hazard as low risk. Shoshone-Paiute Tribes of Duck Valley mentioned that there are eighteen identified fault lines on the Duck Valley Indian Reservation. The Confederated Tribes of Goshute Reservation identified this hazard as a probability of moderate. All of the tribes that answered this survey mentioned that structural damage to residential buildings would be a major problem with this hazard.

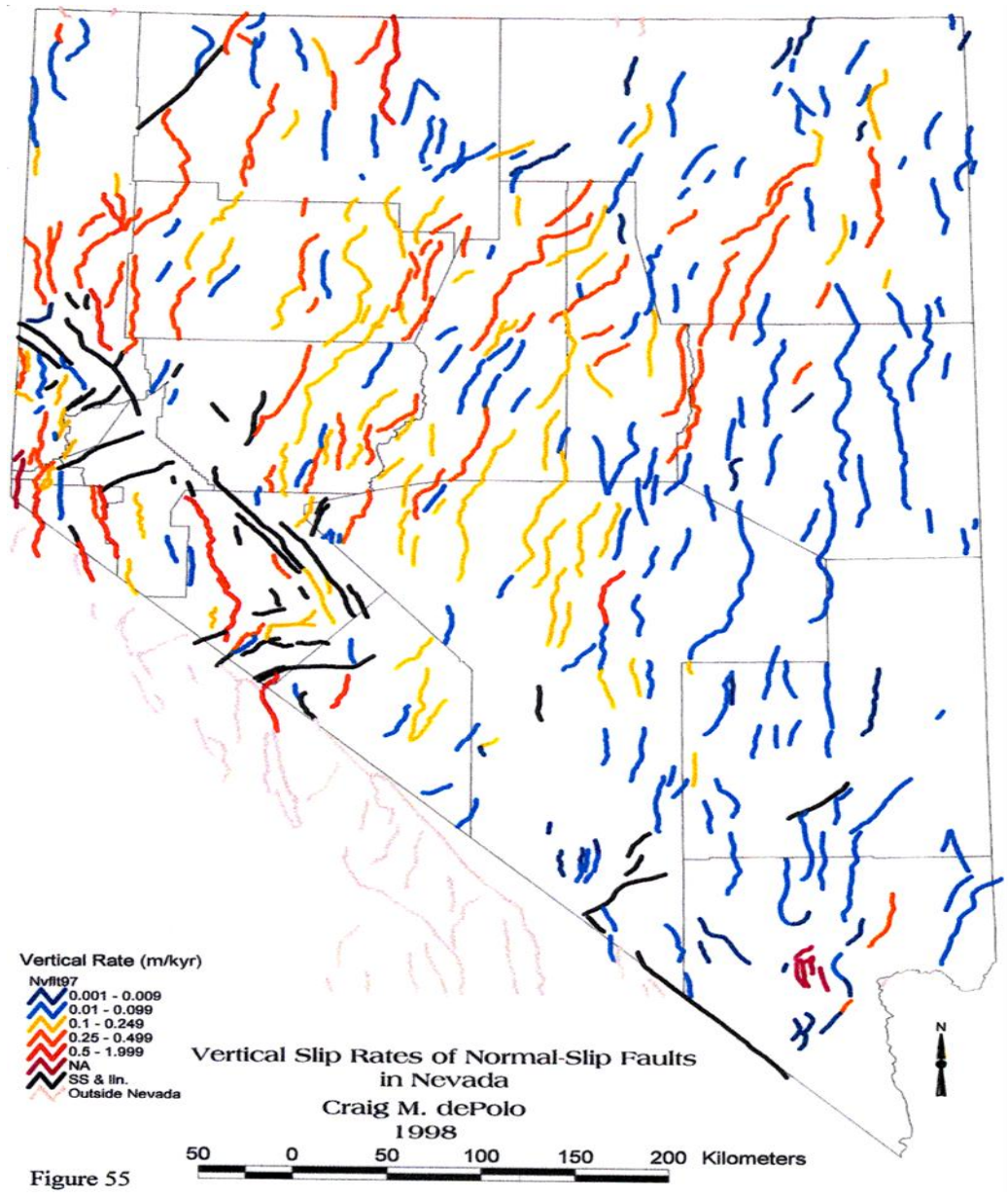
According to the Nevada Seismological Laboratory and Nevada Bureau of Mines and Geology, Nevada has recently active Quaternary faults (Figure 3-9) that are the sources of earthquakes located throughout the state, so an earthquake could occur at any time in any part of the state. Considerable information about earthquake hazards is available online through the Nevada Bureau of Mines and Geology (http://www.nbmg.unr.edu/), the Nevada Seismological Laboratory (http://www.seismo.unr.edu), the University of Nevada, Las Vegas (http://earthquakes.unlv.edu/outreach/), and the U.S. Geological Survey (http://earthquake.usgs.gov/). The Nevada Bureau of Mines and Geology (NBMG) has two maps that help define the location, severity, and probability of earthquakes in the state. NBMG Map 167, *Quaternary Faults in Nevada,* is available in pdf format or as an online, interactive map that allows the user to locate faults near a given address and on topographic maps and aerial photographs. Links:

http://www.nbmg.unr.edu/dox/m167.pdf (see Figure 3-9) and
http://www.nbmg.unr.edu/dox/of099.pdf (see Figure 3-4)

Table 3-9 contains a list of some of the major active faults in Nevada.

Table 3-9. Some Major Active Faults in Nevada				
Fault	**Potential Earthquake Magnitude**	**Length in Miles (km)**	**Slip Rate in Millimeters Per Year***	**Average Time Between Earthquakes (years)****
Genoa fault	7.4	47 (75)	1 - 3	1,500 - 4,000
Pyramid Lake fault zone	7.3	47 (75)	0.4 - 1.1	1,500 - 4,000
Carson City fault	6.8	9 (14)	0.4 – 1	1,500 - 8,000
Dixie Valley fault zone	7.1	60 (96)	0.3 - 0.6	6,000 - 12,000
Mt. Rose fault zone	7.1	25 (40)	0.2 - 0.4	2,000 - 10,000
Toiyabe Range fault zone	7.3	69 (110)	0.1 - 0.8	2,000 - 15,000
Ruby Mountains fault zone	7.2	62 (99)	0.05 - 0.3	10,000 - 100,000
Black Hills fault	6.8	17 (27)	0.05 - 0.2	5,000 - 20,000
Steptoe Valley fault zone	7.2	87 (139)	0.04 - 0.1	18,000 - 45,000
Frenchman Mountain fault zone	6.8	16 (26)	0.02 - 0.2	5,000 - 50,000

**Scientists usually use metric values, particularly millimeters per year, for slip rates of faults. To convert to inches per year, multiply by 0.039.*
***Because we lack detailed studies, these values are approximations that cover wide ranges of potential values. Source: Living with Earthquakes in Nevada, NBMG Special Publication 27.*



Source: NV Bureau of Mines & Geology

Figure 3-8. Vertical Slip Rates of Normal-Slip Faults in Nevada

As seen in Table 3-9, there is a direct correlation between slip rate and frequency of earthquakes along faults. The normal faults with the highest slip rates have the warmer colors (red, orange, yellow) on the map shown in Figure 3-8 above. Unfortunately, many areas of the state have not yet been mapped, so many faults and their slip rates are unknown. Another indicator of future earthquakes is recent past earthquake activity on

faults. Figure 3-9 below shows recent rupture history on Quaternary faults in Nevada and adjacent areas. Table 3-41 in Section 3.7.1 shows the probabilities of major earthquakes occurring within 50 years within 31 miles of 38 major Nevada communities. The U.S. Geological Survey is the source of these data which are accessible at this link: http://eqint.cr.usgs.gov/eqprob/2002/index.php. The shaking potential map for Nevada is also found in Section 3.7.1, Figure 3-41.

Number of Years Before Present (YBP) Since Latest Fault Rupture

Red: <150 YBP Orange: <15,000 YBP Yellow: <30,000 YPB

Green:<750,000 YBP Purple: <1,800,000 YBP

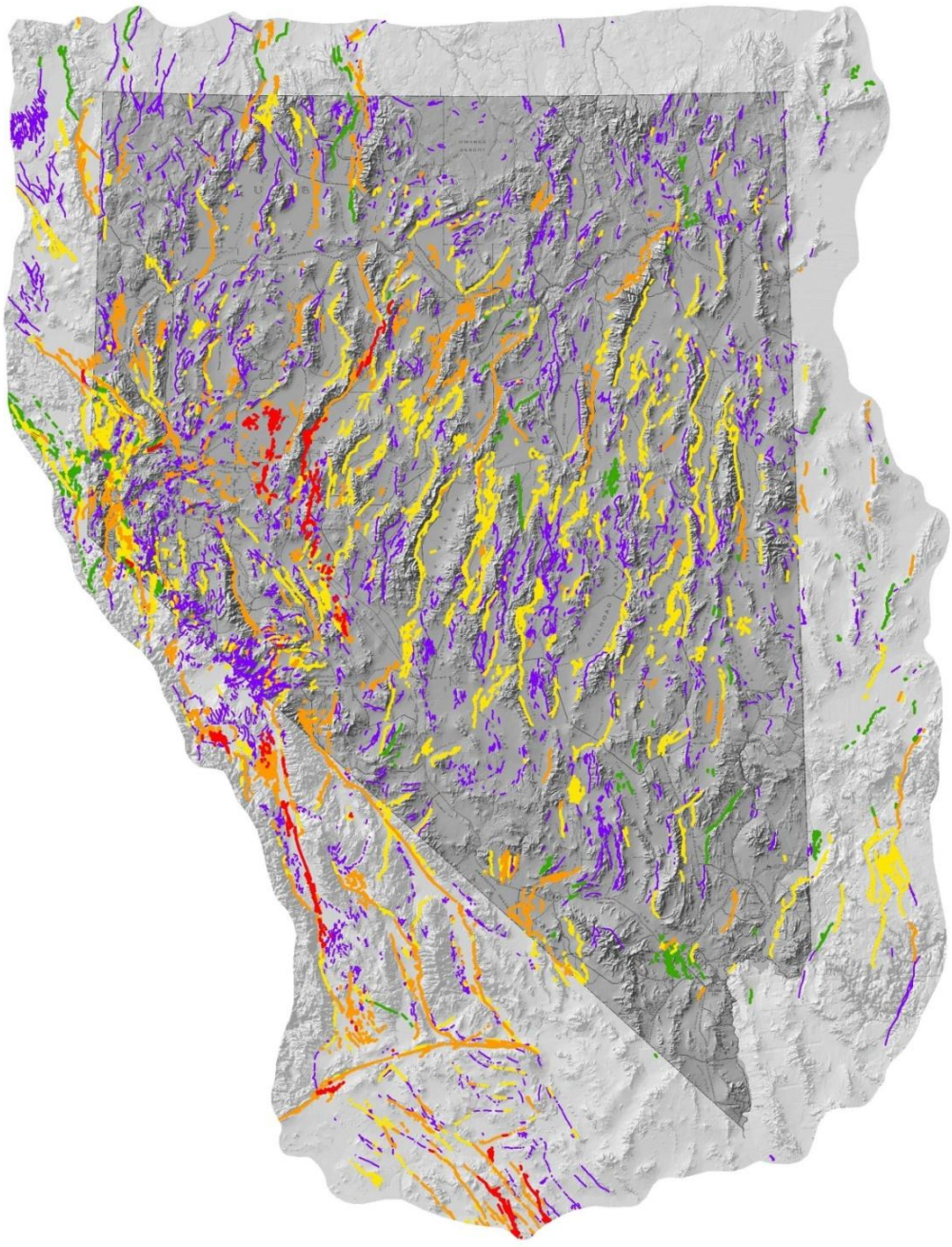


Figure 3-9. Map of Quaternary Fault Movement in Nevada

3.3.4 Epidemic (Low Risk)

3.3.4.1 *Nature*

An infectious disease that occurs in greater than normal numbers in several communities or that crosses geographical boundaries is considered an epidemic. The same infectious disease that spreads from country to country is considered a pandemic. Although most microbes that live in our environment perform functions essential to our survival, a small percentage of those that enter our bodies cause an infectious disease. Infectious diseases emerge, suddenly or gradually, in various environments, and may spread across a region or even the world. Infections that occur in greater than normal numbers in a single location such as a hospital, hotel or neighborhood could be considered an outbreak.

Epidemics have occurred throughout human history and in some cases have influenced history. The last pandemic occurred in 2009-2010 with the emergence of the novel H1N1 Type A Influenza. Although this pandemic was less virulent than previous pandemics, H1N1 caused millions more infections than the normal seasonal flu, many deaths and had a significant impact on the global economy. A more virulent form of influenza such as H5N1 Avian Influenza could have catastrophic results. Infectious disease has the potential to affect more people and create more economic harm than any natural disaster or terrorist act. "The most menacing bioterrorist is Mother Nature," says veteran science journalist Madeline Drexler.

Although epidemics and outbreaks of disease have traditionally been associated with disease caused by infectious agents, in the second half of the 20th century the term epidemic has also become associated with non-infectious disease such as obesity and diabetes, or disease caused by lifestyle and environmental factors such as smoking-related heart disease and cancer clusters. In this plan, we will address only epidemic disease caused by infectious agents.

The impact of outbreaks of pathogens on communities differs depending upon the disease, the population of the community, the age of the primary targets, socio-economic situation of the community affected and the public health response capabilities of the affected community. For example, 100 cases of meningitis across Las Vegas may be a concern, but 10 cases of the same meningitis may close the entire school system in Fallon. Four deaths from an infectious disease may not stretch public health resources in Reno, but may create an emergency in Yerington.

Disease outbreaks and epidemics are not confined to human populations. Diseases such as hoof-and-mouth disease and mad cow disease, if introduced into the livestock population, could decimate the beef industry for decades. In the past, global pandemics involving avian influenza and birds have occurred and there is currently a global influenza pandemic affecting birds. The H5N1 avian influenza virus infects mainly wild birds, but can also infect poultry. This virus has been known to transmit infection from chickens to humans with deadly results. Finding H5N1 in a domestic bird population could result in the culling of a state's entire population of poultry in an attempt to isolate the virus from transmission into the human population.

Pandemic influenza and other emerging epidemic diseases present a major threat to life, economies and security in an increasingly globalized world. The impact of disease

epidemics has increased dramatically as the world becomes ever more interconnected. Airlines now carry an estimated 1.6 billion passengers every year. Trade, commerce and financial markets are increasingly interrelated. In 2009, Mexico reported an outbreak of a novel strain of influenza which had not been previously recorded in human circulation. Because there was little immunity to this strain of influenza, and because of modern routes of travel and transmission, it became a global pandemic within 4 months.

Some challenges presented by epidemics:

- Epidemics associated with emerging and re-emerging infectious diseases are now occurring in historically unprecedented numbers. Since 2001, the World Health Organization (WHO) has verified more than 1100 epidemics of international importance.
- Over 70% of new and emerging diseases originate in animals. This requires improved cooperation between animal and human health sectors at the national and international level, especially in the areas of detection, risk assessment and risk reduction.
- National public health systems are weak in many areas and are further stressed by poverty and political instability. The lack of disease surveillance and response capacity in one part of the world is a threat to all. Investment in strong national alert and response systems is a vital investment in global health security.

The Centers for Disease Control and Prevention (CDC) have listed 83 reportable diseases that have the potential to be the next human epidemics. For a full listing, go to the CDC website: http://www.cdc.gov/ncphi/disss/nndss/PHS/infdis2010.htm

The Nevada Department of Agriculture has listed 97 reportable diseases that have the potential to be the next animal epidemics. For a full listing go to their website: http://agri.nv.gov/Animal2_Reportable_Diseases.htm

Some recent emerging and re-emerging infectious diseases globally are shown on the map in Figure 3-10 below.

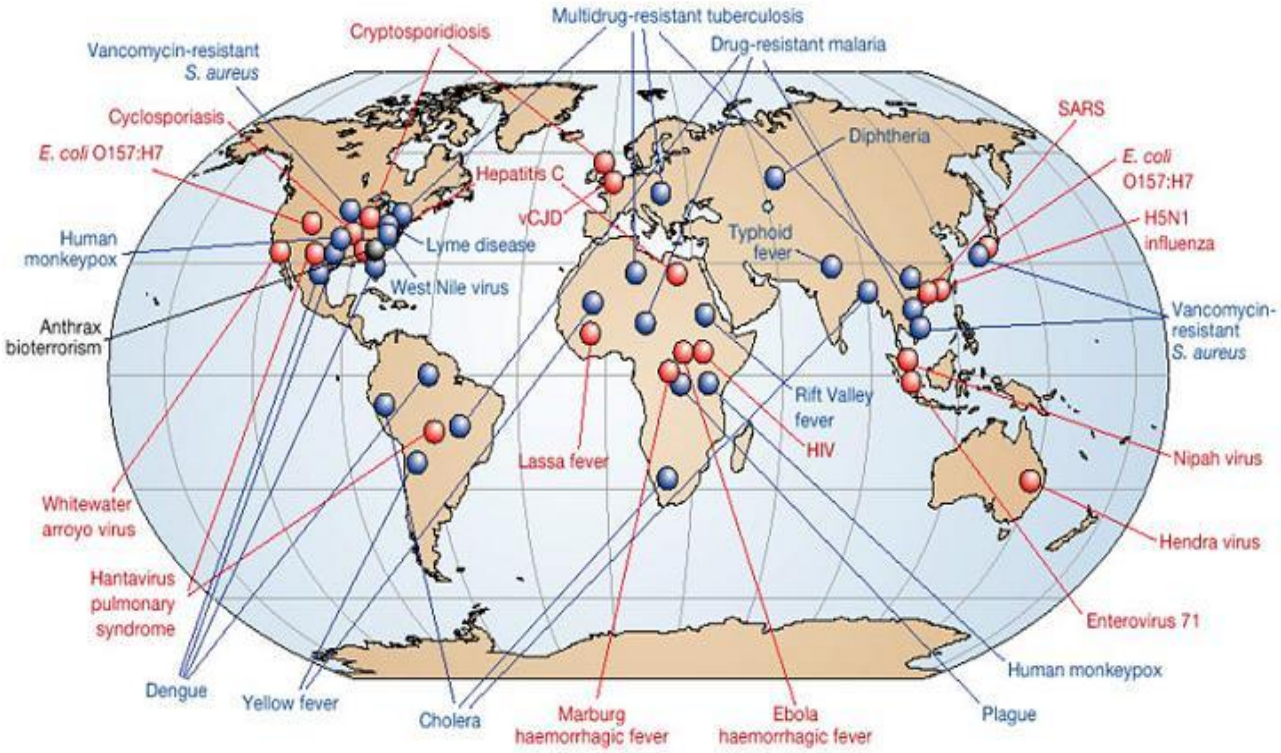


Figure 3-10. WHO Emerging & Re-Emerging Infectious Diseases.

Nature, 2013

In Nevada, we have seen occurrences of anthrax, whooping cough, and measles. Some of our rodents carry the plague bacteria and the Hantavirus pathogen. In 2009-1010, the H1N1 influenza affected the population in each county and strained our public health capacity. Unless there is significant immunity built up for emerging or re-emerging diseases, any population can be vulnerable.

3.3.4.2 *History*

Table 3-10 below presents 20th Century incidences of pandemics, epidemics, and major infectious disease affecting people in the U.S.

Table 3-10. 20th Century U.S. Pandemics and Epidemic Occurrences

Date	Details
1918-1919	The influenza pandemic of 1918 and 1919, known as the **Spanish Flu or Swine Flu**, had the highest mortality rate in recent history for an infectious disease. More than 20 million persons were killed worldwide, some 500,000 of which were in the U.S. alone (CDC, October 1998).
1916, 1949	**Polio epidemics** prior to the advent of the polio vaccine killed over 7,000 people in 1916 and over 3,000 in 1949.

1957, 1968	In the 20th century the world also experienced **influenza pandemics** in 1957 and 1968, which although were less virulent than the 1918 Spanish Flu, caused millions to be infected and many deaths.
1999, 2002	**West Nile Virus (WNV)**, a seasonal infection transmitted by mosquitoes, caused an epidemic which grew from an initial U.S. outbreak of 62 disease cases in 1999 to 4,156 reported cases, including 284 deaths, in 2002 (CDC, July 8, 2003).
1980 – 2000	Physicians began seeing immunodeficiency disorders in gay men. This was the beginning of the **AIDS** pandemic. In twenty years AIDS claimed over 40 million people worldwide.
2003	**Severe acute respiratory syndrome (SARS**) was estimated to have killed 915 and infected 8,422 worldwide by mid-August 2003 (Word Health Organization, August 15, 2003). In the U.S., there were 175 suspect cases and 36 probably cases, although no reported deaths (CDC, July 17, 2003).
2003-present	Although most cases go unrecognized, **Norovirus** is believed to affect over 20 million people in the U.S. each year. Norovirus accounts for 96 percent of all non-bacterial outbreaks of gastroenteritis (Arizona Department of Health Services, March/April 2003).
2009 – 2010	In April of 2009, **novel H1N1 influenza** virus started to circulate in Mexico. It soon spread to the United States and within 2 months of its first isolation the virus became a global pandemic.

Table 3-11 below presents recent occurrences and outbreaks of infectious of major infectious disease affecting people in Nevada.

Table 3-11. Recent Historical Occurrences or Outbreaks in Nevada

Date	Details
February 1992	**Cholera** outbreak confirmed. At least 26 passengers from Aerolineas Argentinas Flight 386 that brought a cholera outbreak to Los Angeles traveled on to Las Vegas, where 10 showed symptoms of the disease. Cholera or cholera-like symptoms developed in 67 passengers of Flight 386.
Spring 2000	Five cases of the **measles** confirmed. Outbreak identified and confirmed, Clark County Health District (CCHD) Office of Epidemiology (OOE) worked with the Immunization Clinic and the media to alert the community about preventing the spread of the disease.
Octr 2004	**Norovirus** confirmed at a major public accommodation facility on the Strip in Las Vegas.
2004	During October 13-19, a total of 200 cases of human **West Nile Virus** were reported in 20 states, which included Nevada. During 2004, 40 states including Nevada reported a total of 2,151 cases of human West Nile Virus.
Fall 2004	**Chickenpox** (varicella) outbreak in Clark County, Nevada elementary school. 32 students from all grades were infected.
April 2006	**Norovirus** outbreak at a Reno, Nevada daycare, Noah's Ark. 30 Norovirus cases were confirmed. 2 additional people were infected after the daycare had been cleaned and sanitized.
March 2007	A **norovirus** outbreak in Las Vegas, Nevada sickened at least 215 inmates and 41 staff members at the Clark County Detention Center. Most of those sickened complained of

Table 3-11. Recent Historical Occurrences or Outbreaks in Nevada	
Date	**Details**
	stomach-related distress such as diarrhea, vomiting and cramps. None were hospitalized.
2009 - 2012	The **novel H1N1** influenza virus became a global pandemic and in Nevada thousands of people were infected leading to 40 deaths.

3.3.4.3 *Location, Extent, and Probability of Future Events*

The past history of outbreaks and the 2009–2012 H1N1 influenza pandemic have shown us that the state is vulnerable to emerging disease epidemics. The nature of jet travel has brought an unprecedented mode of disease transmission from an affected area to any other country in the world. The existence of Las Vegas and Reno as major world-class vacation destinations provides the potential for an influx of epidemic-causing pathogens from other countries. The Subcommittee ranked epidemic as a ~~l~~ow risk" hazard in Nevada.

In Nevada, the Nevada State Health Division (NSHD) and Local Health Authorities (LHAs) have surveillance systems in place, in cooperation with CDC to actively test for communicable diseases. Local sentinel providers send specimens to the Nevada State Health Laboratories and are required to report findings to NSHD. Epidemiologists track symptoms and diseases to determine if outbreaks are occurring and if mitigation practices need to be employed.

Public health professionals have many ways to keep communicable diseases from becoming epidemics. Required immunizations are the most effective way to protect a community from some infectious diseases. Other ways include public information, personal hygiene, social distancing and in certain cases, isolation and quarantine measures are employed.

For animal disease mitigation, immunizations and disease screening are used to protect domesticated animals. A large majority of the animals imported into the state of Nevada are required at a minimum to have an examination performed by a licensed veterinarian and a health certificate issued to further aid in animal disease mitigation (pasture to pasture movements are excluded).

If a disease outbreak is present in a localized herd, quarantines, movement restrictions, and possibly culling are options that may be utilized to prevent spread of disease.

3.3.5 **Expansive Soils** (Low Risk)

3.3.5.1 *Nature*

Soils and soft rock that tend to swell or shrink due to changes in moisture content are commonly known as expansive soils. Changes in soil volume present a hazard primarily to structures built on top of expansive soils. The most extensive damage occurs to highways and streets.

In the United States, two major groups of rocks serve as parent materials of expansive soils; they occur more commonly in the West than in the East. The first group consists of ash, glass, and other rocks of volcanic origin. Glass and aluminosilicate minerals in these volcanic materials often decompose to form expansive clay minerals (most commonly smectite, a group of clay minerals that incorporate water in their crystal structures). The second group consists of sedimentary rock containing clay minerals, examples of which are the shales of the semiarid west-central states. Because clay materials are most susceptible to swelling and shrinking, expansive soils are often referred to as swelling clays. Expansive soils also include soils with sodium sulfate, which occur in Las Vegas Valley. Also related to expansive soils are collapsible soils, such as the soils in Las Vegas Valley that contain gypsum (hydrated calcium sulfate).

Expansive soils can be recognized by visual inspection in the field. Shales, claystones, weathered volcanic rocks, and residual soils containing smectite often have a characteristic ~~-~~popcorn" texture, especially in semi-arid areas.

Most engineering problems caused by swelling clays involve soils underneath areas covered by buildings and slabs or layers of concrete and asphalt, such as those used in construction of highways, walkways, and airport runways.

Houses and one-story commercial buildings are more apt to be damaged by expansive soils than are multi-story buildings, which usually are heavy enough to counter the swelling pressures. However, if constructed on wet clay, multi-story buildings may be damaged by shrinkage of the clay if moisture levels are substantially reduced, such as by evaporation from beneath heated buildings.

The best method to prevent or reduce damage from expansive soils is avoidance. When other choices are not possible, applied engineering practices such as removal of the soil, application of heavy loads, preventing access to water, presetting, or stabilization are necessary.

3.3.5.2 *History*

In 1957 the Las Vegas and Eldorado Valleys Area Survey of soil was completed. The area had problems with displacement of house roofs up to 18 inches and concrete slab floors rising as much as 3 feet. In the report, the soil scientists found that these homes were destroyed by swelling soils. Salts in the soil became deliquescent at air temperatures of 41 to 45 degrees F. Upon becoming deliquescent, the salts (sodium sulfate) in the soils took on 10 molecules of water from the atmosphere, causing the damage to homes and other

buildings.

Between 1994 and 1999, Beazer Homes constructed and sold 206 single-family residences on a 40-acre residential subdivision in North Las Vegas. In April 2000, three homeowners filed a complaint against Beazer Homes for construction defects to their homes. The complaint alleged that their houses' foundations and concrete slabs were damaged by expansive soils. *Shuette v. Beazer Homes Holding Corp., 121 Nev. Adv. Op. 82* (2005)

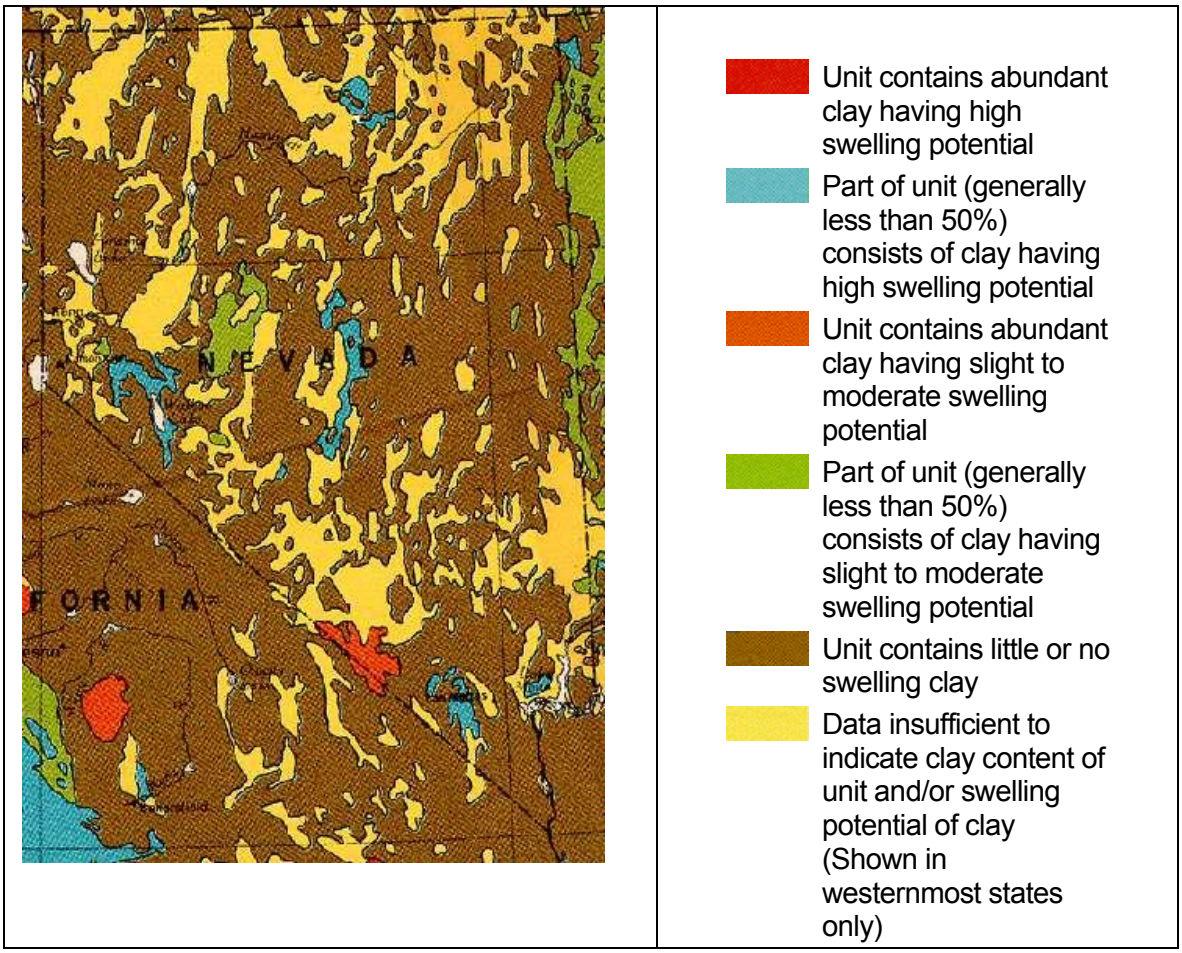


Figure 3-11. Soil Map of Nevada

Source: 1989 U.S. Geological Survey, Swelling Clays Map of the Conterminous U.S. by W.W. Olive, A.F. Chleborad, C.W. Frahme. Julius Schlocker, R.R. Schneider, and R.I. Shuster; 1989

In 1997, Southern Nevada added a required swell test (1803.3) to their building code amendments. This test would determine if certain buildings required special design considerations to counteract soil expansion.

In the 2003 Edition of the International Building Code, The City of Reno amended Chapter 18, Soils and Foundations. They added this sentence to 1802.1 General. ~~–~~The Building Official may require certification of freedom from plastic or expansive materials in base for concrete slabs, fills, and foundations."

In Nye County on the northwest side of Pahrump Valley, expansive soils were blamed for

causing foundation and septic damage to homes in the area. Because of the septic damage, some of the land in the area was contaminated. In response, the Nye County Commission passed a bill in October 13, 2006, requiring disclosure of soil conditions to the buyer.

Expansive clays occur in and near urban areas of Washoe and Storey Counties where hydrothermal alteration (associated with volcanism several million years ago) has converted volcanic rocks to smectite. The problem has been most acute to date in the hills on the north side of Reno and Sparks, but similar rocks occur in the foothills of Peavine Peak, the Virginia Range, and the Carson Range.

One example is a section of U.S. 395 between Clearacre Lane and Parr Boulevard that was reconstructed by NDOT in the early 1990s due to damage from expansive soils in a large cut area of the freeway‘s original construction.

As development encroaches higher up the slopes, this hazard will become more of a risk to homeowners.

3.3.5.3 *Location, Severity and Probability of Future Events*

At this time, the risk of damage due to expansive soils occurs near the higher populated areas of Clark, Nye, and Washoe counties. Figure 3-11 is a soil map of Nevada showing in general the locations of areas in the southern part of the state with soils contaiing a high percentage of high-swelling-potential clay, but more detailed mapping on a much more localized scale is necessary to closely define these areas.

Each of these counties has been amending its building code as described above to avoid damage caused by this risk. Even so, there are many homeowners in these areas filing lawsuits to pay for past damage to their homes from expansive soils.

Expansive soils are considered to be in the ~~L~~low Risk” hazard category from a State perspective because this hazard will most likely be handled efficiently by local authorities through their building codes or by the Nevada Department to Transportation through its building practices in areas prone to this hazard. The Subcommittee will continue to monitor this hazard in the future.

3.3.6 **Extreme Heat** (Low Risk)

3.3.6.1 *Nature*

Heat may kill by pushing the human body beyond its limits. In extreme heat, evaporative cooling is diminished and the body must work extra hard to maintain a normal temperature. Most heat disorders occur because the victim has been overexposed to heat or has overexercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.

Conditions that can induce heat-related illnesses include stagnant atmospheric conditions and poor air quality. Consequently, people living in urban areas may be at greater risk from the effects of a prolonged heat wave than those living in rural areas.

Also, asphalt and concrete store heat longer and gradually release heat at night, which can produce higher nighttime temperatures known as the "urban heat island effect."

Heat waves kill more people in the United States than any other disaster. It was estimated by the University of Delaware that, on the average, 1500 American city dwellers die each year due to heat. By comparison, annual deaths from tornados, earthquakes and floods combined average fewer than 200 nationwide.

Excessive heat during the nighttime hours is a predictor of heat-related injury and deaths. Nighttime temperatures in the 85th percentile of the temperature distribution are likely to set the stage for an increase in heat-related deaths and injuries.

Livestock and pets are also at great risk for heat-related death or injury during long periods of temperatures in the 85th percentile.

Extreme heat coupled with higher elevation produces a hazard to air-traffic due to lower density of hot air. In July of 2006 Las Vegas McCarran International Airport canceled or delayed commercial flights because of heat and altitude density guidelines. Smaller, less powerful aircraft are more at risk of heat related performance problems. Other effects of heat waves include buckled roadways and train derailments.

3.3.6.2 History

Las Vegas is located in a broad desert valley in extreme southern Nevada extending over about 600 square miles elongate from northwest to southeast. Mountains surrounding the valley rise 2,000 to 10,000 feet above the valley floor. The valley is bounded on the north by the Sheep Range, while Boulder City and the Lake Mead National Recreation Area are considered its southern extent. To the west are the Spring Mountains, which include Mt. Charleston, the region‘s highest peak at 11,918 feet. Several smaller ranges line the eastern rim of the valley, including the Muddy Mountains, the Black Mountains and the Eldorado Range.

Official weather observations began in 1937 at what is now Nellis Air Force Base. In late 1948, the U.S. Weather Bureau moved to McCarran Field, now McCarran International Airport. The Las Vegas Valley summers display classic desert southwest characteristics. Daily high temperatures typically exceed 100 degrees with lows in the 70s. The summer heat is tempered by the extremely low relative humidity. Because of the valley‘s typical summer temperatures, residents who are not careful can be overcome by heat-related illness such as sunburn, heat exhaustion, heat cramps, and heat stroke.

Northern Nevada also experiences extreme heat conditions in the summer months. The month of July, 2002 set records for high temperatures. On July 10th and 11th, the Reno Airport reached 108 º F, setting an all time record for that area.

Heat Extreme Events

Table 3-12 is a summary of heat extreme data prepared by the State Climatologist for each county in Nevada, showing the average number of days per year with temperatures greater than 100 º F. This is based on the historical record of available climate summary data for representative sites within each county. The data will assist each county in its emergency

preparedness and response planning for heat extremes. The complete report of heat extremes throughout Nevada from which this table is summarized is contained in Appendix K.

Table 3-12. Heat Extreme Events by Community

County	Community	Average number of days per year with temperature above 100 º F
Carson City	Carson City	1.34
Churchill	Fallon NAS	10.65
Churchill	Hawthorne Airport	8.98
Clark	Searchlight	24.87
Clark	Las Vegas Airport	74.48
Clark	Indian Springs	68.15
Clark	Valley of Fire	83.31
Clark	Mesquite	96.8
Douglas	Minden	2.79
Douglas	Glenbrook	0.00
Douglas	Topaz Lake	1.92
Elko	Elko Airport	3.01
Elko	Jiggs	0.46
Elko	Tuscarora	0.00
Elko	Clover Valley	0.00
Elko	San Jacinto	0.60
Esmeralda	Coaldale Junction	32.10
Esmeralda	Goldfield	0.73
Esmeralda	Silverpeak	23.45
Eureka	Eureka	0.35
Eureka	Beowawe	5.06
Humboldt	Winnemucca Airport	5.86
Humboldt	Quinn River Crossing	3.73
Lander	Battle Mountain	9.55
Lander	Austin	0.18
Lincoln	Elgin	29.81
Lincoln	Caliente	13.84
Lincoln	Pioche	1.49
Lincoln	Pahranagat	28.36
Lyon	Wellington	0.33
Lyon	Yerington	3.62
Lyon	Fernley	10.28
Mineral	Mina	12.65
Mineral	Thorne	8.69
Nye	Tonopah	2.03
Nye	Pahrump	50.71
Nye	Sarcobatus	28.10
Nye	Duckwater	1.12
Nye	Smoky Valley	0.84
Pershing	Imlay	7.64
Pershing	Lovelock Derby Field	11.11

Table 3-12. Heat Extreme Events by Community		
County	**Community**	**Average number of days per year with temperature above 100 º F**
Pershing	Paris Ranch	20.26
Pershing	Derby Field	6.02
Storey	Virginia City	0.02
Washoe	Reno Airport	3.5
Washoe	Vya	0.06
Washoe	Sand Pass	5.57
Washoe	Nixon	4.72
White Pine	Ely Yelland Field	0.04
White Pine	Lund	0.35
White Pine	McGill	0.20
Source: NV State Climatologist		

3.3.6.3 *Location, Severity, and Probability of Future Events*

Although extreme temperature hazard occurs mainly in the southern portion of the state, all of the counties reach high temperatures in the summer months, mainly in July. Nevada's dry desert climate often leads to very low relative humidities during extreme heat episodes. This "dry heat" minimizes the effects of stress on the body, keeping the Heat Index to tolerable values.

Research done by the National Weather Service representative on our planning subcommittee indicates that climate change may be expected to lead to more episodes of extreme heat in Nevada, especially southern Nevada. The number of 100 degree days may likely increase in most low elevation locations, especially below 5000 feet, making the duration and severity of heat waves more extreme.

The Planning Subcommittee rated extreme heat as a "Low Risk" hazard in Nevada; most communities are able to deal with it with normal emergency preparedness and response planning.

3.3.7 **Floods** (High Risk)

3.3.7.1 *Nature*

Flooding is the accumulation of water where there usually is none, or the overflow of excess water from a stream, river, lake, canal, reservoir, or coastal body of water onto adjacent floodplains. Floodplains are lowlands adjacent to water bodies that are subject to recurring floods. Flooding may occur slowly over several days as a result of rainfall or snowmelt, or rapidly due to an event such as an earthquake or dam failure. Flooding due to dam failure is a special case addressed in a separate subsection at the end of the Flood section.

Floods also occur along streams and arroyos (stream channels that are normally dry) that do not have classic floodplains. These include flash floods in mountains (sometimes with rapidly rising water several tens of feet deep) and on alluvial fans, which are typically fan-shaped, gently sloping areas between the steep parts of mountain ranges and the nearly flat valley floors. Because much of Nevada is part of the Great Basin (an area of internal drainage, in which streams are not connected to rivers that flow to the oceans), flood waters commonly drain into interior lakes (e.g. Walker Lake at the terminus of the Walker River, Pyramid Lake at the terminus of the Truckee River), wetland areas (e.g. Carson Sink at the terminus of both the Carson and Humboldt Rivers), or playas (normally dry lake beds, such as Roach Lake, south of Las Vegas, where a new airport is planned).

Floods are described in terms of their extent (including both the horizontal surface area affected and the vertical depth of floodwaters) and the related probability of occurrence.

Factors contributing to the frequency and severity of flooding include the following:

- Time of year and temperature
- Rainfall intensity and duration
- Antecedent moisture conditions
- Watershed conditions, including steepness of terrain, soil types, amount and type of vegetation, and density of development
- Changes in landscape resulting from wild fires (loss of moisture-trapping vegetation and increased sediment available for runoff)
- The existence of attenuating features in the watershed, including natural features such as swamps and lakes, and human-built features such as dams, irrigation ditches, canals, and roadways
- The existence of flood control features, such as levees, flood control channels, and detention basins
- Velocity of flow
- Availability of sediment for transport, and the susceptibility of the bed and banks of the watercourse to erosion

Floods from snow-melt caused by heavy, long-duration rainfall can occur anytime between October and March. Flooding is more severe when antecedent rainfall has resulted in saturated ground conditions, when the ground is frozen and infiltration is minimal, or when warm rain on the snow in higher elevations of the tributary areas adds snow melts to rain flood run-off. These storms are also known as wet-mantle storms.

Severe but localized flooding may also result from cloudburst storms centered over tributary basins. These storms may occur from late spring to early fall, but generally occur in June, July, and August. Runoff from cloud bursts is characterized by high peak flows with a short duration. These storms are also known as dry-mantle storms, causing flash floods or debris flows.

Floods are natural events that are considered hazards only when people and property are affected. Nationwide, on an annual basis, floods have resulted in more property damage than any other natural hazard. Physical damage from floods includes the following:

- Injury or loss of life
- Inundation of structures, causing water damage to structural elements and contents.
- Erosion or scouring of stream banks, roadway embankments, foundations, footings for bridge piers, and other features rendering them unstable or useless.
- Impact damage to structures, roads, bridges, culverts, and other features from high-velocity flow and from debris carried by floodwaters. Such debris may also accumulate on bridge piers and in culverts, increasing loads on these features or causing overtopping or backwater effects.
- Inundation of cars, trucks, and other types of vehicles.
- Destruction of crops, erosion of topsoil, and deposition of debris and sediment on croplands.
- Release of sewage and hazardous or toxic materials as wastewater treatment plants are inundated, storage tanks are damaged, and pipelines severed.

Floods also cause economic losses through closure of businesses and government facilities; disrupt communication; disrupt utilities such as water and sewer service; result in excessive expenditures for emergency response; and generally disrupt the normal function of a community.

3.3.7.2 *History*

The history of flooding on Nevada provides the factual basis for establishing the location, severity and probability of future flooding in Nevada. A chronology of major flooding information is presented below in two tables, Table 3-13 for northern Nevada (includes the Truckee, Carson, Walker and Humboldt watersheds) and Table 3-14 for southern Nevada (includes the Las Vegas area, the lower Colorado River watersheds, and Lincoln County). In addition to major flooding along Nevada‘s rivers, localized flooding has occurred as a result of dam failure, flash floods, debris flows, and mudslides, and failure of canal walls and other irrigation structures, some of which have caused declarations of disaster in parts of Nevada. Major flooding events of this type are also included in the tabulated flood chronologies. Flood studies often use historical records, such as stream flow gauges, to determine the probability of occurrence for floods of different magnitudes. The probability of occurrence is expressed as a percentage for the chance of a flood of a specific extent occurring in any given year.

Table 3-13. Chronology of Major Flooding in Northern Nevada			
Date	**Location**	**Description**	**Estimated Losses**
December 1852	Carson Valley	Two days of heavy snowfall followed by four days of warm rain caused flooding reported in the Carson Valley and likely along other western Nevada rivers as well.	Little damage occurred because most settlements were located away from the low areas. No figures available.
December 1861-January 1862	Carson and Truckee River Basins	Warm rain following heavy snow in December 1861 caused widespread flooding that caused Carson Valley to become a lake.	Little reported damage because most settlements were located along the eastern slope of the Sierra Nevada away from the low areas. No figures available.
1862	Humboldt River Basin	Earliest year in which widespread flooding was recorded throughout the Humboldt River and its sub-basins.	Due to limited human inhabitation, little is known of the damage or effects of the flood. No figures available
December 1867-January 1868	Carson and Truckee River Basins	Unseasonably warm rain from late December through early January melted heavy snow pack in the Sierra Nevada. Carson Valley became a lake and flooding exceeded the 1861 flood crest. All bridges in the Carson Valley were swept away.	No figures available
December 1867-January 1868	Humboldt River Basin	Wet-mantle flooding in the South Fork of the Humboldt River and its tributaries caused localized flooding.	Few records of damage are available.
January-June 1870	Humboldt River Basin	Wet-mantle flooding in the South Fork of the Humboldt River and its tributaries caused localized flooding.	Few records of damage are available.
April 25 1876	Humboldt River Basin	Failure of an irrigation dam across the Humboldt River at Shoshone Canyon, about 22 miles east of Battle Mountain near present-day Dunphy resulted in a huge volume of water rushing through the canyon and flooding several ranches in the river bottom below.	No figures available
July 23 1876	Humboldt River Basin	A series of heavy thunderstorms in the headwaters of Maysville, Crum, Dean and Lewis canyons draining Mount Lewis, southeast of Battle Mountain caused severe localized dry-mantle floods downstream. The most severe was the Lewis Canyon flood that	No figures available

Table 3-13. Chronology of Major Flooding in Northern Nevada			
Date	**Location**	**Description**	**Estimated Losses**
		destroyed nearly every building in the mining town of Lewis. Heavy rain. Along the stream bottoms, 50-foot high cottonwoods and willow thickets were uprooted and mixed together with bottom soil and huge boulders into debris flows that traveled up to 10-12 miles downstream.	
August 15 1878	Humboldt River Basin	Thunderstorm-induced dry-mantle flooding caused a wall of water, mud and rocks up to ten feet high to flow down Pony Canyon and along Main Street in Austin. The flood destroyed both residential and commercial buildings, and left a three-foot layer of mud and debris in Austin‘s streets. It took three months of intense efforts to fully repair the damage.	No figures available
January-May 1881	Little Humboldt River Basin	Sustained rains on heavy winter snow pack caused extensive localized flooding. All reservoir dams along Kelly Creek and in Squaw Valley were completely destroyed and were never rebuilt. Mines were flooded, mill dams and roads were washed out, bridges were damaged and livestock drowned.	No figures available
June 27 1883	Humboldt River Basin	The last remaining dam on the Humboldt River at Lovelock broke leaving a number of the largest ranchers without irrigation water.	No figures available
May-June 1884	Humboldt River Basin	Rapid snow melt and heavy spring rains caused an extensive period of wet-mantle flooding in the Humboldt River Basin and its tributaries. In Austin, flooding damaged the Manhattan Mill and the sawmill. Reese River washed out the Nevada Central Railroad line 40 miles south of Battle Mountain. Flooding along the lower Humboldt formed a vast lake extending over thirty miles from Beowawe to Battle Mountain, covering the railroad track and damaging the road bridge across the Humboldt River in Battle Mountain. Later in June, the dam at the Humboldt dike outflow of the Humboldt River and Toulon Lakes, was blown up by local ranchers after which it	Few records of damage are available.

Table 3-13. Chronology of Major Flooding in Northern Nevada			
Date	**Location**	**Description**	**Estimated Losses**
		was never rebuilt.	
January-February 1886	Reese River sub-basin of the Humboldt River Basin	Heavy rain on snow pack caused flooding along the entire Reese River drainage system and Humboldt from Austin to Battle Mountain causing extensive erosion and sedimentation damage.	No figures available
March-June 1890	Humboldt River Basin	Spring melting of the huge snow pack from the 1889-1890 —Winter of White Death" caused flooding that destroyed bridges on the only two main N-S roads between Elko and the White Pine mines, closing those roads. Maggie and Susie Creeks flooded low-lying areas of Carlin. Flooding caused heavy livestock losses along the Reese River drainage, near Battle Mountain, and in Paradise Valley that eventually drove the large cattle companies into liquidation. Two of Lovelock Valley's five irrigation dams along the Humboldt River were completely washed away.	No figures available
May 1906	Humboldt River Basin	Heavy rainfall caused the failure of a reservoir dam with six deaths resulting. Various structures were damaged and horses and mules died. Southern Pacific railroad tracks were undermined.	Six lives were lost. No figures available on other losses.
March 1907	Walker, Carson and Truckee River Basins	Snow and later rain from March 16 through March 20 flooded the Truckee, Carson and Walker Rivers. The Truckee River severely damaged the Electric Light Bridge. In Carson Valley, all bridges on the East and West Forks and the main-stem of the Carson River as well as Carson River were destroyed or seriously damaged.	No figures available
February - April 1907	Humboldt River Basin	Heavy rains melted deep winter snow pack in the lower Humboldt River Basin below Battle Mountain caused flooding along the entire lengths of both the Little Humboldt River and the main Humboldt River, and their tributaries. Flooding drowned one person and some livestock.	No figures available
February-April 1910	Humboldt River Basin including Mary's River	Warm rain on snowpack caused the worst flooding in history with a greater than 100 year recurrence interval. Carlin, Elko, Battle Mountain, Winnemucca, and Lovelock	No figures available

Table 3-13. Chronology of Major Flooding in Northern Nevada			
Date	**Location**	**Description**	**Estimated Losses**
		areas were all severely flooded. Flooding severely damaged mining camps and all railroad bridges and tracks in the region. All major irrigation dams and canals were washed out throughout the region	
July 1913	Little Humboldt River Sub-basin	Dry mantle flooding from severe thunder and rainstorms. Widespread damage to hay fields in Paradise Valley, Humboldt County. A stranded automobile was covered with 25 to 30 feet of debris.	No figures available
January-April 1914	South fork Humboldt River	Rain on melting snow caused wet mantle flooding that damaged multiple bridges, roads, trestles, reservoirs, diversion channels, and farms.	No figures available
February - March 1917	Humboldt River Basin	Wet-mantle flooding along the lower reaches of the Humboldt River Basin caused considerable road and bridge damage below Lamoille Creek. High water in the South Fork drainages washed out roads and bridges between Jiggs and Elko and lowlands around Ryndon were inundated. Pine Creek flooding damaged or destroyed the railroad grade and bridges disrupting railroad traffic for two weeks.	No figures available
June 22 1918	Humboldt River Basin	Heavy rains in the Santa Rosa Mountains caused dry-mantle flooding in the Paradise Valley area of the Little Humboldt River sub-basin. There was localized flooding along drainages west and northwest of Paradise Valley.	No figures available
January 1921	Truckee Canal, part of the TCID irrigation system	The Truckee Canal was breached at approximately Station 1100+00. (later identified by the Regional Engineer in field review following 2008 breach).	No figures available
February-March 1921	Humboldt River Basin	Wet mantle flooding caused moderate damage to railroad track and bridges and extensive damage to meadow lands in the basin.	No figures available
April–June 1922	Humboldt River Basin	Wet mantle flood event locally within the Maggie Creek and Little Humboldt River sub-basins. (Maggie Creek experienced its highest flow on record, which stood until 1962).	No figures available
July 1927.	Browns Creek, SW	More than two inches of rainfall per hour caused the Grass Lake irrigation reservoir	No figures available

Table 3-13. Chronology of Major Flooding in Northern Nevada			
Date	**Location**	**Description**	**Estimated Losses**
	of Reno, Washoe County	to fail flooding land below.	
March 1928	Walker, Carson and Truckee River Basins	Snow and rain from March 23 through March 26 caused flooding in the Carson Valley, where both forks of the Carson River and the main-stem Carson River overflowed their banks, but little damage was caused.	No figures available
March–June 1932	Humboldt River Basin	Rapid heavy snowmelt caused flooding in the Humboldt River Basin, especially in Lovelock Valley. The Big Five Diversion was washed out (damaged earlier in 1910 and 1914)	No figures available
December 1937	Carson and Truckee River Basins	Heavy rain on snowpack from December 9 through December 13 caused flooding. On the East Fork Carson River, the Douglas Power (Ruhenstroth) Dam was severely damaged. In the south end of Carson Valley near Gardnerville, the flood on the East Fork Carson River crested at 10,300 cfs late in the afternoon of December 11.	No figures available
December 1937-May 1938	Humboldt River Basin	Heavy snows and rain caused extensive flooding in the Little Humboldt River sub-basin and bridge damage in Paradise Valley.	No figures available
April-May 1942	Humboldt River Basin	Severe wet mantle event caused extensive flooding in Elko with water several feet deep in the streets, as well as Battle Mountain. Extensive damage to bridges, roads, irrigation structures, dams, canals, ranch buildings and erosion damage to cropland range areas.	No figures available
January 1943	Upper Humboldt River Basin	Severe wet mantle flooding washed out Hot Creek reservoir and levees in Elko County. Flooding closed highways and caused severe damage to railroads, roads, bridges, and structures throughout the basin.	No figures available
November December 1950	Walker, Carson and Truckee River Basins.	From November 13 to December 8, continued rain and high temperatures melted early snow pack in the Sierra Nevada causing flooding along the Walker, Carson and Truckee Rivers. The greatest discharge was in the urban areas of Reno and Sparks, where water stood 4 feet deep in the main floor of the Riverside Hotel.	The estimate of damages in the three river basins was $4.4 million (U.S.G.S., 1954; $27.6 million in 1997 dollars); half in Reno. Two deaths were reported, and

Table 3-13. Chronology of Major Flooding in Northern Nevada			
Date	**Location**	**Description**	**Estimated Losses**
		Over 3,500 acres of agricultural land in the Truckee Meadows East of Reno was flooded.	about 200 persons were evacuated from their homes.
February-May 1952	Humboldt River Basin	Wet mantle flood due to rapid melting of the snowpack caused considerable damage throughout the basin to roads, bridges, railroad tracks, ranches. Much watershed erosion and extensive damage to dams and levees.	No figures available
July 1952	Humboldt River	Reese River sub-basin. Violent summer thunderstorms caused extensive mud- and debris flows of water, mud, rocks, and logs on many of the Toiyabe Range drainages south of Austin. Extensive gullying, channel head-cutting and sheet erosion damaged crop irrigation systems.	No figures available
December 1955	Truckee, Carson and Walker River Basins	Intense late December storm dropped 10 to 13 inches of rain that melted snow pack in the Northern Sierra Nevada causing flooding along the Walker, Carson and Truckee Rivers. Downtown Reno area flooding was as extensive as in 1950 but damage to buildings was not as severe as that of the 1950 flood due in part to pumping and erection of sandbag dikes. The Reno airport was flooded to a depth of 4 feet. Derby Dam on the Truckee River east of Vista failed, and Hobart Dam, at the headwaters of Franktown Creek failed and released water that severely damaged U.S. 395.	The estimate of damages in the three river basins was $3,992,000 ($22,327,000 in 1997 dollars). One life was lost.
December 1955	Truckee, Carson and Walker River basins	Flooding on tributary streams draining the area surrounding Reno and Sparks caused damage to property in areas away from the Truckee River.	No estimates
August 6-28 1961	Humboldt River Basin	Battle Mountain subbasin. A series of thunderstorms resulted in severe channel cutting, mud & rock flows and sedimentation in streams draining the western slopes of the Cortez Range in Crescent Valley.	No figures available
February 1962	Humboldt River Basin	Wet mantle flooding caused extensive damage to Battle Mountain, where over 200 residents were evacuated due to water depth of up to 5 feet. Up to 1,500 head of cattle drowned. There was extensive	Estimated 1962 value of losses was approximately $1.5 million.

Table 3-13. Chronology of Major Flooding in Northern Nevada			
Date	**Location**	**Description**	**Estimated Losses**
		railroad damage and damage to buildings, diversion structures, irrigation ditches, and cultivated fields throughout the basin.	
January February 1963	Truckee, Walker and Carson River Basins	After months of drought, an intense high-temperature storm lasted from January 28 through February 1, dropping up to 13 inches of precipitation. There was extensive flooding in Reno with about 20 square blocks in the downtown area inundated up to 4 feet deep. The airport was flooded as in 1955.	Damage in the three river basins at the time was estimated at $3,248,000.
December 1964	Truckee and Carson River Basins	Torrential warm rains over December 21-23, melted part of the snow pack causing flooding similar to the December 1955 flood.	The estimate of damages in these two river basins at the time was $2,236,000.
January 1969	Humboldt River Basin	Heavy rain on snow caused flooding on the Little Humboldt River and on Martin Creek which enters Paradise Valley. Peak outflows of the Little Humboldt were recorded at 2,380 cfs	No figures available
May 1983	Ophir Creek, Washoe Valley, Washoe County	A landslide off Slide Mountain hit Upper Price Lake and sent a 15- to 20-foot-high mudflow of water, mud, and boulders traveling 40 mph, down Ophir Creek into Washoe Valley killing one person and covering an 1,800-foot stretch of U.S. Highway 395 with mud and debris.	One person was killed, several injured and multiple residences damaged; No figures on damages.
April-June 1984	Humboldt River Basin	Extensive snow melt with a recurrence interval >100	No data on damages.
February 1986	Truckee and Carson River Basins	Unprecedented rains over a 10-day period in February 1986 caused severe flooding along the in the Truckee and Carson River Basins and to a lesser extent along the Walker River. Maximum precipitation for the period was 12 inches in valley areas, 20 inches in the foothills of the Sierra Nevada, and 30 inches in the higher mountains. Flows in the Truckee River in the Reno-Sparks area and in the Carson River at Carson City were the greatest since 1963. Downstream on the Carson River near Fort Churchill, the flow was the greatest since record-keeping began in 1911 In the Truckee Meadows. All but two bridges in Reno over the Truckee Rivers were closed. The rains caused several small landslides. Some residents became	Damage resulting from this flood was estimated at the time to be $12,700,000.

Table 3-13. Chronology of Major Flooding in Northern Nevada			
Date	**Location**	**Description**	**Estimated Losses**
		stranded or were evacuated.	
March 1995	Long Valley Creek, Truckee River Storey County	Flooding occurred in the Rainbow Bend subdivision at Lockwood where Long Valley Creek enters the Truckee River in Storey County	Caused over $2.5 million in damage
December 1996	Truckee Canal – part of the TCID irrigation system	The Truckee Canal (part of the TCID irrigation system) was breached early on in the Truckee River flood event, flooding 60 homes in the Fernley area. Canal breach occurred at approximate Canal Station 800+00 on the north embankment. The breach site was identified by the Regional Engineer in field review following the 2008 canal breach.	More than 60 homes were flooded.
December 1996 - January 1997	Truckee, Carson, and Walker River Basins	Heavy snow and rain from December 1996 into January 1997 melted Sierra Nevada snow pack causing widespread flooding over approximately 63,800 acres. Floods inundated many residences and businesses in the Truckee Meadows, closed most bridges across the Truckee in Reno, closed the Reno/Tahoe International Airport, and flooded warehouses up to 6 feet deep in the industrial sections of Sparks and east Reno.	Two lives were lost: one in Washoe County and one in Douglas County. Direct damages estimated between $167 million and $169 million. Additional hundreds of millions of dollars in lost business and travel.
January 1997	Carson, Douglas, Lyon, Storey and Washoe	Flooding, mudslides and debris flows along smaller drainages in Carson, Douglas, Lyon, Storey and Washoe counties were coincident with the flooding on the major rivers in northern Nevada.	No estimates
June 2002	Northern Reno-Sparks area	Flash flood and debris flow/mudslide occurred on the alluvial fan where the new Spanish Springs High School was in the final stages of completion, Washoe County.	More than $500,000 damage to the new Spanish Springs High School
Dec., 2005-Jan. 2006	Elko County	In Elko County, winter flooding damaged two bridges in Jarbidge, the Midas Road, and irrigation structures and cattle guards along the Tuscarora Road.	
Dec. 31, 2005-Jan 1 2006	Truckee River	Up to 6-8 inches of rain in the Lake Tahoe basin caused widespread localized flooding along the eastern Sierra. The Truckee River crested at about 13.6 feet, 2.6 feet above flood stage in downtown Reno, flooding several buildings in the downtown area and an undetermined	Undetermined amount

Table 3-13. Chronology of Major Flooding in Northern Nevada			
Date	**Location**	**Description**	**Estimated Losses**
		number of businesses downstream in the Sparks industrial area where it crested at 19.2 feet, 4.2 feet above flood stage. The State EOC was activated and reported that five counties made local declarations.	
Jan 1 2006	Carson River Basin including tributaries in Carson Valley, Carson City and the Dayton Valley area	Widespread heavy rain from December 30-31, 2005 caused flooding throughout the Carson River Basin. USGS stream flow data indicate the flow at East Fork Carson River near Gardnerville, Nev., peaked at 8,920 cfs; the flow at Carson River near Carson City, Nev. at 13,200 cfs, and the flow at Carson River at Fort Churchill, Nev. at 10,300 cfs.	Undetermined amount
January 5-8 2008	South of Cottonwood Lane, Fernley area, Lyon County	The Truckee irrigation canal breached at 4:19 AM flooding about 800 homes and displacing about 1500 residents from flooded homes in the Green Valley, Tuscany Villa, Aspen Meadows, Shady Grove and Farm Lane areas.	There were 3.92 estimated damages to public infrastructure. There was a ten million dollar settlement collectively from insurance, the irrigation companies and the counties involved.

Figure 3-12. August 22, 2012 Flooding, Las Vegas Residential Area.

Photo courtesy of Bob Marshall, Supervisor, Southern Nevada Region, Division of Emergency Management and Homeland Security, Las Vegas.

The history of flooding in southern Nevada is summarized below in Table 3-14. Please see Appendix K for additional State Climatologist data pertaining to precipitation extremes by county and Section 7 for flood history sources.

Table 3-14. Summary of Major Flooding in Southern Nevada

Date	Location	Description	Estimated losses
March 31, 1906	Las Vegas Valley	Flooding: 70 miles of track, bridges, and fills were swept away.	No property damage estimate is available
August 25, 1906	Las Vegas Valley	Heavy rains: the water washed through the streets in heavy torrents.	No property damage estimate is available
August 15, 1908	Indian Springs area, Las Vegas Valley	Cloudburst: 10 miles west of Las Vegas. Flooding washed out one mile of road.	No property damage estimate is available
August 21, 1909	Las Vegas Valley	Heavy rains caused flooding that damaged 30 feet of railroad track north of Las Vegas.	No property damage estimate is available
January 8, 1910	Las Vegas Valley	Melting snow and torrential storms: major flooding, washed away farms, trains, roads, etc. A train was washed away in Caliente area. Muddy Valley had the largest flood in years.	No property damage estimate is available
January 15, 1910	Virgin Valley area, Las Vegas Valley	Flooding in the Virgin Valley area washed away a home, dams, livestock and crops.	No property damage estimate is available
January 18, 1911	Las Vegas Valley	The Salt Lake Railway was washed out by flooding.	No property damage estimate is available
March 18, 1911	Las Vegas Valley	Snowstorms and rain flooded out the Salt Lake Railway.	No property damage estimate is available
February 28, 1914	Las Vegas Valley	Several washouts took out the railway. It also took out two farms.	No property damage estimate is available
May 12, 1917	Las Vegas Valley	Large flood: road between Goodsprings and Jean was damaged.	No property damage estimate is available
August 4, 1917	Las Vegas Valley	Large flood damaged alfalfa crops on Moapa Indian Reservation.	No property damage estimate is available
March 16, 1918	Las Vegas Valley	Large flood damaged farms in Mesquite and Bunkerville.	No property damage estimate is available
July 24, 1920	Las Vegas Valley	Heavy storm: crops and boarding house were destroyed.	No property damage estimate is available
August 27, 1921	Las Vegas Valley	Heavy torrential rain: Las Vegas had no damage, Moapa Valley had damaged roads, Rio Virgin Valley had a lot of damage.	No property damage estimate is available
January 7, 1922	Las Vegas Valley	Flashflood through Meadow Valley Wash. Damaged railroad tracks to Caliente.	No property damage estimate is available
July 14, 1923	Las Vegas Valley	Flashflood: damage to farms, damage to the road from Las Vegas to Searchlight.	No property damage estimate is available
July 28,	Las Vegas Valley	Thunderstorm in Las Vegas caused	No property damage

Table 3-14. Summary of Major Flooding in Southern Nevada			
Date	**Location**	**Description**	**Estimated losses**
1923		damage to commercial, residential, and public buildings. Severe fiscal damage to the railroad company.	estimate is available
August 28, 1925	Las Vegas Valley	Heavy storm: Las Vegas to Searchlight road damaged.	No property damage estimate is available
Sep. 19, 1925	Las Vegas Valley	Flash flood caused considerable damage to farms.	No property damage estimate is available
August 30, 1927	Las Vegas Valley	Highways around Las Vegas were flooded.	No property damage estimate is available
August 5, 1929	Las Vegas Valley	Heavy deluge washed out highways around Las Vegas and several roads in the city.	No property damage estimate is available
August 27, 1929	Las Vegas Valley	Heavy deluge wrecked a state highway near Charleston turnoff.	No property damage estimate is available
August 23, 1930	Las Vegas Valley	Cloudburst damaged Arrowhead Trail, section of an underpass, and the highway.	No property damage estimate is available
August 12, 1931	Las Vegas Valley	Heavy rainstorm, cloudburst, caused structural damage to commercial property.	No property damage estimate is available
July 11, 1932	Las Vegas Valley	Heavy storm caused much structural damage.	No property damage estimate is available
August 27, 1932	Las Vegas Valley	Lower Virgin River Bridge was washed out from three cloudbursts.	No property damage estimate is available
August 29, 1932	Las Vegas Valley	Heavy deluge: farms around Mesquite covered in one to three feet of mud.	No property damage estimate is available
August 21, 1933	Las Vegas Valley	Heavy deluge: Midway residents reported mud in their homes.	No property damage estimate is available
August 21, 1934	Las Vegas Valley	Heavy deluge: Fremont street became a raging river.	No property damage estimate is available
September 24, 1935	Las Vegas Valley	Cloudburst washed away roads on the Los Angeles highway.	No property damage estimate is available
July 31, 1936	Las Vegas Valley	Cloudburst: two feet of water on Arden Highway. Washed out Charleston Highway.	No property damage estimate is available
September 24, 1937	Las Vegas Valley	Cloudburst near Glendale washed a car over a culvert.	No property damage estimate is available
March 3, 1938	Las Vegas Valley	Continuous rain and flooding caused damage to Boulder City.	No property damage estimate is available
June 28, 1938	Las Vegas Valley	Rain at Indian Springs sent flood water to Las Vegas. Telephone lines in Las Vegas were down.	No property damage estimate is available
September 5, 1939	Las Vegas Valley	Heavy rains in Southern Nevada and Southern Utah; also severe damage to the Moapa Indian Reservation.	No property damage estimate is available
September	Las Vegas Valley	Heavy rains caused damage to	No property damage

Table 3-14. Summary of Major Flooding in Southern Nevada			
Date	**Location**	**Description**	**Estimated losses**
10, 1939		Eldorado Canyon district between Boulder City and Kingman.	estimate is available
February 2, 1940	Las Vegas Valley	Heavy rains caused washouts on the Charleston highway.	No property damage estimate is available
August 13, 1941	Las Vegas Valley	Two railway bridges were swept away in the flood.	No property damage estimate is available
August 10, 1942	Las Vegas Valley	Rain and hail, trailer camps were devastated.	No property damage estimate is available
July 9, 1945	Las Vegas Valley	Flooding in Overton. Union Pacific railway main line was washed out.	No property damage estimate is available
August 1, 1945	Las Vegas Valley	Moapa Valley flooded, damaging crops.	No property damage estimate is available
July 25, 1946	Las Vegas Valley	Cloudburst in Mesquite, killing one person.	One person died. No property damage estimate is available
October 13, 1947	Las Vegas Valley	Flooding in Las Vegas; Fremont Street flooded; worst storm since 1945.	No property damage estimate is available
September 8, 1950	Las Vegas Valley	Torrents of water roared down Fremont Street.	No property damage estimate is available
July 20, 1951	Las Vegas Valley	Two cloudbursts; standing water in the homes near Boulder highway.	No property damage estimate is available
August 28, 1951	Las Vegas Valley	Windstorm and cloudburst caused property damage in North Las Vegas.	No property damage estimate is available
September 21, 1952	Las Vegas Valley	Heavy rainfall caused power outage in Henderson.	No property damage estimate is available
June 27, 1954	Las Vegas Valley	Heavy rainfall and several cloudbursts, Las Vegas Wash boiled over, several homes were filled with mud.	No property damage estimate is available
July 26, 1954	Las Vegas Valley	Flood torrents throughout the Las Vegas Valley, affected power lines, roads, homes.	No property damage estimate is available
August 25, 1955	Las Vegas Valley	Worst storm, Union Pacific railroad was disrupted for 8 hours.	No property damage estimate is available
July 26, 1957	Las Vegas Valley	Cloudburst, phones out of service, damage to low-level homes near Charleston Blvd.	No property damage estimate is available
August 21, 1957	Las Vegas Valley	Flooding damaged city streets and shut down highways out of Las Vegas.	No property damage estimate is available
June 22, 1958	Las Vegas Valley	Flash flood washed out a five-mile section of Nelson Road.	No property damage estimate is available
November 11, 1958	Las Vegas Valley	Flash flood in Las Vegas.	$60,000 worth of damage to Las Vegas including debris cleanup
July 22, 1960	Las Vegas Valley	Flash thunderstorm in Las Vegas; phone lines were downed.	No property damage estimate is available
August 29,	Las Vegas Valley	Heavy rainfall, some mobile homes	No property damage

Table 3-14. Summary of Major Flooding in Southern Nevada			
Date	**Location**	**Description**	**Estimated losses**
1961		had to be evacuated.	estimate is available
September 18, 1961	Las Vegas Valley	Lamb Blvd was washed out by the deluge; power was knocked out throughout the valley.	No property damage estimate is available
April 8, 1965	Las Vegas Valley	Rain washed out road beds in Clark County.	No property damage estimate is available
August 7, 1967	Las Vegas Valley	Flooding in Las Vegas; 14th and 25th Streets caved in.	No property damage estimate is available
August 19, 1967	Las Vegas Valley	Flash flood: damaged US Highway 95 between Las Vegas and Searchlight.	No property damage estimate is available
September 6,1967	Las Vegas Valley	Severe flooding Tonopah Highway (US 95) was damaged.	No property damage estimate is available
January 24, 1969	Las Vegas Valley	Rainstorms washed out roads and buried cars in mud.	No property damage estimate is available
February 1969	Amargosa River drainage basin and Amargosa Valley, Nye County	Largest recorded flood in 25 years in the Amargosa River drainage.	No property damage estimate is available
August 20, 1973	Las Vegas Valley	Las Vegas Wash Marina was severely damaged by a thunderstorm	No property damage estimate is available
September 14, 1974	Eldorado Canyon, Las Vegas Valley, Clark County	A flash flood/debris flow swept away mobile homes, cars, a restaurant, and drowned at least 9 people in Eldorado Canyon. Water depth was up to 20 feet, and up to 40 feet of sediment was deposited near Nelson's Landing on the shore of Lake Mead.	At least 9 people were killed. No property damage estimate is available
July 3-4, 1975	Las Vegas Valley	Heavy thunderstorm precipitation exceeding 3 inches between Las Vegas and the mountains to the south, west, and north, caused record peak flows of Tropicana Wash, Flamingo Wash, Las Vegas Creek, and Las Vegas Wash.	Two people were drowned. Total property damage was estimated by the Clark County Flood Control District at $4.5 - $5 million
August 10, 1981	California Wash, Logan Wash, Overton Wash, Valley of Fire Wash and the lower Muddy River. Moapa Valley area, Lake Mead Recreation area and Las Vegas	Thunderstorm-related intense rains up to 6.5 inches in less than an hour fell on southern Nevada. Major flooding and record runoff. Record floods in the Moapa Valley area did the most serious damage. California Wash flooding heavily damaged Hidden Valley Ranch dairy farm, where approximately 500 cows drowned, and twenty mobile homes were destroyed or damaged. Muddy River at Glendale below California Wash overflowed the	Tens of millions of dollars worth of damage to the Moapa Valley area, Overton, Lake Mead Recreation area and Las Vegas

Table 3-14. Summary of Major Flooding in Southern Nevada			
Date	**Location**	**Description**	**Estimated losses**
		bridge by 5 to 6 feet.	
August 14 - 16, 1984	Southern Clark County	Fourth episode of flooding in a month. Up to 3.5 inches of rain from southern Las Vegas to Boulder City caused floods the damaged roads, injured people, caused power outages, engulfed vehicles and flooded four homes in Henderson and 3 units of an apartment complex on East Lake Mead Boulevard.	Officials estimated damage to be more than $2 million.
June 9-10, 1990	Las Vegas Valley, Overton area, Jean area	Floods due to intense rainfall caused road closures in the Overton area and wide-spread damage in the Las Vegas Valley. The most intense rainfall was recorded in an area bounded by Tropicana Avenue, Las Vegas Boulevard, Washington Avenue, and Hollywood Boulevard and approximated a 50-year rainfall event in places. Many streets were flooded and there were widespread power outages.	Two flood-related deaths in the Las Vegas Valley. Wide-spread property damage; no estimate is available.
August 14-16, 1990	CalNevAri, Las Vegas Valley, Moapa Valley, Glendale, Muddy River, Meadow Valley Wash	Intense localized rainstorms dropped up to 2.5 inches of rain in Las Vegas Valley and In Moapa Valley causing floods that damaged the roads, bridges, railways, businesses, vehicles and flooded at least 26 homes.	$250,000 in damages to the UPRR tracks near Logandale due to flooding of Logan (Benson) Wash. $100,000 estimated damages to public facilities in the Moapa Valley. No estimate of private property damage is available.
September 6-8, 1991	Clark County/Las Vegas Valley	Localized intense rainfall totaling 1.77 inches on the west side of the Las Vegas Valley flooded streets and caused some damage to sidewalk, curbs, gutters, street pavement and a bridge under construction.	The Clark County Public Works Department estimated the cost of cleanup from this event at $6000 in overtime and equipment.
August 8, 1994	Las Vegas Valley/ Clark County	Intense, localized thunderstorm dropped up to 1.57 inches of rain in NW Las Vegas Valley causing local street flooding and damage to storm	No damage estimate is available.

Table 3-14. Summary of Major Flooding in Southern Nevada			
Date	**Location**	**Description**	**Estimated losses**
		drains, vehicles and a number of residences were flooded.	
March 10-11, 1995	Amargosa River drainage basin and Amargosa Valley, Nye County	Nevada Test Site area: U.S. 95 was closed, Stockade Wash culverts were damaged at Airport Road, H Road crossing and other roads were covered with sediment, and debris and a Nevada Test Site worker was swept away by the flood waters in Fortymile Wash, but managed to escape.	No damage estimate is available.
August 22-23, 1995	Las Vegas Valley/ County	Two localized intense storms each dumped nearly 3/4" of rain in 15 minutes in the Las Vegas Valley on both August 22 and August 23, causing localized flooding of streets where debris blocked culverts.	One person was swept away and drowned. No property damage estimate is available.
August 9-10, 1997	Las Vegas Valley/ County	Line of thunderstorms caused severe flooding in Las Vegas and Boulder City, severe damage to public and private property.	No damage estimate is available.
February 22-23, 1998	Amargosa River drainage, Amargosa Valley, Nye County	A regional storm produced up to 2.81 inches of rain resulting in minor flooding throughout the Amargosa River drainage basin. Floods severely eroded the channel In Fortymile Wash and caused extensive damage to U.S. Highway 95 and to Nevada Test Site roads.	No damage estimate is available.
July 20-24, 1998	Urban areas of the south end of the Las Vegas Valley	Repeated intervals of more than an inch of rainfall in less than an hour in caused localized flooding of streets, damage to drainage systems, and deposition of debris, silt, and sediment on roadways.	Two flood-related deaths were reported. No property damage estimate is available
September 11, 1998	Las Vegas/County	A storm produced up to 2 inches of rainfall in parts of Las Vegas Valley and more than 3 inches of rain in Moapa Valley, causing extensive flooding.	The Clark County Public Works Department estimated that Moapa Valley sustained damage to roadways amounting to approximately $400,000.
December 2004 to January 10-11, 2005	Las Vegas Valley/Lincoln County	Sustained heavy rains in late Dec. 2004 and early Jan. 2005 caused widespread flooding in Las Vegas Valley, along Meadow Valley Wash, Muddy River, and Virgin River in both Clark and Lincoln Counties.	Total flood and storm damage for Lincoln County was estimated at $9.4 million and $4.5 million for Clark County.

Table 3-14. Summary of Major Flooding in Southern Nevada			
Date	**Location**	**Description**	**Estimated losses**
August 27, 2007	SW Las Vegas	Up to 3.11 inches of rainfall caused localized residential flooding and numerous reports of swift water rescues.	No property damage estimate is available
December 17-23, 2010	Virgin River, and Muddy River	An average of 1.77" of rain fell in a 7 day period over Clark and Lincoln Counties. Street closures in Las Vegas Valley and in Moapa. Mesquite on the Virgin River was subject to flooding when the river topped its banks. 2 homes were flooded.	City's cost for flood response and clean up was $422,000. Clark County Public Works repairs totaled $170,000.
August 22, 2012	Las Vegas Valley, Clark Co.	1.5" to 2" of rain in four hours caused one death, numerous water rescues, and limited damages to private and public facilities. Clark Co. - approx. 117 buildings flooded with public infrastructure damage in Mesquite and Overton (Figures 3-12, 3-13)	One death-Henderson: Approximately $976,689 in public infrastructure damage.
September 11, 2012	Las Vegas Valley, Clark Co.	1.15" of rain in about 2 hours at McCarran International Airport.	Henderson damages estimated at $78,500. Las Vegas Valley damages were estimated at $1.4 million.

Figure 3-13. August 22, 2012 Flooding, UNLV Parking Lot

Photo courtesy of Bob Marshall, Supervisor, Southern Nevada Region, Division of Emergency Management and Homeland Security, Las Vegas

3.3.7.3 *Location, Severity, and Probability of Future Events*

3.3.7.3.1 *Location*

Section 3.3.7.2 on the history of flooding in Nevada provides the basis for probable location of future flooding in the state. Major river systems in Nevada along which normal riverine flooding has occurred in the past and will likely occur again are the Carson, Truckee, Walker, Humboldt, Amargosa rivers and the lower Colorado River including its tributaries, the Virgin and Muddy Rivers. Locations of these rivers as well as the locations of major canals, cities, and towns in the state are shown in Figure 3-14 and in Appendix H. Canals and ditches are listed by county in Appendix R.

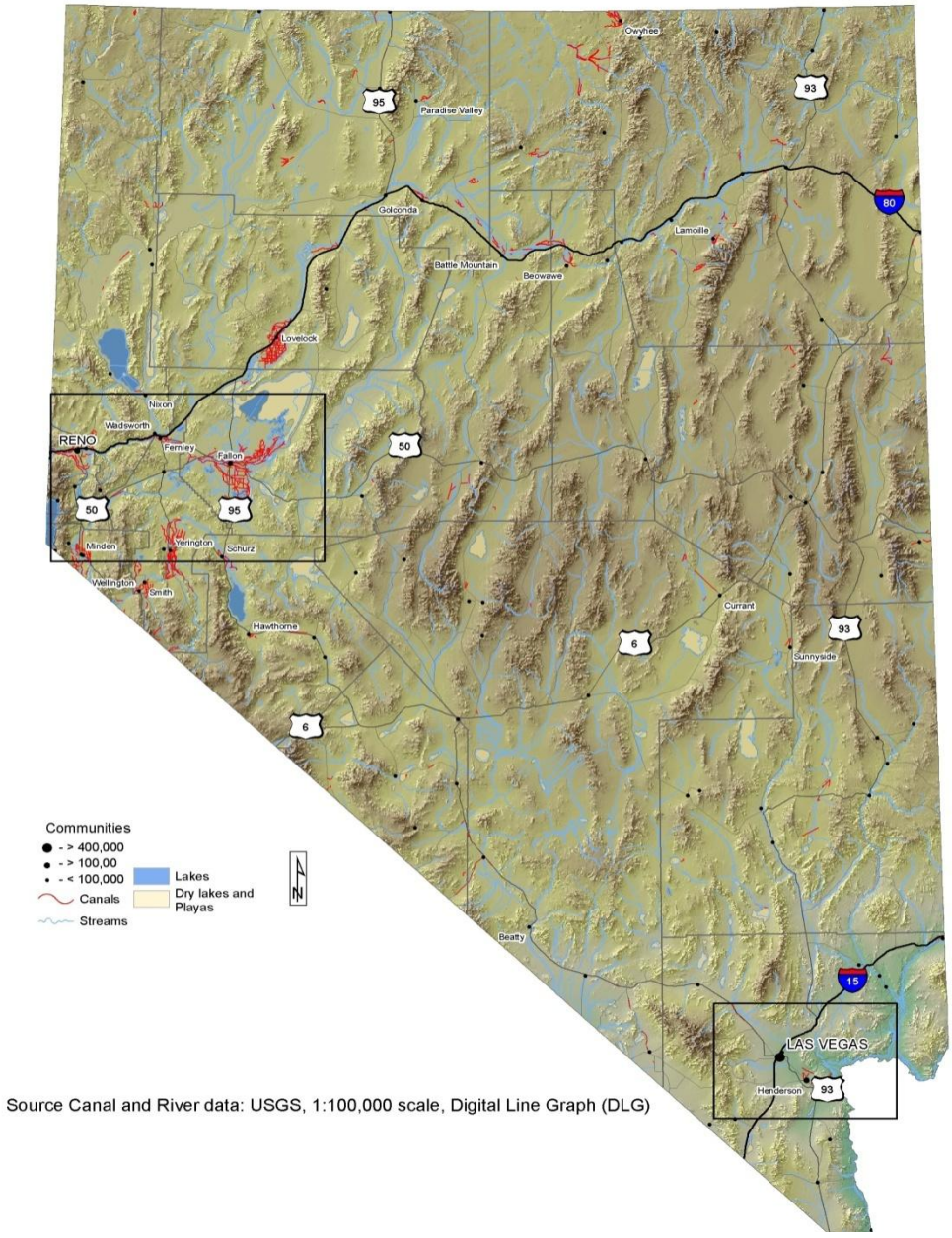
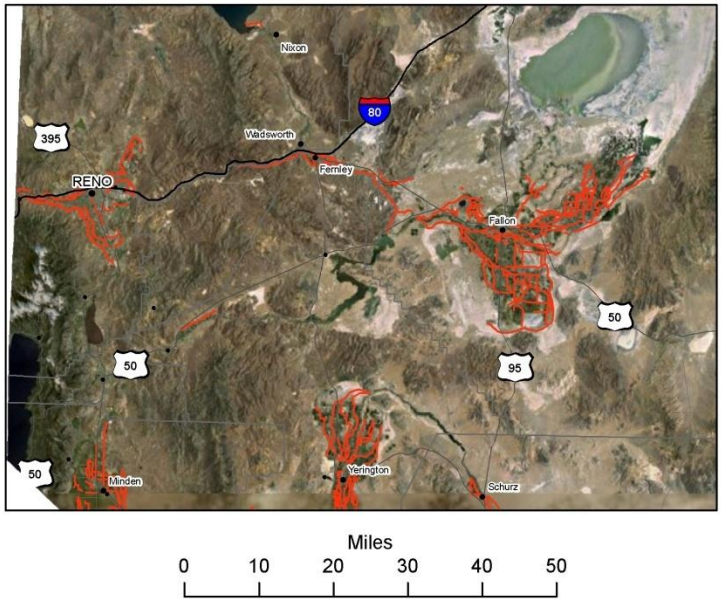
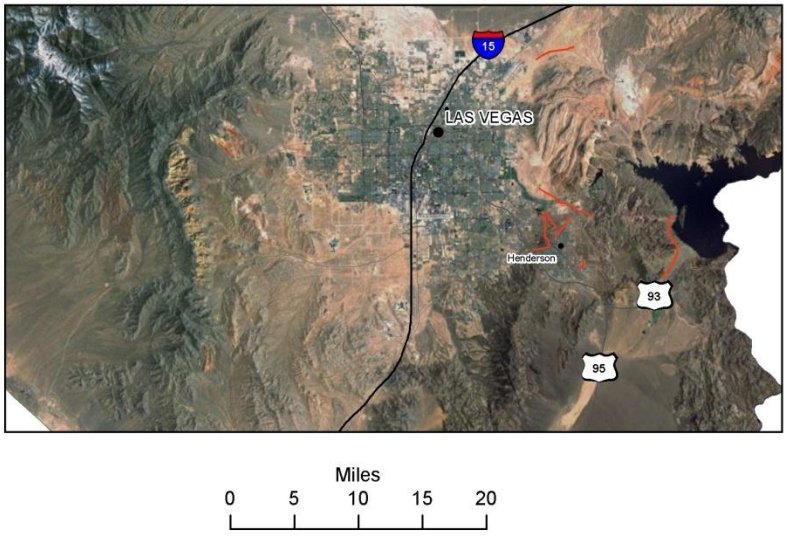


Figure 3-14. Major Rivers and Canals in Nevada *(see insert maps on next page)*

Northern Nevada



Southern Nevada



Source Canal and River data: USGS, 1:100,000 scale, Digital Line Graph (DLG)

Figure 3-14. Major Rivers and Canals in Nevada *(continued from previous page)*

Another view of the location and probability of future flood damages can be obtained from reviewing where levees were built to try to control floodwaters. Data from the National

Levee database, developed by the USACE and FEMA, are available and enhanced by local knowledge. Many levees do not meet the current standards to be recognized as accredited by FEMA, and thus are reflected as Earthen Embankments. To meet the standard of design set out in the Code of Federal Regulations, a Professional Engineer must certify the levee structure in order for FEMA to show the area protected from the 1% annual chance of flood. Table 3-15 below attempts to summarize levee information in Nevada from best sources available at this time.

Table 3-15. Levee Names and Lengths by County in Nevada.

Levee information in NV from best available sources	Sum of Length (miles)
Earthen Embankment	
Clark	
Colorado River	2.157
Las Vegas Wash	2.270
Unnamed Wash	
US-95	2.118
(blank)	5.921
Douglas	
East Fork Carson River	
East Fork Carson River	2.070
Lyon	
Truckee Canal	1.725
Walker River	0.897
Mineral	
Corey Creek Overflow	
Hawthorne, Hawthorn, Cory Creek Overflow	1.397
Pershing	
Humboldt River	3.205
Humoboldt Lake	21.249
Pitt-Taylor Diversion Canal	11.657
Washoe	
Bailey Canyon Creek	0.248
Steamboat Creek	0.302
Thomas Creek	0.938
Truckee River	1.154
Unnamed	0.092
Whites Creek	
P11 in City of Reno	0.692
White Pine	
Steptoe Slough	
Steptoe Slough Levee	12.045
(blank)	**5.228**
FEMA Accredited	
Clark	
Las Vegas Wash	0.271
Muddy R. Wells Siding	
Muddy R. Wells Siding	0.478
Range Wash	
Range Wash Fan	4.965
(blank)	3.452
Washoe	
Truckee River	1.441
USACE	
Lander	
Reese River	
Reese River Levee at Battle Mountain	1.575
Grand Total	**87.546**

Flash floods, debris flows and mudslides have also occurred in the past in the drainages described in the flood chronology tables. However, flash floods, debris flows and mudslides

can occur anywhere in the state where there is unstable wet unconsolidated material located on slopes.

3.3.7.3.2 *Severity*

The National Flood Insurance Program (NFIP) is a Federal program which enables property owners in participating communities to purchase insurance protection against losses from flooding. Data on NFIP flood insurance policies have been collected and compiled by FEMA since 1978. Table 3-16 shows flood insurance policy and claims data from 1978 to 2012 for Nevada counties participating in the NFIP. The dollar amounts of claims paid provides a measure of the severity of flood damages in each county.

As the data indicates, flooding in Washoe County (including the cities of Reno and Sparks) accounts for the largest amount of flood insurance claims paid among counties in Nevada, followed by Clark County (which includes Boulder City, Henderson, Las Vegas, Mesquite, and North Las Vegas) and Douglas County.

Table 3-16. Summary of Total NFIP Insurance Coverage, Premiums Paid and Claims in Nevada Since 1978.

NFIP Policy and Claims Report for Nevada as of December 2012

County	Number of Policies	Total Coverage	Total Premiums	Total Claims Since 1978	Total Paid Since 1978	NFIP claims as a % of total policies
CARSON CITY	637	$160,441,400	$513,035	85	$521,052	13.34%
CHURCHILL COUNTY	322	$70,071,400	$227,331	3	$9,851	0.93%
CLARK COUNTY	5,203	$1,177,837,400	$2,168,145	542	$6,254,374	10.42%
DOUGLAS COUNTY	1,105	$297,095,200	$780,342	148	$2,943,994	13.39%
ELKO COUNTY	111	$23,682,800	$129,541	12	$24,732	10.81%
EUREKA COUNTY	11	$2,295,600	$11,035	1	$588	9.09%
HUMBOLDT COUNTY	16	$2,002,300	$6,834	12	$44,385	75.00%
LANDER COUNTY	171	$23,364,600	$178,221	3	$1,058	1.75%
LINCOLN COUNTY	13	$23,990,900	$84,033	3	$0	23.08%
LYON COUNTY	565	$125,870,700	$325,769	13	$253,656	2.30%
MINERAL COUNTY	262	$31,602,100	$117,601	2	$2,663	0.76%
NYE COUNTY	3,291	$702,731,700	$1,369,214	51	$249,343	1.55%
PERSHING COUNTY	1	$28,800	$304	4	$18,853	400.00%
STOREY COUNTY	217	$41,412,800	$109,846	11	$40,963	5.07%
WASHOE COUNTY	2,546	$725,252,800	$2,636,639	578	$27,651,360	22.70%
WHITE PINE COUNTY	131	$17,823,300	$117,220	6	$390	4.58%
State Total :	14,720	$3,425,503,800	$8,775,110	1,474	$38,017,262	10.01%

Up until 2012, severe repetitive loss and repetitive flood properties were handled under 2

separate FEMA programs: the Severe Repetitive Loss (SRL) Program that provided funding to reduce or eliminate long-term risk of flood damage to SRL structures insured under the National Flood insurance Program (NFIP) and the Repetitive Flood Claims (RFC) grant program to assist States and communities in reducing flood damages to insured properties that had one or more claims to the National Flood Insurance Program (NFIP).

Since then, legislative changes made in the Biggert-Waters Flood insurance Reform Act of 2012 have redefined severe repetitive loss and repetitive loss properties in the following manner:

A severe repetitive loss property is a structure that:

(a) Is covered under a contract for flood insurance made available under NFIP; and

(b) Has incurred flood-related damage –

(i) For which 4 or more separate claims payments have been made under flood insurance coverage with the amount of each such claim exceeding $5,000, and with the cumulative amount of such claim payments exceeding $20,000; or

(ii) For which at least 2 separate claims payments have been made under such coverage, with the cumulative amount of such claims exceeding the market value of the insured structure.

By this definition, Nevada has one severe repetitive loss properties.

A repetitive loss property is a structure covered by a contract for flood insurance made available under the NFIP that:

(a) Has incurred flood-related damage on two occasions in which the cost of the repair on the average equalled or exceeded 25% of the market value of the structure at the time of each such flood event; and

(b) At the time of the second incidence of flood-related damage, the contract for flood insurance contains increased cost of compliance coverage.

By this definition, Nevada has two repetitive loss properties.

Table 3-17 below is a summary of repetitive loss and severe repetitive cases and claims paid due to floods for communities in the State of Nevada. As is consistent with NFIP claims data in Table 3-16, the majority of Repetitive Losses have occurred in the Cities of Sparks and Reno and in Washoe County.

Table 3-17. Summary of Repetitive Loss and Severe Repetitive Loss Properties Due to Flood for Communities in the State of Nevada

Community Name	Number of RL Properties	Number of SRL Properties	Total Claims Paid
City of Las Vegas		1	$299,044
City of Reno	2		$342,975

Note: Data are current as of April, 2013. *Source: NV State Flood Plain Manager*

3.3.7.3.3 *Reducing Flood Damage in Areas of High Flood Probability*

The state is working with a variety of stakeholders to reduce the number of properties considered to be at- risk from flooding and to prevent unwise development of properties in high-risk areas due to flooding.

Carson Water Subconservancy District

The Carson Water Subconservancy District, or CWSD, is a unique multi-county, bi-state agency dedicated to establishing a balance between the needs of the communities within the Carson River watershed and the function of the river system. The thirteen-member Board of Directors consists of representatives from each of the five counties within the Carson River watershed plus two representatives from the agricultural community. Granted no regulatory authority of its own, the CWSD's mission is to work within existing governmental frameworks to promote cooperative action for the watershed that crosses both agency and political boundaries. One of their guiding principles is to maintain the riverine and alluvial fan floodplains of the Carson River watershed to accommodate flood events. The CWSD strives to involve all counties and communities within the watershed in the efforts to preserve the rich history and unique resources of the Carson River watershed.

Clark County Regional Flood Control District

The Clark County Regional Flood Control District was created in 1985 to develop a coordinated and comprehensive Master Plan to solve flooding problems, to regulate land use in flood-hazard areas, to fund and coordinate the construction of flood-control facilities, and to develop and contribute to the funding of a maintenance program for Master Plan flood-control facilities. The District also provides public education regarding flood dangers and monitors rainfall and flow data during storms, disseminating information to appropriate public works and safety crews. The service area for the District includes Clark County and the incorporated cities of Boulder City, Henderson, Las Vegas, Mesquite, and North Las Vegas.

Truckee River Flood Management Authority and the "Living River Plan"

The "Living River Plan" for the Truckee River is a project of cooperative action among state, county, tribal, and private non-profit entities. In the Reno-Sparks-Washoe County area along the Truckee River where the greatest number of repetitive loss properties occurs, several state agencies are cooperating with the Truckee River Flood Management Authority on their "Living River Plan" which has common goals to reduce flood hazards. The Authority's mission includes preventing the disruption of commerce, transportation, communication and essential services which have adverse economic impacts; preventing the waste of water resulting from floods; providing for the conservation, development, use and disposal of water and improved quality of water; providing for ecosystem restoration and enhanced recreational facilities; and providing for the safeguarding of the public health. The plan includes replacement of and improvements to many bridges, levees, and

floodwalls, as well as construction of terraces and berms. The project will also include the acquisition, elevation, and/or demolition of repetitive loss buildings.

Silver Jackets Program

Federal agencies, including the U.S. Army Corps of Engineers (USACE) and the Federal Emergency Management Agency (FEMA), are partnering to form a unified forum to address Nevada's flood risk management priorities. Developed at the state level, Nevada Division of Emergency Management and the Nevada Division of Water Resources have formed an active Silver Jackets program that provides a formal and consistent strategy for an interagency approach to planning and implementing measures to reduce the risks associated with flooding and other natural hazards. Involvement from other federal, state, regional, local, and tribal groups within this program will improve and increase flood risk communication with a unified interagency message and help collaboration on flood mitigation, response, and recovery.

Flood Insurance Rate Maps (FIRMs) / Special Flood Hazard Areas (SFHAs)

The magnitude of flooding used as the standard for floodplain management in the United States is a flood having a 1 percent probability of occurrence in any given year. This 1% annual chance flood is also known as the 100-year flood or base flood. The 100-year floodplain boundaries for identified flooding sources are shown on Flood Insurance Rate Maps (FIRMs) that are prepared by FEMA to show areas with the highest probability of flooding. FIRMs are readily available from FEMA through the Map Service Center website at www.msc.fema.gov. The areas bounded by 100-year floodplain boundaries are also referred to as Special Flood Hazard Areas (SFHAs) and are the basis for both flood insurance and floodplain management requirements of the National Flood Insurance Program. The FIRMs also show floodplain boundaries for the 500-year flood, which is the flood having a 0.2 percent chance of occurrence in any given year. Nevada has approximately 3,250 square miles of mapped Special Flood Hazard Areas (including lakes and reservoirs). Of 3,250 square miles, only about 7% (250 sq. mi.) has had a detailed analysis to determine the base flood (or 100-year flood) elevation or the depth of flooding of the base or 100-year flood. Where available, the base flood elevation or base flood depth is shown on the Flood Insurance Rate Maps.

Locations of mapped Special Flood Hazard Areas in Nevada are shown below in Figure 3-15. In Nevada, Special Flood Hazard Areas are labeled as Zone A, Zone AO, Zone AH, or Zone AE. Federal mandatory flood insurance purchase requirements apply in each of these zones. The definitions for the various types of Special Flood Hazard Areas found in Nevada are:

Zone A – Areas subject to inundation by the 1-percent-annual-chance flood event. Because detailed hydraulic analyses have not been performed, no base flood elevation or depths are shown on FIRMs.

Zone AE – Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. Base flood elevations are shown on FIRMs within these zones.

Zone AH – Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are 1-3 feet. Base flood elevations derived from detailed hydraulic analyses are shown on FIRMs in this zone.

Zone AO – Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain), including areas of alluvial fan flooding, where average depths are 1-3 feet. Average flood depths derived from detailed hydraulic analyses are shown on FIRMs within this zone.

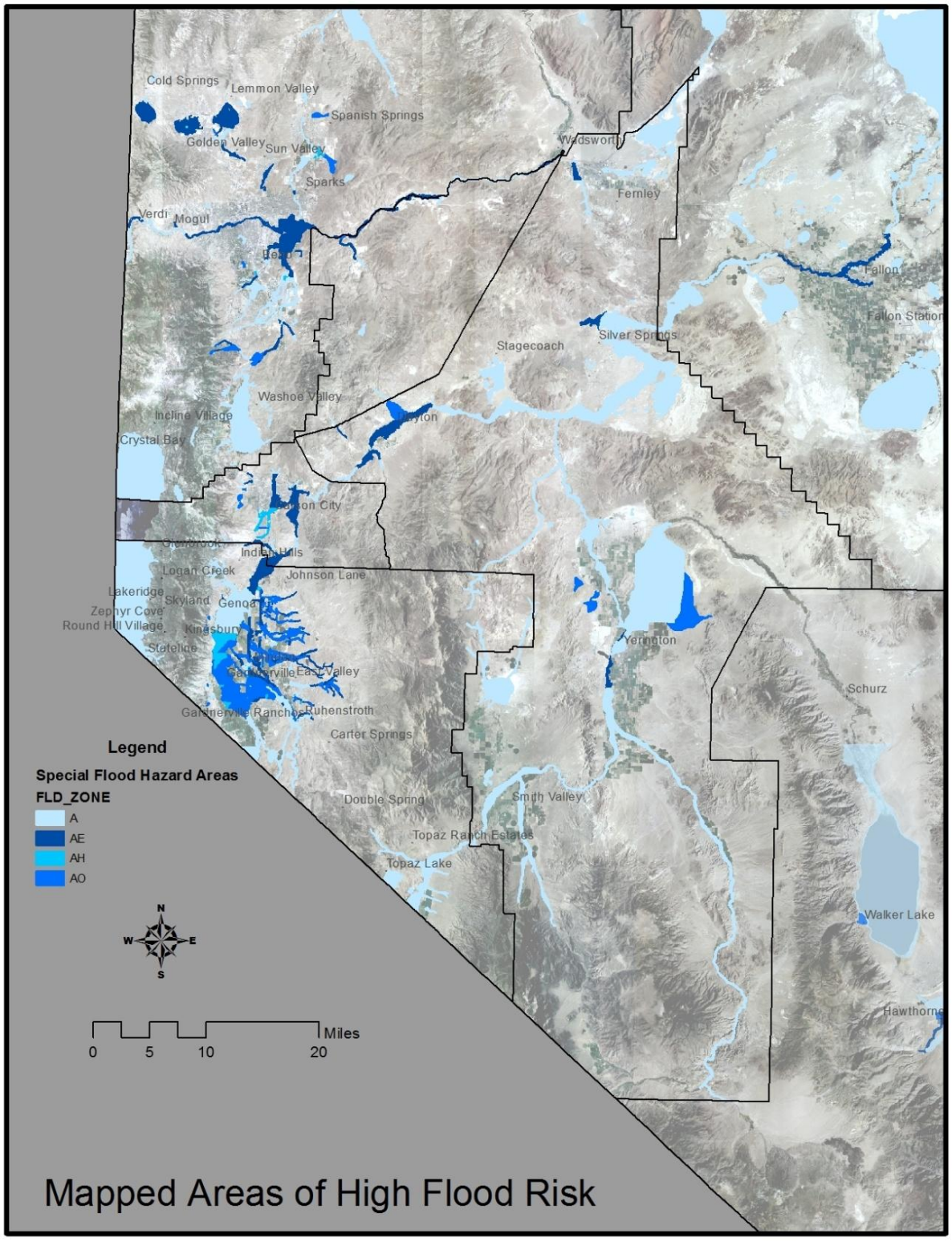


Figure 3-15. Areas Mapped as Special Flood Hazard Areas in Nevada

from FEMA Flood Insurance Rate Maps

A Special Flood Hazard Area is defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year.

In 2010 FEMA initiated its Risk MAP (Mapping, Assessment, and Planning) program for flood hazard mapping. The Risk MAP program builds on flood hazard data and maps produced during the Flood Map Modernization (MapMod) program, available at this link http://www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/map-modernization . During the MapMod program, Nevada's Special Flood Hazard Areas, and FEMA's flood maps were brought into the digital age. With the use of Geographic Information Systems (GIS), the new maps use areal imagery and other graphics to communicate flood risks. All of Nevada's counties, except Esmeralda, have or will have Digital Flood Insurance Rate Maps (DFIRMS) shortly. These products are a great tool for flood risk assessment and identifying areas of mitigation interest. In RiskMAP, the vision is to deliver quality data that increases public awareness and leads to action that reduces risk to life and property. Much of the emphasis of RiskMAP is on supporting local communities' planning actions that mitigate flood risks.

Flooding caused by dam failure is a special category described in the section below.

3.3.8 Flooding due to Dam Failure

3.3.8.1 *Nature*

Figure 3-16. Location of Some of Nevada's Larger Dams.
Courtesy of U.S. Department of Interior/Bureau of Reclamation

Dam failures involve unintended releases or surges of impounded water resulting in downstream flooding. The high-velocity, debris-laden wall of water released from dam failures results in the potential for human casualties, economic loss, lifeline disruption, and environmental damage. Dam failures may involve either the total collapse of a dam, or other hazardous situations such as damaged spillways, overtopping from prolonged rainfall, or unintended consequences from normal operations. Severe storms with unusually high amounts of rainfall within a drainage basin, earthquakes, or landslides may cause or increase the severity of dam failure.

Factors causing dam failure may include natural or human-caused events, or a combination of both. Dam failures usually occur when the spillway capacity is inadequate and water overtops the dam. Piping, when internal erosion through the dam foundation occurs, is another factor in a dam failure. Structural deficiencies from poor initial design or construction, lack of maintenance or repair, or gradual weakening from aging are factors that contribute to this hazard.

Many dams in Nevada suffer from encroachment of development onto the potential floodplains below dams. As a result, many dams fail to pass the Inflow Design Flood (IDF) inspection commensurate with their hazard potential and size (Association of State Dam Officials, 2002).

3.3.8.2 *History*

In Nevada history, there have been no incidents resulting in dam failure emergency or disaster declarations; however, there have been some dam failure incidents recorded, listed below in Table 3-18:

Table 3-18. Chronology of Dam Failure in Nevada

Date	Location	Description	Estimated Losses
April 25 1876	Humboldt River Basin	Failure of an irrigation dam across the Humboldt River at Shoshone Canyon, about 22 miles east of Battle Mountain near present-day Dunphy resulted in a huge volume of water rushing through the canyon and flooding several ranches in the river bottom below.	No figures available
January-May 1881		Sustained rains on heavy winter snow pack caused extensive localized flooding. All reservoir dams along Kelly Creek and in Squaw Valley were completely destroyed and were never rebuilt. Mines were flooded, mill dams and roads were washed out, bridges were damaged and livestock drowned.	No figures available

Table 3-18. Chronology of Dam Failure in Nevada			
Date	**Location**	**Description**	**Estimated Losses**
June 27 1883	Humboldt River Basin	The last remaining dam on the Humboldt River at Lovelock broke leaving a number of the largest ranchers without irrigation water.	No figures available
May-June 1884	Humboldt River Basin	Rapid snow melt and heavy spring rains caused an extensive period of wet-mantle flooding in the Humboldt River Basin and its tributaries. Flooding along the lower Humboldt formed a vast lake extending over thirty miles from Beowawe to Battle Mountain, covering the railroad track and damaging the road bridge across the Humboldt River in Battle Mountain. Later in June, the dam at the Humboldt dike outflow of the Humboldt River and Toulon Lakes, was blown up by local ranchers after which it was never rebuilt.	Few records of damage are available.
May 1906	Humboldt River Basin	Heavy rainfall caused the failure of a reservoir dam with six deaths resulting. Various structures were damaged and horses and mules died. Southern Pacific railroad tracks were undermined.	Six lives were lost. No figures available on other losses.
March–June 1932	Humboldt River Basin	Rapid heavy snowmelt caused flooding in the Humboldt River Basin, especially in Lovelock Valley. The Big Five Diversion Dam was washed out (damaged earlier in 1910 and 1914)	No figures available
December 1937	Carson River Basins	Heavy rain on snowpack from December 9 through December 13 caused flooding. On the East Fork Carson River, the Douglas Power (Rithenstrothf) Dam was severely damaged. In the south end of Carson Valley near Gardnerville, the flood on the East Fork Carson River crested at 10,300 cfs late in the afternoon of December 11.	No figures available
December 1955	Truckee, Carson and Walker River Basins	Intense late December storm dropped 10 to 13 inches of rain that melted snow pack in the Northern Sierra Nevada causing flooding along the Walker, Carson and Truckee Rivers. Derby Dam on the Truckee River east of Vista failed, and Hobart Dam, at the headwaters of Franktown Creek failed and released water that severely damaged U.S. 395.	The estimate of damages in the three river basins was $3,992,000 ($22,327,000 in 1997 dollars). One life was lost.
In 1984	Elko County	The concrete liner of the Bishop Creek Dam in Elko County failed, resulting in a 25	No figures available.

Table 3-18. Chronology of Dam Failure in Nevada			
Date	**Location**	**Description**	**Estimated Losses**
		cubic feet per second seep. The seep eventually removed approximately 800 cubic yards of material from the toe of the dam (Association of State Dam Safety Officials, 2002).	
1985	Olinghouse, near Wadsworth, Washoe County	A mine tailings dam owned by the Olinghouse Mining Company failed from an embankment collapse due to oversaturation in Wadsworth, Nevada. Tailings were reportedly deposited up to 1.5 km downstream.	
2005	Near Panaca, Lincoln County	Rainfall runoff overtopped the Schroeder Dam in Beaver Dam State Park located in eastern Nevada by one foot. The top surface of the dam was not damaged, but the downstream face of the dam was severely eroded. Erosion in several of the gullies may have reached as far as the core material. The dam was an earth-fill dam with a thirty-five foot concrete spillway on the east side. Prior to this event the dam was considered a low-hazard dam. Mitigation at this site is ongoing under declaration FEMA-NV-DR1583.	No estimate of damages given.

Figure 3-17. Schroeder Dam in Beaver Dam State Park, 2005. Erosion cut into the front face of the earthen dam.
Picture courtesy of Nevada Division of Emergency Management.

3.3.8.3 Location, Severity, and Probability of Future Events

The State of Nevada has approximately 600 public and privately owned dams. Many of these dams are dry storm-water detention facilities. About 130 of these dams are rated by the State of Nevada Department of Conservation and Natural Resources as ~~"~~High Hazard."

This hazard classification is based on life and/or property loss potential.

A listing of existing dams by county is found in Appendix G and location of a few major dams is shown in Figure 3-16. The listing includes the national identification number, the state identification number, name, county where it is located, legal description, height, normal storage, tributary area, owner, hazard rating, written emergency action plan (EAP), and date of last inspection. The information was obtained through the Nevada Department of Conservation and Natural Resources, Division of Water Resources website http://water.nv.gov/Engineering/Dams/Dam_Query.cfm. Hazard designations for dams are assigned based on downstream hazard potential in the event of a dam failure (NAC 535.140). A high hazard designation (H) is assigned to a dam if there is reasonable potential for loss of life and/or extreme economic loss. A significant hazard designation (S) is assigned to a dam if there is a low potential for loss of life but an appreciable economic loss. Lastly, a low hazard designation (L) is assigned to a dam if there is a vanishingly small potential for loss of life and the economic loss is minor or confined entirely to the dam owner's own property. These hazard designations are initially determined at the time dam design plans are reviewed, however, hazard designations can and do change as downstream conditions alter as a result of development and with the aging of the dams and levees.

The hazard designation is not dependent on type of dam and in no way reflects the safety or condition of the dam.

In 2007, the NHMP Subcommittee sent out a hazard mitigation survey to the counties and tribal entities to collect data on dam failure hazard. All counties except Esmeralda and Nye have at least one dam that is considered high hazard.

In its hazard mitigation plan, Esmeralda County does not list dam failure as a potential hazard of consideration. In their hazard mitigation surveys and/or county hazard mitigation plans, Eureka, Clark, and Douglas considered this hazard as low risk. Clark County has over 90 dry storm water detention facilities to help with flash floods. Churchill and Storey Counties consider the hazard of failing dams as medium risk. Churchill County mentioned that the Lahontan Dam is aging. This dam is watched closely by Churchill County officials. Elko lists dam failure as a moderate hazard with Bishop Creek Dam as their main concern.

Washoe County, in its 2005 hazard mitigation plan, lists dam failure as a high hazard and includes inundation maps due to possible failure of the Boca and Stampede Dams on the Truckee River upstream in California.

In the tribal hazard mitigation surveys, Duck Valley Indian Reservation and the South Fork Indian Reservation consider the hazard of dam failure a low risk. On the Wildhorse Reservation, there is a 38-year old dam that is in good condition. On the South Fork Indian Reservation, there is a diversion dam for irrigation. The Elko band did not consider dam failure as a hazard to their community.

In the 2004 plan, the steering committee recognized the WMD/Terrorism threat rating to all dams (including Hoover and Davis Dams) as potential terrorist targets. The Bureau of Reclamation, Lower-Colorado Region considers the following factors in declaring an emergency at Hoover Dam:

- Structural or slope stability problems during a post-earthquake inspection

- Identification of new cracks or settlement, abnormal seepage
- Instrumentation readings outside of normal range limits
- Potential landslides in the vicinity of the dams or appurtenant structures
- A situation at Hoover Dam in which the average daily water releases exceed 19,000 cubic feet per second for 30 days or more
- A situation where Lake Mead is expected to reach elevation 1219.61 feet (top of joint use) and the National Weather Service forecasts heavy rain or runoff.
- A situation where an earthquake occurs with a magnitude of 3.9 (Richter-Scale) or greater occurs within a distance of 15 miles from the dam.
- A situation wherein a technological (man-caused) emergency occurs within the vicinity of the dam that would impact normal dam and/or power plant operations. Such emergencies could include a facility fire, explosion, terrorist incident, hostage situation or toxic spill on the highway or dam crest.
- A situation wherein Glen Canyon Dam has an unusual event that impacts the structural integrity of the Hoover Dam or power plant.

Flooding due to dam failure is considered a ~~"h~~high hazard." The hazard itself is difficult to quantify because dams could fail from earthquakes, excessive rainstorms, landslides, or human-induced factors. But the consequences can be severe on a local level.

At this time, the Division of Water Resources is in the process of developing emergency plans for all ~~"h~~high" and ~~"s~~significant" hazard rated dams in the State. Action items from these plans will be incorporated into this Plan upon their completion. The representatives on this subcommittee expect to increase the capability to mitigate these hazards by greater coordination between the Division of Water Resources, the Division of Emergency Management, Nevada Department of Transportation, and Nevada State Public Works. Additionally, it is anticipated that there will be greater opportunity to leverage funding from existing resources. The State of Nevada supports the Division of Water Resources efforts in mitigation action items related to this hazard.

3.3.9 Flooding Along Irrigation Ditches and Canals

3.3.9.1 *Nature*

Figure 3-18. Flooded Intersection in a Residential Area of SW Reno. Flooding was caused by overflow of Last Chance Ditch in 2006.

Most flooding occurs along canals and ditches in areas not mapped or designated by FEMA as floodplain because the canals and ditches are not natural waterways, but manmade waterways. Most canals and ditches in Nevada were constructed in the late 1800s and early 1900s to deliver agricultural water from Nevada's few rivers to otherwise dry farms and ranches located at some distance from those rivers. Since that time, urban expansion has extended to areas adjacent to these irrigation ditches such that in some places they are now surrounded by residential, commercial, industrial, and other development. In some cases, buildings have been built immediately adjacent to ditches and are often at elevations lower than the elevations of the ditches. The ditches are generally operated for several months of the year from spring to early fall, often coinciding with times of heavy rainfall and runoff that exacerbate flooding.

A listing of most ditches and canals in Nevada and their county and topographic quadrangle is shown in Appendix R and available online at this link:

http://nevada.hometownlocator.com/features/cultural,class,canal,startrow,1.cfm

Failure of canals and ditches can be aggravated by any of the following factors acting individually or in combination:

- Structural weakness of levee walls
- Overwhelming by excess storm water runoff
- Strong earthquake shaking

- Rodent burrowing
- Diversion of river water into ditches during storms
- Clogging with debris

Canal and ditch failures can lead to inundation of homes and businesses as well as damage to personal property, such as parked cars, stored motor homes and warehoused materials. Infrastructure damage can include roads and utilities, as well as the structural damage to the canal or ditch itself. In some cases, the flooding can be deep and fast enough to endanger the lives of people who are caught in it or who might attempt to cross flooded areas.

3.3.9.2 *History*

There have likely been many breaks in ditches and canals in Nevada that were unrecorded because there were few people to witness or little property that was damaged. Most damage has been caused by severe storms, but some canal failure has been documented by strong shaking from earthquakes.

Storm runoff into a canal can quickly increase hydraulic loads and potentially overwhelm its water-carrying capacity. The rapid increase in storm water can find the weaker parts of a canal embankment, potentially causing them to fail. Rodent burrowing was a contributing factor in weakening the canal embankment that failed after heavy rains on January 5, 2008 in Fernley and flooded 800 homes. This canal failure resulted in a presidential disaster declaration.

Strong ground motion or surface rupture from earthquakes can also damage and fail canal embankments. In the July 6, 1954 Rainbow Mountain earthquake near Fallon, canal embankments liquefied and flowed into the canal and several breaches also occurred to embankments in the canal system (Steinbrugge and Moran, 1956). During the April 25, 2008 Mogul earthquake, an elevated section of the Chalk Bluffs Ditch was collapsed by a rockslide. Fortunately, the water flowed into a small runoff channel and away from homes in the immediate area. There are sparse records of flooding associated with canal and ditch failure; some instances are listed in Table 3-19.

Table 3-19. Nevada Canal and Ditch Flood History

Date	Location	Description; injuries; damage cost
6-Jul-1954	Fallon, NV	Canal damage caused by earthquake; embankment failures; 0 injuries; ~$1M estimated cost
1-Jan-1997	Reno, NV	At least 5 washouts of ditch; 0 injuries; no estimates of cost
31-Dec-2005	Reno, NV	Emergency declaration; Multiple canal breaks and houses flooded;0 injuries; no estimates of cost
5-Jan-2008	Fernley, NV	800 homes flooded; >1500 people evacuated;0 injuries;

Table 3-19. Nevada Canal and Ditch Flood History		
Date	**Location**	**Description; injuries; damage cost**
25-Apr-2008	Mogul, NV	Canal damage caused by earthquake; 0 injuries; $1.8M cost
11-Jun-2008	Fernley, NV	Disaster declaration 1738; Substantial damages; 0 injuries; Approximate cost $3.5M

3.3.9.3 *Location, Severity, and Probability of Future Events*

Generally, the greatest hazard from canal and ditch flooding is in developed areas, although damage to an important roadway in a rural environment can have serious consequences as well. Flooding in open fields or on agricultural lands is usually limited to economic loss of crops or livestock. Within developed areas, the most vulnerable structures are those closest to the canals or ditches, in potential flood paths, or where flooding may be concentrated. Within areas of dense building development, flooding will commonly follow the relatively unrestricted roadways. Where the flood can spread out, become shallower in water depth, and have a lower flow velocity, the hazard and severity decreases. Areas that can be the most severely affected occur where canal or ditch flow can join other water flow, such as at stream channel intersections.

The probability of flooding from canals and ditches is largely tied to large storm events, occurrence of local earthquakes, and to development adjacent to ditches and canals. The probability of recurrence is likely based on historical events, unless mitigation activities such as new codes and regulations for land use planning are successful in restricting new development in flood-prone areas adjacent to ditches and canals.

In the western United States, climate change has led to warmer overall climate conditions compared to what has been observed in the past, with the trend is expected to continue. Nevada will likely see more frequent flooding events under a warmer climate, as snow levels on average, will be higher during winter storms, resulting in more precipitation falling as rain over river basins. This will allow much larger portions of river basins to contribute to runoff, leading to higher flows resulting in more frequent flooding events. In addition, warmer air can hold more moisture (water vapor) which can potentially be converted into heavy precipitation, making flood events more extreme in the future.

3.3.10 Hail and Thunderstorms (Low Risk)

Appendix K contains a summary by county of damage-causing storm events prepared by the Nevada Climate Office with damage costs.

3.3.10.1 *Nature*

Thunderstorms are formed from a combination of moisture, rapidly rising warm air, and a force capable of lifting air, such as warm and cold fronts or a mountain. A thunderstorm can produce lightning, thunder, and rainfall that may also lead to the formation of tornados, hail, downbursts, and microbursts of wind. Thunderstorms may occur singly, in clusters, or in lines. As a result, it is possible for several thunderstorms to affect one location in the course of a few hours.

Figure 3-19. Thunderstorms across the Sierra Nevada. *Picture from NASA.*

Thunder and lightning are most commonly associated with thunderstorms. Lightning occurs when the rising and descending motion of air within clouds produces a separation of positively and negatively charged particles. This separation produces an enormous electrical potential both within the cloud and between the cloud and the ground. Lightning results as the energy between the positive and negative charge areas is discharged. As the lightning channel moves through the atmosphere, heat is generated by the electrical discharge to the order of 20,000 degrees (three times the temperature of the sun). This heat compresses the surrounding clear air, producing a shock wave that decays to an acoustic wave as it moves away from the lightning channel, resulting in thunder.

In addition, hail can occur as part of a severe thunderstorm. Hail develops within a low-pressure front as warm air rises rapidly in the upper atmosphere and is subsequently cooled, leading to the formation of ice crystals. This cycle continues until the hailstone is too heavy to be lifted by the updraft winds and falls to the earth. The higher the temperature at the earth‘s surface, the stronger the updraft, thereby increasing the amount of time the hailstones are developed. As hailstones are suspended longer within the atmosphere, they become larger. Other factors impacting the size of hailstones include storm scale wind profile, elevation of freezing level, and the mean temperature and relative humidity of the downdraft air.

Also, downbursts and microbursts are also associated with thunderstorms. Downbursts are strong, straight-line winds created by falling rain and sinking rain that my reach speeds of 125 miles per hour (mph). Microbursts are more concentrated than downbursts, with speeds reaching up to 150 mph. Both downbursts and microbursts can typically last 5 to 7 minutes. Microburst wind gusts of 50-70 mph are very common with Nevada thunderstorms due to the extremely dry lower layers near the surface being able to evaporate precipitation, creating strong winds.

By far the greatest threats imposed by thunderstorms in Nevada are the associated lightning-caused wildfires and flash flooding due to cloudbursts. These risks are more completely discussed in the sections on Flood and Wildfire.

3.3.10.2 *History*

In Nevada, thunderstorms usually occur from the spring to the fall. The most dangerous thunderstorms are during the summer due to the low humidity and high lightning potential.

Table 3-14 in the flood section shows that much of the historic flooding in Las Vegas Valley was caused by thunderstorms and cloudbursts. This is not unique to the Las Vegas Valley, but true for the entire state.

Table 3-20 below documents the various effects that some thunderstorms have had in recent years on the State of Nevada:

Table 3-20. Significant Nevada Hail and Thunderstorm Events, 2001-2012

Date	Event
August 9, 2001	The Federal Emergency Management Agency (FEMA) authorized the use of federal funds today to help Nevada fight the uncontrolled lightning-caused Antelope fire burning in Washoe County. The state's request for federal fire suppression assistance was approved immediately after the blaze threatened farm areas and 150 homes in the Antelope Valley subdivision located about eight miles northwest of Reno. The fire started by lightning burned 800 acres of land and forced the evacuation of 100 people at the time of the request.
July 12-13, 2002	Numerous high wind and downburst reports in western NV with areas of blowing dust.
August 2, 2002	Thunderstorm-induced flash floods over parts of Reno, and near Virginia City and Dayton.
June 26, 2006	Elko - A lightning storm touched off at least nine fires in northeastern Nevada, forcing interstate closures and threatening the small ranching community. A wildfire about 20 miles west of Elko burned about 5,000 acres, while another blaze had scorched about 3,000 acres northeast of Elko and forced residents in nearby Elburz to evacuate. Two sections of Interstate 80 were closed as a result.
July 10, 2011	A severe thunderstorm developed near downtown Las Vegas and moved through North Las Vegas. The ASOS at North Las Vegas Airport (KVGT) measured a gust to 64 mph. At least two trees were blown down, one onto a house; numerous power poles and lines were blown down; and one child suffered minor injuries when part of a roof blew off an apartment building, flew into the building next door, and broke two windows and damaged four doors.
September 30th, 2011	Lightning-caused wildfires burned about 205,000 acres and threatened the towns of Tuscarora and Midas. An unspecified number of cattle and horses were lost as well as a recreational vehicle.

These anecdotal reports are not isolated unusual events but common occurrences representative of daily or weekly summer weather in Nevada. The data provided in Table 3-21 below by the State Climatologist demonstrate the common frequency of thunderstorms in Nevada. The complete report is contained in Appendix K.

Table 3-21. County Thunderstorm Historical Data

County	Average number of thunderstorms per year
Carson City	No data
Churchill	19
Clark	26

Table 3-21. County Thunderstorm Historical Data	
County	**Average number of thunderstorms per year**
Douglas	No data
Elko	38
Esmeralda	No data
Eureka	No data
Humboldt	12
Lander	23
Lincoln	No data
Lyon	No data
Mineral	No data
Nye	42
Pershing	10
Storey	No data
Washoe	20
White Pine	57

3.3.10.3 *Location, Severity, and Probability of Future Events*

The location and frequency of this hazard by county were compiled by the State Climatologist and are summarized in Table 3-21 with the full report shown in Appendix K. Based on these data of past occurrences, the probability of future events in all locations in the state is high.

Hazards directly associated with hailstorms and thunderstorms were considered by the Subcommittee to be a ~~L~~low Risk" hazard. Although these events are common, their consequences are usually concentrated in small areas and don't affect enough people to normally warrant a request for federal assistance, unless they start fires or cause floods.

The probability of future events for this hazard overall is high. Many if not most of Nevada's flash floods and wildfires are caused by thunderstorms throughout the State. These hazards are covered in their respective sections in this report. Hailstorms are not as high a threat in the State and are generally very localized. NDOT report that as the transportation infrastructure within the state is rather robust, weather- related events such as severe thunderstorms and hail do not generally have much effect on the state highway system; such weather events may cause temporary closures, but generally do not cause damage. An exception is severe flooding, which may be caused by such a weather event, which can cause significant damage to roads, rail, airports, etc.

It is unclear how climate change will affect severe weather related to thunderstorms in the future. Warmer temperatures would lead to more energy to fuel thunderstorms, but this would be countered with lower overall humidities, which limits thunderstorm potential. Thunderstorms that do develop would likely have greater downburst wind potential due to greater evaporative cooling in the lower levels to promote strong winds.

3.3.11 Hazardous Materials (Medium/Significant Risk)

3.3.11.1 *Nature*

Hazardous materials include thousands of substances that pose a significant risk to humans. These substances may be toxic, reactive/oxidizer, corrosive, flammable/combustible, radioactive, or explosive. A release or spill of a hazardous material can pose a risk to any or all of the following receptors: human health, property, or environment. Incidents involving hazardous materials can result in the evacuation of a few people to entire communities, and costs associated with hazardous materials releases can easily run into millions of dollars for damages and cleanup.

Nevada Administrative Code (NAC) 445A.3454 definition of a hazardous substance:

"Hazardous substance" includes, without limitation, any of the following:

1. A contaminant as defined in NRS 445A.325;
2. A hazardous material as defined in NRS 459.7024;
3. A hazardous substance as defined in 40 C.F.R. Part 302;
4. A pollutant as defined in NRS 445A.400; and
5. A regulated substance as defined in NRS 459.448.

Nevada Revised Statutes define a Hazardous Material as any substance or combination of substances, including any hazardous material, hazardous waste, hazardous substance or marine pollutant:

1. Of a type and amount for which a vehicle transporting the substance must be placarded pursuant to 49 CFR Part 172;
2. Of a type and amount for which a uniform hazardous waste manifest is required pursuant to 40 C.F.R. Part 262; or
3. Which is transported in bulk packaging, as defined by 49 CFR § 171.8

Source: Nevada NRS and NAC as identified above.

In Nevada, hazardous materials are regulated by numerous Federal, State, and local agencies including the U.S. Environmental Protection Agency (EPA), U.S. Department of Transportation (DOT), Occupational Safety and Health Administration (OSHA), National Fire Protection Association, FEMA, U.S. Army, International Maritime Organization, Nevada State Fire Marshal's Office, Nevada State Emergency Response Commission, Nevada Division of Environmental Protection and Nevada Counties and Cities.

Applicable Federal Laws include the Comprehensive Environmental Response, Compensation, and Liability *Act (CERCLA) of 1980,* Superfund and Reauthorization Act (SARA) (amendment to CERCLA) of 1986, Resource Conservation and Recovery Act of 1976, Hazardous Materials Transportation Act (HMTA) of 1975, Occupational Safety and Health Act (OSHA) of 1970, Toxic Substances Control Act (TSCA) of 1976, Clean Air Acts of 1955-1990, Clean Water Act of 1972.

Unless exempted, facilities that use, manufacture, or store hazardous materials in the United States fall under the regulatory requirements of the Emergency Planning and Community

Right to Know Act (EPCRA) of 1986, enacted as Title III of the Federal Superfund Amendments and Reauthorization Act (42 USC 11001-11040; 1988). Under EPCRA regulations, hazardous materials that pose the greatest risk for causing catastrophic emergencies are identified as Extremely Hazardous Substances (EHS). These chemicals are identified by the EPA in the *List of Lists – Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-to-Know Act (EPCRA) and Section 112 of the Clean Air Act.*

In addition to accidental human-caused hazardous material events, natural hazards may cause the release of hazardous materials and complicate response activities. The impact of earthquakes on fixed facilities may be particularly serious due to the impairment or failure of the physical integrity of containment facilities. The threat of any hazardous materials event may be magnified due to restricted access, reduced fire suppression and spill containment, and even complete cut-off of response personnel and equipment. In addition, the risk of terrorism involving hazardous materials is considered a major threat due to the location of hazardous material facilities and transport routes throughout communities.

On behalf of several Federal agencies including the EPA and DOT, the National Response Center (NRC) serves as the point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment within the United States.

NDEP operates and maintains a 24- hour Spill Reporting Hot Line. Hundreds of calls are received every year. Most of the reports received are routine in nature and are addressed during business hours by the appropriate oversight agency. Reports of releases requiring more immediate action are referred to an Environmental Assistance Coordinator who can provide technical information to responders and represent the State on-scene, when necessary. Clean-up oversight of chemical-impacted sites is handled by NDEP Case Officers.

3.3.11.2 Identification of Hazardous Materials Releases

Hazardous material releases can occur from the following:

1. Fixed site facilities such as chemical plants, storage facilities, manufacturing facilities, warehouses, mine sites, water and wastewater treatment plants, swimming pools, dry cleaners, automotive sales/repair sites, and gas stations. In Nevada, the Department of Conservation and Natural Resources, Division of Environmental Protection (NDEP), the State Fire Marshal‘s Office and the State Emergency Response Commission (SERC) share responsibility for regulating hazardous materials. The State Fire Marshal and the SERC have a combined database that stores data about fixed facilities with hazardous materials meeting: a) the most current International Fire Code, and/or b) the EPCRA requirements. The total number of permitted/reported fixed facilities in Nevada is 5,862. The EPCRA facilities with highly hazardous/extremely hazardous substances total 1,587. Fees are imposed on EPCRA fixed facilities for planning, training and equipment of first responders. The funding is managed by the SERC who provides grants to the local emergency planning committees (LEPCs). Each LEPC develops and annually reviews a hazardous materials response plan and provides updates. The plans and updates are reviewed annually by the SERC‘s standing Planning and Training Subcommittee. Each plan must be approved in order to receive operating funds and

grants from SERC. NDEP is the responsible state agency for the maintenance of the State Hazardous Materials Response Plan as well as for the response to hazardous materials spills

2. All transportation including highway, rail and air. Figure 3-20 shows highway and rail routes. For a listing of annual Nevada highway incidents, see Table 3-22. Some special transport cases specific to Nevada are listed below:

    - Proposed nuclear transportation to Yucca Mountain (currently tabled but may come up again in future administrations)
    - Waste Isolation Pilot Project transportation of transuranic waste in and through Nevada
    - Transportation storage of Department of Energy elemental mercury stockpile at the Hawthorne Army Base in Hawthorne Nevada.

3. Pipeline transit of liquid petroleum, natural gas, or other chemicals

4. Non-terrorist related intentional or accidental acts that result in the release of a hazardous material by private persons or groups. Examples include clandestine methamphetamine laboratories and hazardous materials released in private and public setting

5. Terrorist-related acts resulting in the release of chemical, biological, radiological, nuclear, or explosive materials (CBRNE) (See profile section 3.3.15 on Terrorism/WMD)

6. Historic release sites. Examples include the Sparks solvent fuel site in Washoe County, BMI Complex in Clark County, perchloroethylene (PCE) plumes in Washoe and Clark counties, and the Hawthorne Army Depot in Mineral County.

7. Naturally occurring geological formations containing potentially hazardous substances. An example is erionite an asbestos-like substance. Erionite is discusses in detail below

8. *Superfund Site:* Carson River Mercury Site *(CERCLA/*SARA National Priority Listed Site).

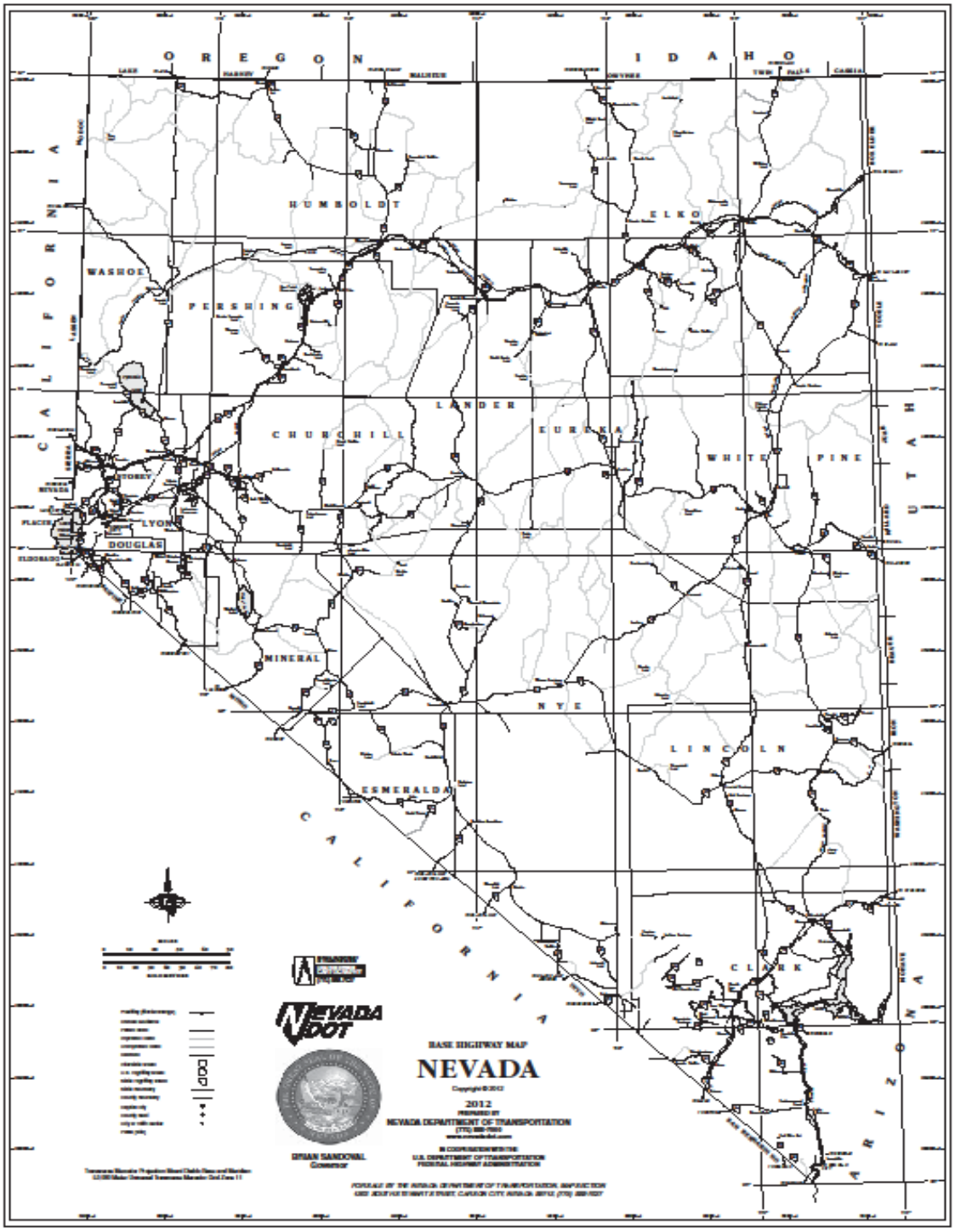


Figure 3-20. Map of Nevada Showing Major Transportation Routes Including Highway and Rail.

The online link to this map is:
http://www.nevadadot.com/uploadedFiles/NDOT/Traveler_Info/Maps/Base%20Map%202012%20(17%20x%2024).pdf

The following are additional national statistics of interest compiled for the Federal Motor Carrier Safety Administration (2001):

- Hazmat shipments make up between 4 percent and 6 percent of all shipments.
- The average cost of a hazmat accident, both release and non-release, was estimated at $414,000.
- The average cost of a non-hazmat accident was estimated at $334,000.
- Class 3 shipments (flammable and combustible liquids) account for 64 percent of the *en route* accidents involving releases and about 52 percent of the non-release accidents.
- Class 3 and Class 8 shipments (corrosive materials) are involved in about 77 percent of all *en route* leaks per year.
- Class 3 and Class 8 shipments were also involved in about 84 percent of all loading and unloading incidents.

Source of statistics from "Costs of Hazmat Accidents" http://enviro.blr.com/display.cfm/id/73049

3.3.11.3 *History*

Hazardous material events are no longer unusual in Nevada. See 3-23 and Table 3-24 for an enumeration of hazardous material event spill calls from 2000 through December 2012. This type of event should be planned for due to the amount of hazardous materials located in, and shipped through the State. Additional reasons for the State of Nevada to be prepared for hazardous material events are the proposed nuclear waste facility in Yucca Mountain, the transportation of transuranic waste into and through the State, and the ongoing production, transportation, and storage of elemental mercury.

Table 3-22 below lists the number and location of highway accidents involving Hazardous Materials from January 2010 through December 2012 on Nevada highways as recorded by NDOT.

Table 3-22. Nevada Highway HAZMAT Incidents from January, 2010 through December, 2012			
***County*/Street**	**# of Events**	***County*/Street**	**# of Events**
CLARK		***LINCOLN***	
Surface streets	35	US93	1
Interstate 15	14	SR318	1
Interstate 215	3	***LYON***	
SR 169	1	US50A	4
SR163	1	US50	1
SR171	1	***MINERAL***	
SR582	1	SR360	1
SR604	2	SR839	1
US 95	5	US93	2
US 93	1	***NYE***	
DOUGLAS		SR 160	1
US 50	1	SR372	1
ELKO		US95	1
Interstate 80	8	***PERSHING***	
SR227	1	Interstate 80	3
SR225	2	***WASHOE***	
US93	2	Interstate 80	8
EUREKA		US 395	1
Interstate 80	2	Interstate 580	6
US 50	2	Moana Lane	1
HUMBOLDT		***WHITE PINE***	
Interstate 80	1	SR318	1
LANDER		US 6	1
Interstate 80	2	US 50	1
SR306	2	US 93	1
Source: Nevada DOT: crashinfo@dot.state.nv.us			

Table 3-23. Nevada Spill Calls By Year, 2000-2012

Year	Total Spill Reports
2000	520
2001	447
2002	439
2003	465
2004	533
2005	639
2006	640
2007	650
2008	628
2009	487
2010	452
2011	548
2012	566
Total	**7014**

Table 3-24. Nevada Spill Calls by County, 2000-2012

County	Spill Reports 2000-2012
CARSON CITY	204
CHURCHILL	231
CLARK	2759
DOUGLAS	222
ELKO	391
ESMERALDA	23
EUREKA	293
HUMBOLDT	314
LANDER	116
LINCOLN	56
LYON	340
MINERAL	83
NYE	339
PERSHING	72
STOREY	54
WASHOE	1198
WHITE PINE	125

The following hazardous materials events were chosen to represent the various types of incidents which have occurred in Nevada. These events help illustrate the hazards Nevada may face in the future. This list is not intended to be comprehensive. These events have been divided into two types: **Discovery event**: a historic or otherwise unobserved, release that is inferred to have occurred based on the discovery of contaminated soil or groundwater. A reporting determination is based on the magnitude and extent of discovered contamination. **Contemporaneous event**: a release that occurs in real-time that is observable or measurable such that a reporting determination can be made based on the volume or quantity of the hazardous substance released.

Source: http://ndep.nv.gov/bca/cem/cover.htm

Discovery Event Releases:

Carson River Mercury Site/Superfund Act Site

Mining and milling operations commenced in the Carson River drainage basin associated with Storey and Lyon Counties in approximately 1850 when placer gold deposits were discovered near Dayton at the mouth of Gold Canyon. Throughout the 1850s, mining consisted of working placer deposits for gold in Gold Canyon and Six Mile Canyon. These ore deposits became known as the Comstock Lode. Prior to 1900, the primary method of

retrieving gold from ore was accomplished by amalgamating the gold with elemental mercury. Over 200 mill sites used the mercury amalgamation process during the Comstock era, which resulted in the release of mercury into the creeks, canyons and river system associated with the area. Elevated mercury levels were discovered in the Carson River in the early 1970s. The Carson River Mercury Site (CRMS) was added to the National Priority List (NPL) in August of 1990 under CERCLA (Superfund Act). The CRMS is Nevada's only NPL site under direct control of the Environmental Protection Agency (EPA). It has been estimated that as much as 15,000,000 pounds of mercury were released to the environment in the Carson River drainage.

Assessment and mitigation of specific areas within the CRMS were completed by the EPA in the late 1990s. Mercury-impacted soil above the action limit of 80 parts per million was removed in select locations from the ground surface to a depth of two feet to lower the risk of exposure to humans. New housing and business developments in medium to high risk areas within the CRMS are responsible for assessing the mercury levels in soil prior to development. The Nevada Division of Environmental Protection (NDEP) is responsible for working with the developer to lower the risk of mercury exposure through sampling and analysis plans and mitigation, if necessary.

Many areas in the CRMS have yet to be characterized. EPA, in cooperation with Local and State governments, require the collection of baseline environmental data prior to the development of the land. NDEP provides guidance to property owners or developers on how to conduct such an assessment. The results of these assessments allow for educated decisions to be made with regard to the need for clean-up of the site to protect future users of the site.

Source: *http://ndep.nv.gov/bca*

BMI Complex

Starting in 1941 when the federal government leased 5,000 acres of vacant desert in the southeastern part of the Las Vegas Valley in what is now Henderson to a magnesium manufacturer, the site now know as the BMI Complex was home to a number of various industrial, government and business entities primarily involved in the production of chemicals and products containing chemicals.
During the years these facilities operated, these plants produced a variety of industrial and municipal effluents that were historically disposed of on-site in unlined evaporation ponds, transported off-site via ditches, or disposed of on the land surface. A long term clean-up of the site under the direction of NDEP has been underway since 1979.

Source: http://ndep.nv.gov/bca

Central Truckee Meadows Remediation District and Clark County

In the 1980s, the United States Environmental Protection Agency (EPA) identified perchloroethylene (PCE) as a possible human carcinogen and required municipal water systems nationwide to initiate systematic monitoring for PCE. Locally, the first sampling of drinking water wells in 1987 showed that five of the municipal water supply wells located in the central Truckee Meadows had PCE concentrations exceeding the drinking water quality standard. PCE was used extensively from the 1940s through the

1980s as a product in chemical manufacturing, as a cleaner/degreaser by automotive repair shops, paint shops, machine shops, and dry cleaning businesses. It was later determined that approximately 16 square miles of the Truckee Meadows ground water system is affected and other drinking water wells are threatened. In addition, in Clark County, PCE contamination has also been identified at multiple sites. Assessment and remediation of many of these sites are still in progress with oversight provided by NDEP.

Source: http://ndep.nv.gov/bca

Sparks Solvent Fuel Site

The Sparks Solvent/Fuel Site (SSFS) is a rail yard and fuel terminal tank farm located in Sparks, Nevada. Industrial activities at the site over the past century led to contamination of groundwater and soils by gasoline, solvents, diesel fuels, and other petroleum products. The rail yard was constructed in the late 1800s and has served as a major east-west thoroughfare for railroad traffic since its construction. The site has been used as a refueling and service area for Southern Pacific Railroad since about 1907 and has been a fuel storage and distribution facility since 1957. Current and past operations at the terminal include the storage, distribution, and loading of gasoline, heating oil, diesel fuels, military fuels, and fuel additives.

In mid-1987 the NDEP was informed of the presence of soil and ground water contamination at the fuel terminal tank farm located just south of Interstate 80 in Sparks, Nevada. In November 1988, petroleum hydrocarbon contamination was noted in the Helms Gravel Pit located approximately 4200 feet east of the fuel terminal. It was determined that the contamination in the gravel pit was from the terminal. In 1989, the NDEP issued an order to Santa Fe Pacific Pipeline Partners (now known as Kinder Morgan Energy Partners) to investigate contamination.

In 1991, the terminal and rail yard landowners and tenants began coordinated environmental investigations at the site through the Vista Canyon Group (VCG).

Investigation of soil and groundwater at the SSFS has been ongoing since 1991. Active site-wide remediation began in 1995. Free-phase petroleum product is no longer present at the site. Currently, the primary chemicals of concern are benzene, methyl tert-butyl ether (MTBE), trichloroethylene (TCE), and perchloroethylene (PCE). From 1995 to 2009, approximately 4.8 billion gallons of groundwater have been extracted and treated on site.
Source: http://ndep.nv.gov/bca

Contemporaneous Releases

Table 3-25 below provides data on some significant contemporaneous HAZMAT releases recorded in Nevada from 1988 through 2012.

Table 3-25. Historical HAZMAT Events in Nevada

Date	Location	Details and Damages
May 1988	Henderson	The PEPCON facility exploded when a welding operation started a fire. The fire spread to AP storage an oxidizer for solid rocket propellant. The explosion resulted, in two deaths, 372 injuries and damage to 7,000 homes and businesses. Damages estimated at 100 million dollars.
May 1988	Las Vegas	Union Pacific Railroad Company found a leak from a tank car filled with sulfuric acid from the Kennecott Corporation in Garfield, Utah. Due to this incident, Union Pacific incorporated a hazmat reporting structure for their officers and employees.
May 1991	Henderson	A massive leak of liquefied chlorine at Pioneer Chlor-Alkali Company created a cloud of poisonous gas over the city of Henderson, Nevada. Over 200 persons were examined at a local hospital for respiratory distress caused by inhalation of the chlorine and approximately 30 were admitted for treatment. Approximately 700 individuals were taken to shelters. It is estimated that from 2,000 to 7,000 individuals were taken elsewhere.
January 1998	Kean Canyon 10 miles east of Reno	January 7, 1998, two massive explosions just seconds apart destroyed the Sierra Chemical Company's Kean Canyon explosives manufacturing plant ten miles east of Reno, Washoe County, Nevada, killing four workers and injuring six others. For details, see U.S. Chemical & Safety Hazard Investigation Board report on Sierra Chemical Company explosion at http://www.csb.gov/completed_investigations/docs/CSB_Sierra.pdf
July 2000	Dayton	An explosion of hydrogen trifluoride gas seriously damaged an industrial plant in Dayton, Lyon County, Nevada.
April 2002	Interstate 80 at the California and Nevada Border	A twenty-one car pileup occurred on I-80 at Union Mills Grade just east of the California Highway Patrol scales. Six big rigs were involved, spreading metal debris, gasoline, and furniture across both lanes of eastbound I-80 traffic.
January 2004	Fernley	There was an evacuation of Fernley's Nevada Pacific Industrial Park in Lyon County, due to a strange vapor emanating from a disposal bin at the Philip Services Corporation (PSC) facility. PSC recycles chemicals including acids, alkaline substances, cyanide, and battery waste. The smoke-like vapor was found to be nontoxic in this incident; however, this situation provides an example of the potential for evacuations due to hazardous materials incidents.
January 2004	Gardnerville	Pau Wa Lu Middle School. A student brought approximately one pound of elemental mercury to the school and shared it with his classmates. 60 students were decontaminated and the School was closed for 14 days while a cleanup was conducted.
June 2004	Interstate 80 California/Nevada	A tractor trailer veered off road five miles east of Truckee, California, the cab of the tractor-trailer engulfed in flames killing the driver and passenger. The trailer portion ruptured, spilling insulating material along the interstate. Although this event occurred outside of Nevada's border, it posed a threat to Nevada due to its location on the highway adjacent to the Truckee River, which is the major supplier of Washoe County's water supply.

Table 3-25. Historical HAZMAT Events in Nevada		
Date	**Location**	**Details and Damages**
February 2006	Southern Nevada Transportation Corridors	A tanker transporting 4,500 gallons of radioactive wastewater from the San Onofre Nuclear Power Plant leaked while *en route* to the disposal site in Utah. This particular tanker's route was through Las Vegas, Nevada. According to the driver, he was unaware of the leak until he stopped at Parowan, Utah.
February 2007	Fernley	A mobile methamphetamine (meth) lab in a suitcase was found off the side of the road in Fernley. There was no danger to the homes 100 to 150 yards away. The DEA hazmat team disposed of the suitcase and its contents. The chemicals used in the production of meth can be toxic, flammable/explosive and corrosive and pose a risk to people and property both during production and after the lab has been vacated due to chemical residues and discarded waste products.
April 2007	Carson City	The Carson City Fire, Sheriff Office and the Quad-County Hazmat Team responded to All Metals Plating facility for the report of an orange gas cloud coming from the facility. A chemical mixing mistake caused a chemical reaction occurred that produced an orange plume of acid vapors that migrated out of the facility. The Plating Shop and adjacent businesses to were evacuated. One employee from the Plating Shop was taken to the Hospital for possible exposure to the vapors. NDEP and EPA Region 9 mobilized to the incident to provide assistance to the Incident Commander. The Quad-County Hazmat Team set up a decontamination corridor and performed an entry into the Plating Shop to collect a sample of the waste mixture to be able to identify the substances involved. An environmental contractor worked with the responders to stabilize the hazardous waste for disposal.
August: 2007	Las Vegas	A rail tanker containing chlorine gas escaped from the Arden train yard outside of Las Vegas. Reaching a speed of approximately 50 mph the tanker traveled through populated areas of Las Vegas and North Las Vegas. No release occurred. However, this incident outlines the danger involved in the transport of an extremely hazardous material through a metropolitan area.
October, 2007	Reno/Sparks	A breach in the high pressure Kinder-Morgan fuel pipeline caused a 35'X100' petroleum impact area with puddles of Jet-A fuel reported. The site is 1,000 feet from the Truckee River. Estimated release amount was 500 gallons.
January 2008	Fernley	Following intense rain and snowmelt, a canal bank gave way flooding a residential portion of the City of Fernley. Local, State and Federal Disasters were declared. Potentially damaged household hazardous material was identified as a potential threat to the community. NDEP, EPA Region IX, the United States Coast Guard and FEMA cooperated to hold a household hazardous waste collection event for the flood-impacted residents.
August 19-20, 2009	Douglas County	NDEP mobilized to a report of a contractor setting blasting charges in boulders along the southeast shore of Lake Tahoe without a blasting permit. Tahoe Douglas Bomb Squad and Fire Department personnel deemed the situation "unsecure" to be left over night due to safety reasons. With permission from the property manager the charges were detonated inside a "substantial" boulder breakwater area. The Tahoe Regional Planning Agency and the Tahoe Douglas Fire Department provided follow up actions.

Table 3-25. Historical HAZMAT Events in Nevada		
Date	**Location**	**Details and Damages**
August 25, 2009	Carson City	Bella Lago Apartment Complex, 1600 Airport Road, Carson City. Initially Fire Dept. was called on report of a mercury discovery beneath carpeting in one apartment of a 20-unit apt. building. 220 tenants were evacuated from the building and Hazmat with oversight from NDEP took over to proceed with cleanup which involved removing both the concrete floor and 20 inches of dirt below it. Ultimately more than 35 pounds of elemental mercury were recovered from the floor and underlying dirt. Cleanup took several months, and high blood mercury levels were measured in many residents of the complex; seven of those individuals received on-going medical treatment for mercury exposure, including several children. Mercury was traced to previous tenant who was probably using it to recover placer gold.
June 2010	Elko County	Tanker truck accident. A tanker truck driver turned too tight around a locomotive, the tanker was breached in the middle and 3,500-4,000 of diesel was released to the ground.
July 2010	Elko County	A two-trailer tanker truck rear tank trailer overturned, caught fire and exploded on Highway 93 causing the closure of the Highway. Approximately 4,500 gallons of gasoline was released to the soil.
August 2010	Churchill County	Approximately 10,000 gallons of hydrochloric acid was released to a chemical room in the City of Fallon New River Water Treatment Plant due to failure of a plumbing fitting during filling of the acid storage tank. The chemical room and an adjacent business were evacuated. An Incident Management Team was activated by the Nevada Division of Emergency Management at the request of the City of Fallon. Both the Washoe County and the Quad-County Hazmat Teams responded to the incident. The hazmat teams, a private hazmat contractor and the City of Fallon worked to pump the acid out of the building. The response lasted five days. The chemical building suffered significant damage. During the response, a temporary water treatment system was set up to provide water to the city.
July 2011	Lincoln County	Tanker Truck Accident. A tanker transporting naphtha (a petroleum hydrocarbon mixture) rolled over, exploded and caught fire near Hiko, Nevada. It was estimated that 8,000 to 9,000 gallons was released. The driver was reported to be injured in the accident.
October 2011	Henderson	Ten to twenty gallons of chlorine gas was released at the Olin Chlor Alkali plant when a plastic vent line pipe ruptured inside the Bleach Production process plant. Four people in the area when the incident happened were taken to the hospital for inhalation of chlorine gas. Olin immediately initiated their Emergency Response Plan: They contacted the adjacent companies alerting them of the release and telling them to shelter in place. Olin's response team went in and made sure the process was isolated and proceeded to mitigate the release. Clark County Fire responded for incident management. Emergency medical response was also requested.
March 2012	Clark County	More than 10 pounds of gas chlorine was vented to the atmosphere at the Titanium Metals Corporation when pH control of the SOX scrubber in the chlorination process was lost.
December 4, 2012	Carson City	An elderly man reported to authorities that he had stored dynamite in the walls of a Bath Street home beginning about 50 years ago. Police discovered many sticks of old dynamite still boarded up behind the garage walls, which were removed and deactivated.

Naturally-occurring potentially hazardous substances:

Naturally occurring potentially hazardous substances may include but are not limited to: erionite, radionuclides, radon, lead, mercury, arsenic, crude oil, selenium, nitrates and sulfur.

Erionite is addressed below. The other substances listed above will be addressed in subsequent updates of the Nevada Hazard Mitigation Plan.

Erionite:

Not all hazardous materials are manmade and not all hazardous events are human-caused. Erionite is a naturally occurring, microscopic, fibrous zeolite-group mineral, with the chemical formula $(Na_2,K_2,Ca)_2Al_4Si_{14}O_{36}•15H_2O$, commonly found in volcanic ash that has been altered by weathering and ground water. It forms brittle, wool-like fibrous masses in the hollows of volcanic rocks. Although erionite is not currently regulated by the U.S. Environmental Protection Agency (EPA) as one of the six asbestos fibers, some properties of erionite are similar to the properties of asbestos and it is known to be a human carcinogen listed by the International Agency for Research on Cancer as a Group 1 Carcinogen. Erionite has been identified as the cause of deaths from mesothelioma in some villages in Turkey (Pratt, 2012). It occurs in Nevada and other western states in altered sedimentary deposits derived from volcanic ash (Papke, 1972; Sheppard, 1996). North Dakota's Department of Transportation has banned the use of erionite gravels on state roads, recognizing that erionite-bearing crushed stone had already been used as aggregate on some dirt roads in the western part of the state.

History

Mesothelioma has been linked to some asbestos minerals, which, like erionite, are fibrous and can form small, breathable dust particles. According to Pratt (2012), ~~h~~high rates of mesothelioma observed among residents of the Turkish villages of Karain, Tuzkoy, Old Sarihidir, Karlik, and Boyali have been related to erionite, not exposure to asbestos." Residents in these villages built homes with volcanic tuff containing erionite. In North Dakota, the U.S. Environmental Protection Agency has been working with state and county officials to minimize the risks to children in areas where erionite-bearing gravel was used at baseball fields, playgrounds, and schools.

Location, Severity and Probability of Future Events

At this time, we are not aware of any use of erionite-bearing crushed stone or gravel in Nevada highways or roads. The Nevada Department of Transportation (Robert Piekarz, personal communication, 15 December 2011) is concerned that individuals testing potential sources of crushed stone or gravel for use in highway construction and repairs may be exposed to erionite. The rocks containing erionite (tuffs and volcaniclastic sediments with high contents of ash) typically are of too low a quality to be quarried or mined for road

construction. The Nevada Hazard Mitigation Planning Committee therefore believes the risk of this hazard in Nevada is low.

Sheppard (1996) summarized the following observations about erionite in Nevada:

—Except for two localities (Figure 3-21, localities 19 and 20) near Beatty, the occurrences of erionite are in the northern and central parts of Nevada. Deffeyes (1959) was first to report that erionite was not as rare as had been previously believed. He documented the common and abundant occurrence of erionite in silicic, vitric tuffs that had been deposited in Cenozoic lakes of central Nevada. Papke (1972) mapped and studied in detail four of the erionite deposits (localities 23, 27, 29, and 30) that had been prospected by several companies, including Union Carbide Corporation, Shell Development Company, and Mobil Oil Corporation. Of all the high-grade erionite deposits in Nevada, only several hundred tons of erionite-rich tuff were mined from Jersey Valley (locality 27) by Mobil Oil Corporation.

Most erionite occurrences in Nevada are in upper Cenozoic tuffaceous, lacustrine rocks. The thickness of the erionite-bearing tuff is less than 1 cm to more than 1 m, and the erionite content ranges from a trace to nearly 100 percent. At Jersey Valley (locality 27), two erionite-rich beds can be traced along strike for about 5.5 km. Most erionite-rich tuff is yellow or light orange. Erionite coexists with analcime, chabazite, clinoptilolite, mordenite, and phillipsite, but the association with clinoptilolite is most common. At the Reese River occurrence (locality 29), some erionite has a woolly appearance (Gude and Sheppard, 1981) and resembles the type erionite from Durkee, Oregon (locality 44). Most erionite from the lacustrine deposits occurs as acicular or prismatic crystals or as bundles or aggregates of radiating acicular crystals.

Ash-flow tuffs at Yucca Mountain (locality 20) and near Fish Creek (locality 28) rarely contain trace amounts of erionite. Erionite has been recognized only in the subsurface at Yucca Mountain. At both localities, the erionite coexists with clinoptilolite."

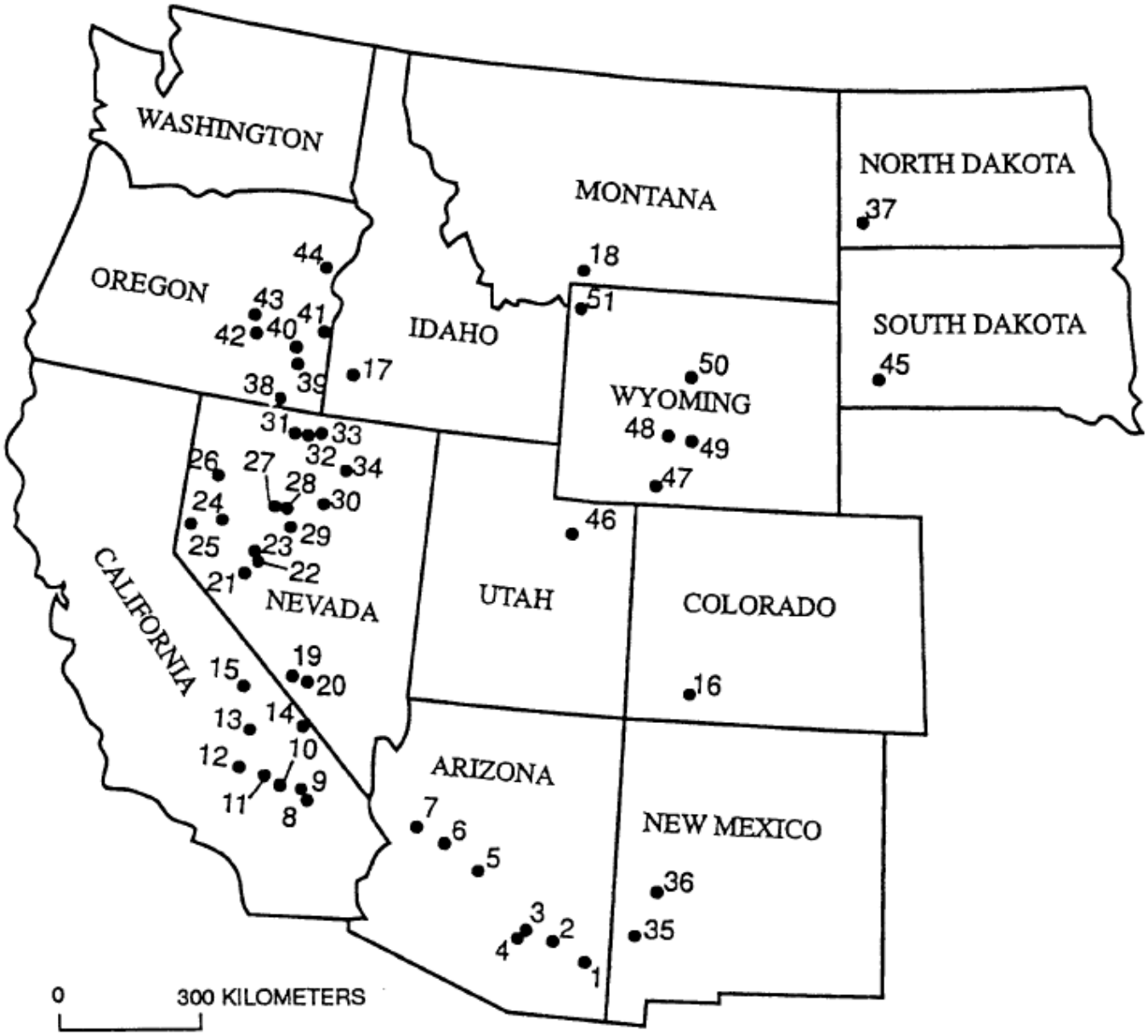


Figure 3-21. Some known Occurrences of Erionite in the Western United States
from Sheppard, 1996

19. Near Beatty, Nye County
20. Drill holes (UE-25a#l, about 395.1 m depth; J-12, about 189.0-192.0m depth; USW G-4, about 400.5 m depth; USW GU-3, about 362.5 m depth) at Yucca Mountain, Nye County
21. Gabbs Valley, northwest of Gabbs, Nye County
22. Southern Desatoya Mountains, Churchill County
23. Near Eastgate, Churchill County (sec. 28, T. 17 N., R. 36 E.)
24. Trinity Range, Churchill County (northeast part of T. 24 N., R. 28 E.)
25. Near Hungary Valley, Washoe County (SW1/4NW1/4 sec. 22, T. 22 N., R. 20 E.)
26. Near Windy Basin, east of Gerlach, Pershing County
27. Jersey Valley, Pershing County (sec. 8, T. 27 N., R. 40 E.)

28. Near Fish Creek, Lander County (NW1/4NW1/4 sec. 10, T. 27 N., R. 41 E.)
29. Near Reese River, Lander County (sec. 26 and 35, T. 24 N., R. 43 E.)
30. Pine Valley, Eureka County (NW1/4 sec. 20 T. 28 N., R. 52 E.)
31. Along Spring Creek, Humboldt County (NW1/4NE1/4 sec. 21, T. 41 N., R. 41 E.)
32. Eastern fork of Chimney Reservoir, Humboldt County (NWl/4SEl/4sec. 17, T. 41 N., R. 43 E.)
33. Along South Fork Little Humboldt River, Elko County (NW1/4NE1/4 sec. 1, T. 41 N., R. 44 E.)
34. Near Susie Creek, Elko County (sec. 6, T. 35 N., R. 54 E.)

References

Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, 2011, Erionite: an emerging North American hazard, http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/, downloaded 23 May 2012.

Deffeyes, K.S., 1959, Erionite from Cenozoic tuffaceous sediments, central Nevada: American Mineralogist, v. 44, p. 501-509.

Papke, K.G., 1972, Erionite and other associated zeolites in Nevada: Nevada Bureau of Mines and Geology Bulletin 79, 32 p.

Pratt, S.E., 2012, Dangerous dust: erionite – an asbestos-like mineral causing a cancer epidemic in Turkey – is found in at least 13 U.S. states: Earth, p. 36-43.

Sheppard, R., 1996, Occurrences of erionite in sedimentary rocks of the western United States: U.S. Geological Survey Open-File Report 96-018.

3.3.11.4 Location, Severity, and Probability of Future Events

The probability of future events for this category is considered high for a number of reasons listed below:

1. As previously mentioned, the U.S. Environmental Protection placed the Carson River on the Superfund National Priority List. As of July 2012 the Carson River Mercury Site is the only site in Nevada under this listing. Mitigation of this site and other ~~H~~historic" release sites are often complex and may take many years to complete. In addition, due to historic hazardous materials practices prior to Federal, State and Local regulations and ordinances, future ~~D~~discovery" events in Nevada are probable

2. The use of State routes and rail routes and to transport hazardous materials cannot be avoided. The Waste Isolation Pilot Program (WIPP) transports transuranic waste through Nevada highway corridors *en route* to other locations in the country In addition, the Nevada Test Site located in Nye County has received a total of 48 shipments at the Nevada Test Site according to the Department of Energy website, www.wipp.energy.gov/shipments.htm.

3. Air transportation of hazardous materials across Nevada cannot be avoided.

4. Approximately 84% of the territory in Nevada is federally managed. Federal land

stewardship can present a challenge to the enforcement of state and local laws.

5. Natural hazards such as earthquakes and flooding are unpredictable and may not only cause releases of hazardous substances, but can also severely complicate response activities.

6. Terrorist acts present an unpredictable threat and could be especially catastrophic due to the locations of facilities that store, transport or manufacture hazardous substances.

7. There are specific hazards posed to the water supplies for the two major population centers, Reno-Sparks (Truckee River) and Las Vegas (Colorado River-Lake Mead) by possible hazardous materials contamination which might actually originate out-of-state in California for the Truckee, Carson and Walker Rivers, and in Arizona for the Colorado River.

8. Hazardous materials releases at natural resource sites. The minerals industry is important in hazardous materials transportation, production and use in Nevada. In 2010, the University of Nevada Reno, Bureau of Mines and Geology reported about 26 active mines, 6 oil fields and 12 geothermal plants statewide. These numbers will not be updated during the update of the 2013 iteration of this plan.

Source: http://www.nbmg.unr.edu/dox/e49.pdf or http://www.nbmg.unr.edu/dox/mi/10.pdf (revised 27 Apr 2012)

9. The volume of hazardous substances stored and manufactured in Nevada communities along with the transport of these substances in, and through the State are factors that help determine the potential release and community exposure to these substances. These factors are variable and make the probability of future releases difficult to predict. However, the number of facilities that store, manufacture and transport hazardous substances is likely to increase in coming years as the population of the State increases and more businesses locate to Nevada. Therefore, the potential of a release of hazardous materials is likely to increase.

3.3.12 Infestation (Low Risk)

3.3.12 .1 Nature

An "invasive species" is defined as a species that is:

1) Non-native (or alien) to the ecosystem under consideration and
2) Whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

Invasive species can be plants, animals (including aquatic species) and other organisms (e.g., microbes). Source: United States Dept. of Agriculture, National Agriculture Library (10/5/2007)

Infestations impact Nevada's economy through the destruction of crops and natural resources which also impacts recreation and tourism. Some of the plant infestations are highly flammable and assist in the spread of wildfires. Human actions are the primary means of introduction and spread of invasive species.

3.3.12.2 *History*

The Nevada Department of Agriculture monitors the introduction and spread of noxious weeds in the state. They have developed a categorization scheme for control of noxious weeds with Category —Cbeing the most widespread and subject to active eradication. Below is the Nevada Department of Agriculture's Nevada Noxious Weed List as designated by application of NRS 555.010.

NEVADA NOXIOUS WEED LIST

NRS 555.130 Designation of noxious weeds. The State Quarantine Officer may declare by regulation the weeds of the state that are noxious weeds, but a weed must not be designated as noxious which is already introduced and established in the State to such an extent as to make its control or eradication impracticable in the judgment of the State Quarantine Officer.

NAC 555.010 Designation and categorization of noxious weeds. (NRS 555.130)

The plants listed below are designated noxious weeds and categorized as follows:

- **Category A weeds** are generally not found in or limited in distribution throughout the State. Such weeds are subject to active exclusion from the State and active eradication wherever found and active eradication from the premises of a dealer of nursery stock. Control is required by the State in all infestations.
- **Category B weeds** are generally established in scattered populations in some counties of the State. Such weeds are subject to active exclusion where possible and active eradication from the premises of a dealer of nursery stock. Control is required by the State in areas where populations are not well established or previously unknown to occur.
- **Category C weeds** are generally established and widespread in many counties of the State and are subject to active eradication from the premises of a dealer of nursery stock. Abatement is at the discretion of the state quarantine officer.

Table 3-26 contains a listing of noxious weeds that threaten Nevada; it is maintained online by the Nevada Department of Agriculture at this link:

http://agri.nv.gov/nwac/PLANT_NoxWeedList.htm

Table 3-26. Noxious Weeds that Threaten Nevada

Category A Weeds:			
African rue	(*Peganum harmala*)	Iberian starthistle	(*Centaurea iberica*)
Austrian fieldcress	(*Rorippa austriaca*)	Klamath weed	(Hypericum perforatum)
Swainsonpea	*(Sphaerophysa salsula)*	Malta starthistle	(Centaurea melitensis)
Black henbane	(*Hyoscyamus niger*)	Mayweed chamomile	(*Anthemis cotula*)
Camelthorn	(*Alhagi pseudalhagi*)	Mediterranean sage	(*Salvia aethiopis*)
Common crupina	(*Crupina vulgaris*)	Purple loosestrife	(*Lythrum salicaria, L. virgatum* & cultivars)
Dalmatian toadflax	(*Linaria dalmatica*)	Purple starthistle	(*Centaurea calcitrapa*)
Dyer's woad	(*Isatis tinctoria*)	Rush skeletonweed	(*Chondrilla juncea*)
Eurasian watermilfoil	(*Myriophyllum spicatum*)	Sow thistle	(*Sonchus arvensis*)
Giant reed	(*Arundo donax*)	Spotted knapweed	(*Centaurea maculosa*)
Giant salvinia	(*Salvinia molesta*)	Squarrose knapweed	(*Centaurea virgata*)
Goatsrue	(*Galega officinalis*)	Sulfur cinquefoil	(*Potentilla recta*)
Crimson fountain grass	Pennisetum setaceum	Syrian bean caper	(*Zygophyllum fabago*)
Houndstongue	(*Cynoglossum officinale*)	Yellow starthistle	(*Centaurea solstitialis*)
		Yellow toadflax	(*Linaria vulgaris*)
Hydrilla	(*Hydrilla verticillata*)		
Common St. Johnswort	(*Hypericum perforatum*)		

Category B Weeds:			**Category C Weeds:**	
Horse-nettle	(*Solanum carolinense*)		Canada thistle	(*Cirsium arvense*)
Diffuse knapweed	(*Centaurea diffusa*)		Hoary cress	(*Cardaria draba*)
Leafy spurge	(*Euphorbia esula*)		Johnsongrass	(*Sorghum halepense*)
Medusahead	(*Taeniatherum caput-medusae*)		Perennial pepperweed	(*Lepidium latifolium*)
Musk thistle	(*Carduus nutans*)		Poison-hemlock	(*Conium maculatum*)
Russian knapweed	(*Acroptilon repens*)		Puncture vine	(*Tribulus terrestris*)
African Mustard	Brassica tournefortii		Salt cedar (tamarisk)	(*Tamarix* spp.)
Scotch thistle	(*Onopordum acanthium*)		Spotted w(NAC 555.010) ater Hemlock	(*Cicuta maculata*)
Silverleaf Nightshade	(*Solanum elaeagnifolium*)			

Other invasive plants that are too widely distributed in Nevada to be included in the noxious weed list but present problems in Nevada are listed below:

- *Bromus tectorum* L. or Cheatgrass is an annual grass that forms tufts up to 2 feet tall.

The leaves and sheathes are covered in short soft hairs. The flowers occur as drooping, open, terminal clusters that can have a greenish, red, or purple hue. These annual plants will germinate in fall or spring (fall is more common) and senescence usually occurs in summer. Cheatgrass invades rangelands, pastures, prairies, and other open areas. Cheatgrass has the potential to completely alter the ecosystems it invades. It can completely replace native vegetation and change fire regimes. It occurs throughout the United States and Canada, but is most problematic in areas of the western United States with lower precipitation levels such as Nevada. Cheatgrass is native to Europe and parts of Africa and Asia. It was first introduced into the United States accidentally in the mid 1800s.

- *Bromus rubens L*. or Red brome*:* In the North American region red brome is reported to be invasive because it faces low herbaceous competition. Once established, it has the potential to compete with other grasses. The accumulation of litter and necromass has the potential to increase fire frequency in the desert. Red brome-fueled fires result in the loss of native perennial species in invaded areas, resulting in disturbed areas that are ideal for increased growth of red brome.

Noxious weed species distribution maps throughout the state may be accessed via the following link: http://agri.nv.gov/Plant/Noxious_Weeds/speciesdist_maps/

Maps of locations of infestations of noxious weeds in the state by county may be accessed online at the following link, and are updated regularly with new maps as they become available:http://agri.nv.gov/Plant/Noxious_Weeds/county_weed_maps/

For further information or comments specific to noxious or invasive plants and/or the Nevada Department of Agriculture Noxious Weed Programs please contact:

Kim L. Williams, Nevada Natural Heritage Program Weed Data Manager at 775- 684-2912*,* *kimwilliams@heritage.nv.gov*

Animal infestations - Insects

The USDA National Invasive Species Information Center maintains a website with up-to-date information on invasive species affecting each state at the following link: http://www.invasivespeciesinfo.gov/animals/main.shtml

Invertebrate Species
Invertebrate species are animals which lack a spine or backbone. Example species inclu worms; jellyfish; squids; sponges; and others.

The following is a list of invasive invertebrate species infestations currently affecting Nevada:

Africanized Honeybee (*Apis mellifera scutellata***)**
Asian Citrus Psyllid (*Diaphorina citri***)**
Asian Long-Horned Beetle (*Anoplophora glabripennis***)**
Asian Tiger Mosquito (*Aedes albopictus***)**

Brown Marmorated Stink Bug (*Halyomorpha halys***)**
Cactus Moth (*Cactoblastis cactorum***)**
Chilli Thrips (*Scirtothrips dorsalis***)**
Citrus Longhorned Beetle (*Anoplophora chinensis***)**
Common Pine Shoot Beetle (*Tomicus piniperda***)**
Emerald Ash Borer (*Agrilus planipennis***)**
European Gypsy Moth (*Lymantria dispar***)**
European Spruce Bark Beetle (*Ips typographus***)**
Formosan Subterranean Termite (*Coptotermes formosanus***)**
Giant African Snail (*Lissachatina fulica***)**
Glassy-Winged Sharpshooter (*Homalodisca vitripennis***)**
Hemlock Woolly Adelgid (*Adelges tsugae***)**
Light Brown Apple Moth (*Epiphyas postvittana***)**
Mediterranean Fruit Fly (*Ceratitis capitata***)**
Mexican Fruit Fly (*Anastrepha ludens***)**
Pink Bollworm (*Pectinophora gossypiella***)**
Pink Hibiscus Mealybug (*Maconellicoccus hirsutus***)**
Red Imported Fire Ant (*Solenopsis invict***a)**
Russian Wheat Aphid (*Diuraphis noxia***)**
Silverleaf Whitefly (*Bemisia argentifolii***)**
Sirex Woodwasp (*Sirex noctilio***)**
Soybean Cyst Nematode (*Heterodera glycines***)**R

Vertebrate Species
Vertebrate species are animals with backbones or spinal columns. In some cases closely related species such as the hagfish which lack a spine but have a bony skull or cranium are included in the group. Example species include: bony fish; sharks; rays; amphibians; reptiles; mammals; and birds.

The following is a list of invasive vertebrate species infestations currently affecting Nevada:

Burmese Python (*Python molurus bivittatus*)(*new as of Jun 4, 2012):*
Brown Tree Snake (*Boiga irregularis*)
Cane Toad (*Rhinella marina*)
European Starling (*Sturnus vulgaris*)
Wild Boar (*Sus scrofa*)

Although not listed as an invasive species, *Anabrus simplex* or Mormon crickets are flightless, ground- dwelling insects native to the western United States that cause periodic infestations in Nevada. They eat native, herbaceous perennials (forbs), grasses, shrubs, and cultivated forage crops, reducing feed for grazing wildlife and livestock. In large numbers, their feeding can contribute to soil erosion, poor water quality, nutrient depleted soils, and potentially cause damage to range and cropland ecosystems. Drought encourages Mormon cricket outbreaks, which may last several years (historically 5 to 21 years) and cause substantial economic losses to rangeland, cropland, and home gardens. Regional distribution of Mormon crickets is shown in Figure 3-22.

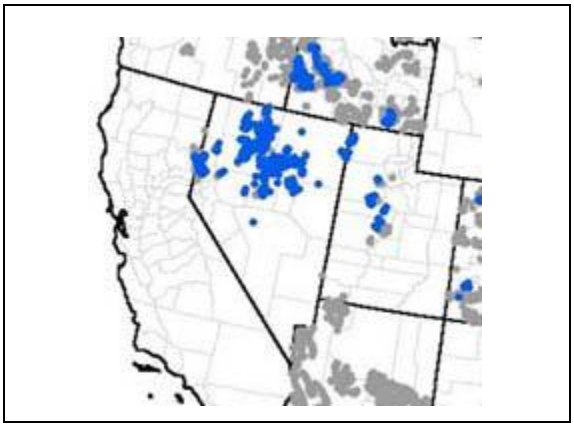


Figure 3-22. Regional Distribution of Mormon Crickets, August 2005

(blue = high density, gray =low density)

Source: University of Nevada, Cooperative Extension – Identification and Management of Mormon Crickets fact sheet 06-16 available online at: http://www.unce.unr.edu/publications/files/ag/2006/fs0616.pdf

Animal infestations – aquatic species

In June, 2011, AB 167 was passed by which Nevada Department of Wildlife (NDOW) will develop a coordinated statewide aquatic invasive species (AIS) management plan to control and prevent the spread of species such as quagga mussels and many others. The bill makes it illegal to deliberately introduce any aquatic invasive species into Nevada waters. NDOW will develop a boat inspection and decontamination plan for high risk waters, an early detection monitoring plan, and a rapid response plan for new invasions. In addition, new long term control and restoration measures will be developed. Implementation of the program will be supported both by fines and by watercraft registration fees.

At this time 144 nonindigenous aquatic species are tracked by USGS in Nevada with regular updates reported online on this website:

http://www.invasivespeciesinfo.gov/unitedstates/nv.shtml

These include many fish, several plants, and a few invertebrate aquatic species that have become of particular concern in Nevada in recent years such as zebra mussels, quagga mussels, Asian clams, and New Zealand mud snails.

Zebra mussels, *Dreissena polymorpha,* were first found at Lake Mead in 2004 and quagga mussels, *Dreissena bugensis,* were found there in 2007. Since that time, the population has exploded, now numbering in the trillions. Both mussels are nuisance invasive species that reproducing quickly and in large numbers. They are biofoulers that obstruct pipes in municipal and industrial raw-water systems, requiring millions of dollars annually to maintain. They produce microscopic larvae that float freely in the water column, and thus can pass by screens installed to exclude them. Monitoring and control of these mussels cost millions of dollars annually. As filter feeders, zebra and quagga mussels remove suspended material from the habitat in which they live. This includes the planktonic algae that are the primary base of the food web. Thus, these mussels may completely alter the ecology of water bodies in which they invade. In 2010, the New Zealand mudsnails were found at a Lake Tahoe Basin inspection, and

University of Nevada, Reno research has determined that Lake Tahoe water can support quagga mussels. Proactive measures are being taken by a number of groups to prevent the spread of these species into Lake Tahoe and the Truckee watershed.

The **Asian clam***, Corbicula fluminea,* is a relatively new aquatic invasive species that is becoming established in Lake Tahoe. Asian clams can impact Lake Tahoe's environment by:

- Releasing nitrogen and phosphorus to the lake, resulting in algal blooms.
- Negatively impacting drinking water by clogging intake pipes.
- Littering beaches with their sharp shells, negatively impacting recreation.

Asian Clam Removal Project

There is an ongoing aquatic invasive species mitigation project in 2010 by the Tahoe Resource Conservation District to physically remove Asian clams from south shore areas of Lake Tahoe by installing two-½ acre plots of plastic 45 mil pond liner and thin rubber matting on the lake bottom along the southeast shore of the lake in Marla Bay near Lakeside Marina, to cover and terminate Asian clam populations by reducing oxygen and food availability. The project is a multi-agency collaborative effort with multiple funding sources including UNR, UC Davis, U.S. Fish and Wildlife, Tahoe Regional Planning Agency, CA State Parks, Nevada Department of Environmental Protection, Lahontan WQCB, and Lake Tahoe Water Purveyors. The forty-two 10' x 100' barriers were then removed in early November, 2011 and researchers from University of California, Davis (UC Davis) and UNR will monitor the experimental plots for the next year to determine whether or not Asian clam populations are reestablishing. The goals of the project have been to understand the effects of the mats on Asian clams and the feasibility of using the treatment in other areas of the lake. In 2011, the project expanded to Emerald Bay where a small population of Asian clams has colonized at the mouth of the bay. Tahoe RCD will continue to manage and coordinate these efforts in collaboration with its partners and funders.

New Zealand Mudsnail, *Potamopyrgus antipodarum* is a nuisance aquatic species now reported in a few Nevada streams along the periphery of the state, (see map in Figure 3-23) with the addition most recently in 2012 and 2013 of sightings in the Truckee River at the East McCarran bridge in Reno and on Maggie Creek, a tributary to the Humboldt River and near Carlin in Elko County. It is reported in all western states, except New Mexico and is listed as an invasive species in California. It reproduces rapidly and competes for food with native gastropods and other species and is detrimental to trout populations because of its lack of nutritional value. It is not yet a huge problem, but is being monitored in the state and may become more of a problem in the future.

The Tahoe Resource Conservation District (RCD) is a part of the Lake Tahoe Aquatic Invasive Species Working Group (LTAISWG). This group was formed to better share resources and information, standardize methods for treatment and data collection, perform coordinated education and outreach activities, obtain grants, and organize effective control efforts of aquatic invasive species affecting Lake Tahoe. Beginning in 2008, the Tahoe Resource Conservation District's invasive species program has included a boat inspection effort in the Tahoe Basin to prevent the spread of quagga and zebra mussels in the area.

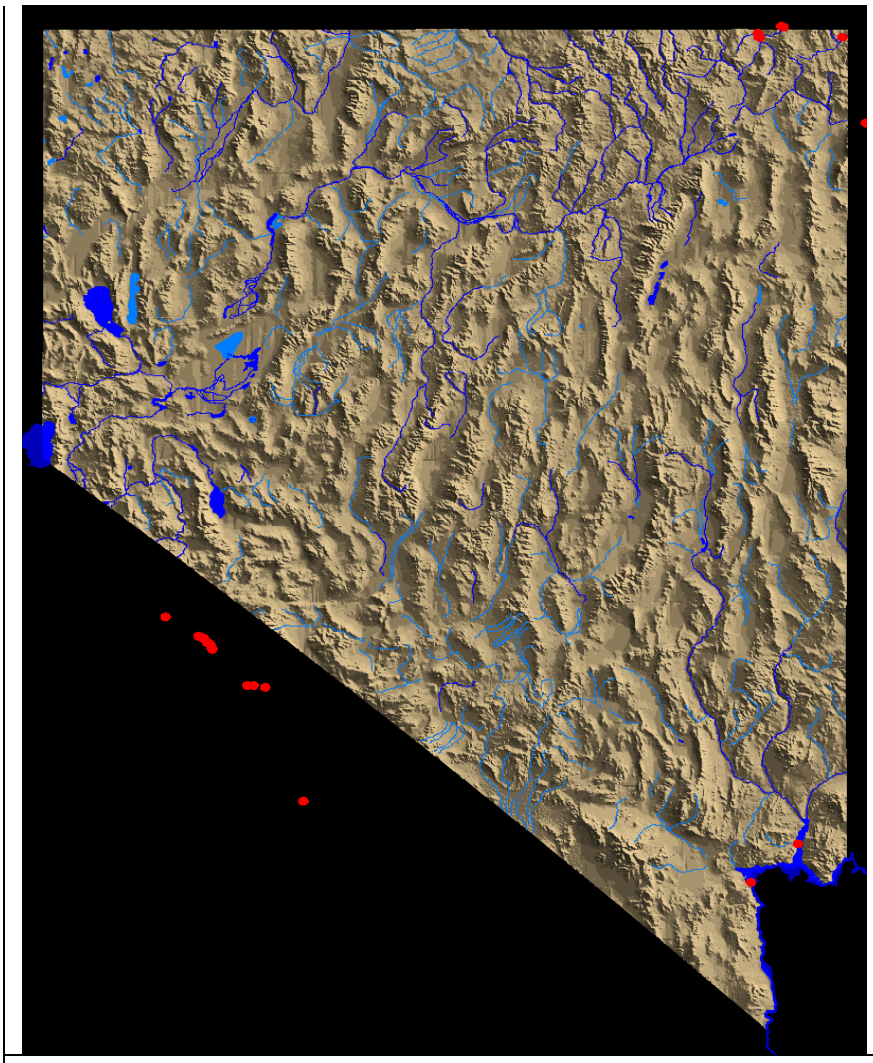


Figure 3-23. Dot Map Showing Reported Occurrences of New Zealand Mudsnails in Nevada and Adjacent Areas of California as of 2010**.**

Additional occurrences within the state on the Truckee and Humboldt Rivers and tributaries have since then been reported and may be viewed at this website:

http://nas.er.usgs.gov/taxgroup/mollusks/newzealandmudsnaildistribution.aspx

Currently in Lake Tahoe:

FLORA	FAUNA
Eurasian watermilfoil	Large-mouth bass
Curly leaf pondweed	Bluegill
	Bullfrogs
	Asian clam
	Quagga mussel
	Zebra mussel

In Truckee River, Humboldt River, and tributaries: New Zealand mudsnail

Aquatic weed removal

A second AIS mitigation project by Tahoe RCD involved aquatic weed removal (particularly Eurasian watermilfoil, Category A noxious weed, as well as Curly leaf pondweed) begun in April and September 2010 at Elks Point Marina and summer of 2011 in Emerald Bay near the Vikingsholm swim beach and pier, the Parson's Rock area, and near Avalanche Beach. The removal effort is a collaborative effort between the Tahoe RCD, TRPA, and the California Department of Parks and Recreation. The work was accomplished by deploying over 20,000 square feet of bottom barrier and by significant diver-assisted hand removal of invasive weeds resulting in near-eradication of weeds in part of the affected area.

The Truckee Meadows Water Authority is continuing and expanding its boat inspection program at Lake Tahoe that began with a $231,000 from the Truckee River Fund, money collected from utility bills to pay for projects and protect the Truckee River in spring 2010. The program efforts have included monitoring lakes and reservoirs within the Truckee River system for the presence of adult or juvenile mussels. It expanded at Lake Tahoe in 2012 to six highway boat inspection stations located at Spooner, North Star, Alpine Meadows Road, Homewood Ski Resort parking lot, and Myers at the intersection of U.S. 50 and 89 and the Diamond Peak parking lot in Incline Village.

The Southern Nevada Water Authority (SNWA), in cooperation with the Lake Mead National Recreations Area, UNLV, UNR, and other agencies have developed an Interagency Monitoring Action Plan to coordinate the collection and sharing of quagga mussel data for Lake Mead. No live adult quaggas have been found at SNWA treatment facilities and improvements are being implemented to prevent the colonization of the intake structures by mussels. Although quagga larvae have been found in the raw Lake Mead water as it comes into the treatment plants, SNWA's water treatment processes have been successful in destroying all quagga before they get into the drinking water system.

3.3.12.3 *Location, Severity, and Probability of Future Events*

Noxious weed species distribution will probably continue to expand outward from currently known geographic locations as described above and as shown on species distribution maps throughout the state at the following link:

http://agri.nv.gov/Plant/Noxious_Weeds/speciesdist_maps/

The severity of noxious weed infestations is continuously monitored by the State Department of Agriculture's A, B, C categorization of noxious weeds described in the previous section. Locations of infestations of some other insects and aquatic species are described in the previous section as well.

The Nevada Hazard Mitigation Planning Subcommittee agreed that plant, insect, and aquatic organism infestations will continue to occur throughout the state as recreation and commerce continue to move people and property across state lines. Cooperative efforts are necessary among state, federal, agencies and other interested regional groups to implement programs to control and mitigate the effects of infestations on all aspects of the state's environment and economy.

A final ~~"Q~~uagga-Zebra Mussel Action Plan for Western U.S. Waters" was submitted to the Aquatic Nuisance Species Task Force in February 2010 by the Western Regional Panel on Aquatic Nuisance Species. It details a plan for control and outlines initial costs, and charts current states' progress on control efforts including developing their own management plans for quagga and zebra mussel control. It is located online at this link: http://anstaskforce.gov/QZAP/QZAP_FINAL_Feb2010.pdf

These efforts have been strengthened since the last iteration of the plan by the passage of Nevada Revised Statute 503.597 in 2011 making it illegal to transport any aquatic invasive species into the state.

3.3.13 **Land Subsidence and Ground Failure** (Low Risk)

3.3.13.1 *Nature*

In the southwestern United States, agricultural and urban areas that depend on aquifer groundwater pumping are prone to land subsidence. Non-recoverable land subsidence occurs when declining water table levels lead to inelastic compaction of the solid particles in the aquifer (particularly clay minerals). A lesser amount of subsidence occurs with the recoverable compression of coarse-grained sand and gravel deposits. Earth fissures commonly accompany subsidence; these are vertical tension cracks in the sediment above the water table. Figure 3-24 shows the distribution of the aquifers in the state.

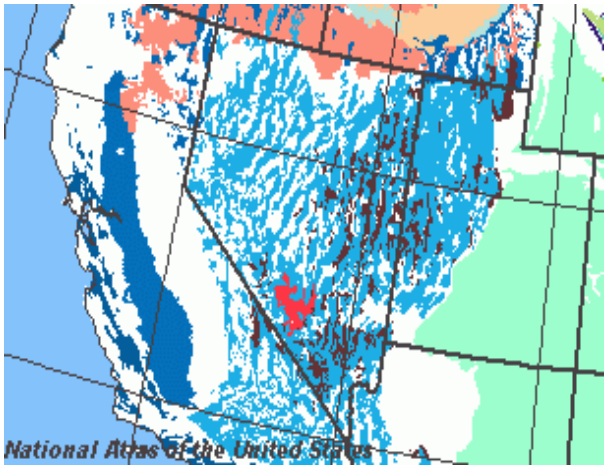


Figure 3-24. Nevada Aquifer Map

from USGS and the National Atlas of the United States

Map Key: Turquoise: alluvial aquifers, dark brown: carbonate aquifers; red: igneous and metamorphic-rock aquifers; white: other permeable bedrock.

Aquifers in Nevada are composed primarily of three major hydrogeologic units. One is the alluvial aquifer, which is the material that makes up the valleys between mountain ranges. Alluvial aquifers mostly consist of gravels, sands, silts, and clays. Another aquifer in Nevada is a carbonate aquifer, which is mainly made up of limestone and dolomite. These rocks comprise many mountain ranges in eastern and southern Nevada and underlie the alluvial aquifer in places. The third major aquifer type in Nevada consists of volcanic rocks and makes up many mountain ridges and underlies the alluvial aquifer in much of western and northern Nevada.

The major aquifer under Las Vegas Valley is an alluvial aquifer. Below the alluvial aquifer, at least in the western side of the valley, is the carbonate aquifer. Over-pumping (taking more water out than is naturally recharged from snow melt and rainwater) of the alluvial aquifer has caused subsidence problems in Las Vegas and Pahrump Valleys. To help mitigate this hazard, the Clark County building department has, as part of its building code, a requirement to conduct special geotechnical investigations near any earth fissures and faults to avoid building directly over these features.

The following link from the Nevada Division of Water Resources contains a map of ~~"~~Designated Groundwater Basins of Nevada":

http://water.nv.gov/programs/planning/stateplan/documents/fig-s3-7.pdf

3.3.13.2 *History*

Most subsidence problems in Nevada have developed in the Las Vegas Valley; however, this hazard is now recognized in other parts of Nevada. In the Nevada Hazard Mitigation Survey, Douglas, Nye, Storey, and Washoe Counties recognized that land subsidence is a risk. Evidence of groundwater-withdrawal-related land subsidence and local fissuring has been recognized near some of the large open-pit mining areas in Humboldt, Lander, Eureka, and Elko Counties. Sections of Interstate 80 west of Battle Mountain have been repaired because earth fissures developed in the freeway near one of the mines probably related to groundwater-withdrawal related issues.

Figure 3-25 shows that land subsidence can be caused by actions other than overdrafting of water. Mining, hydrocompaction, and underground fluid withdrawal (water, oil, or other fluid) can cause this hazard and result in land surface displacements and fissures. Hydrocompaction means that water absorbed on and within clay minerals is removed by withdrawal or drying, and the clays shrink. Shrinkage of clays results in less volume, so the surface will subside as the clays become more tightly compacted.

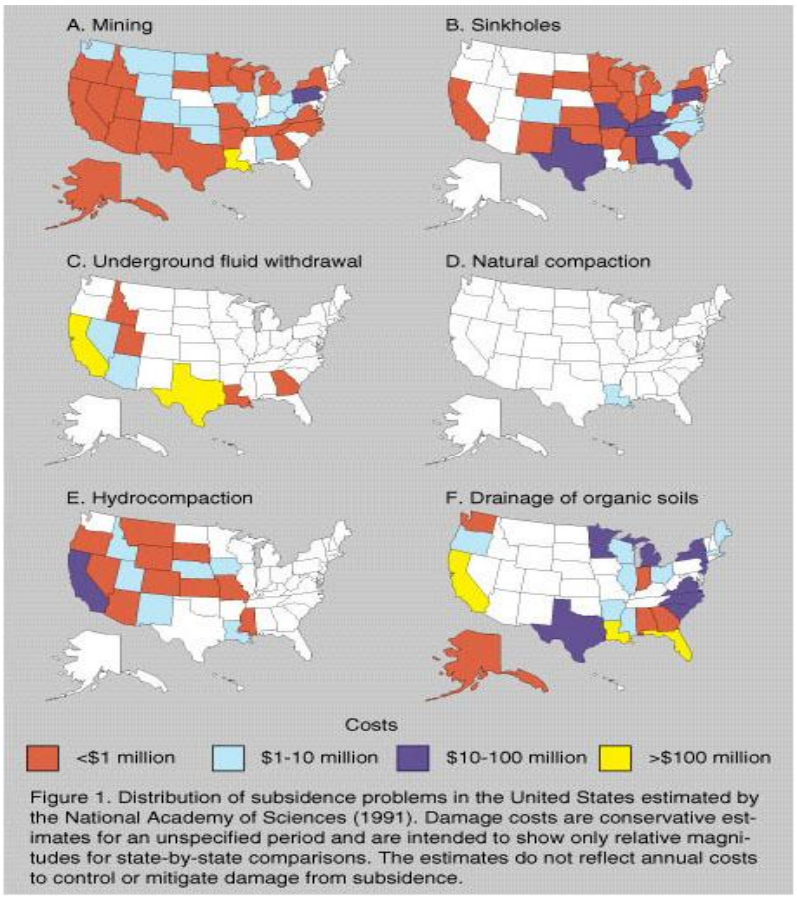


Figure 3-25. Distribution of Subsidence Problems in the U.S.

The primary problem in Storey County is one of collapse into excavations related to old mines on the Comstock Lode in Virginia City. This phenomenon is unrelated to groundwater

withdrawal and is a human-caused hazard similar to sinkholes that develop in areas with natural caverns near the surface. Officials in Storey County are well aware of the mine-collapse hazard and have records of collapses and repairs to roads that have occurred in recent years. At a meeting on 25 March 2010, Storey County officials discussed the problem with representatives of the Nevada Division of Emergency Management, Nevada Seismological Laboratory, and Nevada Bureau of Mines and Geology. Maps and models of old workings on the Comstock Lode and other mined areas can be used to locate areas of potential mine collapse. Seismometers that could be located in Virginia City may be able to detect small earthquakes related to pending collapse.

3.3.13.3 *Location, Severity, and Probability of Future Events*

As mentioned in the history section, Clark, Douglas, Nye, Storey, and Washoe Counties have problems with this hazard.

Las Vegas Valley in Clark County has more dramatic problems which include vertical aquifer-system deformation, land subsidence, and earth fissuring that have caused millions of dollars of damage and might have altered boundaries of flood-prone areas.

Land subsidence is considered by the Subcommittee to be a ―Low Risk" hazard. Unlike the rapid occurrences of fires, earthquakes, and floods, land subsidence generally occurs slowly, developing over periods of weeks, months, and years and affects localized areas.

Mine-collapse in Storey County is also considered to be ―Low Risk" from the State's perspective, because it will likely only affect localized areas and because recent mining in the area has indicated that most of the stopes (large openings) along the Comstock Lode have been filled by clay and weak rock, characteristic of the wall rock of the Comstock Lode, over the years since mining ceased. Nonetheless, the mine-collapse hazard is a serious consideration for officials, businesses, and residents in Virginia City.

Due to Nevada's history of new development and pressures on water systems, the state will most likely see more subsidence problems. However, mitigation may be achievable through education programs; revision of building codes; artificial recharging of ground water and geotechnical investigation of the land prior to building.

3.3.14 **Landslide** (Low Risk)

3.3.14.1. *Nature*

A landslide is the movement of rock and soil that may take place either gradually over a small area or more rapidly and involving a huge area, such as the landslides that have been documented on Slide Mountain between Reno and Carson City. Landslides may also be initiated by removal or absence of soil-retaining vegetation from causes such as range fires or changes in agricultural practices. Removal of material at the base of slopes may result in an unstable condition. Heavy building structures, road fills and cuts and mine dumps may add enough stress to initiate landslide movement in otherwise stable conditions. Some landslides in Nevada include rock falls. Some rock falls occur where sedimentary rocks are

capped by volcanic rocks (lava flows and other layered volcanic rocks). When the sedimentary rock weathers and erodes, it undermines the lava cap and a rock fall results.

Earthquakes and extreme rainfall events commonly initiate landslides. Debris flows, which are moving masses of rock fragments, soil, and mud, with more than half of the particles being larger than sand size, are considered a type of landslide in this risk assessment. Flash floods can initiate debris flows. In addition, wildfires often burn off vegetation that helps to trap moisture and soil; therefore, wildfires often leave ground vulnerable to debris flows that are initiated by extreme rainfall events (including flash floods). Another type of landslide in Nevada occurs in areas cut by perennial streams; As the stream waters erode its channel banks, and undercuts clay-rich sedimentary rocks along the bank, it destabilizing it and causes the ground above it to slide. Landslides in Nevada tend to be localized; therefore they tend to have less damaging economic impact than hazards of a widespread nature. Landslides can occur with earthquakes, major storms, floods, and melting ice and snow.

3.3.14.2. *History*

One example of landslides caused in an area undercut by perennial streams occurs at Mogul, on the Truckee River, west of Reno. As floodwaters have eroded the channel banks, the river has undercut clay-rich sedimentary rocks along its south bank, thereby destabilizing the ground and causing the ground above it to slide repeatedly.

Figure 3-26. Photo of the Aftermath of Slide Mountain Landslide/Ophir Creek Debris Flow in 1983.

The largest recorded event of a damaging landslide in Nevada's recent history happened May 30, 1983 on the eastern slope of Slide Mountain in the Sierra Nevada southwest of Reno (Figure 3-26). At about noon, a large granodiorite slab as much as 30 m thick, 90 m wide and several hundred meters long detached from the southeast face of Slide Mountain, slid downslope about 75 m and entered Upper Price Lake, a small reservoir on Ophir Creek, displacing most of the lake water, which overtopped and breached a low dam. The water then breached the dam of Lower Price Lake and sent a flood down Ophir Creek, where the rapidly moving water picked up fine and coarse rocky debris in the steep canyon, becoming a thick, fast-moving debris flow. The flow emerged from the canyon 4 miles downstream and spread out over the alluvial fan of Ophir Creek in Washoe Valley destroying and damaging houses, causing one fatality, and covering old U.S. Highway 395.At least two other people were caught up debris flow but managed to escape it and survive with multiple severe injuries. The slide caused at least $2 million in property damage to the area. The fact that similar events have occurred many times in the past is documented on the geologic map of the area published by the Nevada Bureau of Mines and Geology in 1975 (Map 5Ag of the Washoe City Quadrangle). Patrick Glancy, a hydrologist with the U.S. Geological Survey (USGS) has conducted extensive research on the geologic history of Ophir Creek rockslides and flooding events.

The USGS reports that there is a probability of the occurrence of similar slides south of Kingsbury Grade in Douglas County and along Second Creek where populated neighborhoods of Incline Village exist today.

3.3.14.3 *Location, Severity, and Probability of Future Events*

In the Nevada Hazard Mitigation Survey, Douglas, Storey, and Washoe Counties reported landslides as a danger with the following areas particularly vulnerable: Slide Mountain, Kingsbury Grade, and Incline Village areas.

In the Carson City Hazard Mitigation Plan, it was mentioned that the burned-over Waterfall fire area in the foothills west of Carson City would be prone to landslides unless the area were revegetated.

Landslides are considered a ~~L~~low Risk Hazard" in Nevada primarily because Nevada is drier (in terms of average annual precipitation) than other states, and few people live in steep terrains or on rocks and soils that typically move in landslides. However, as development encroaches on areas that are higher in elevation than the valley floors, such as alluvial fans, where most new development and building are occurring, it is likely that landslides and debris flows will become more significant hazards. Due to the limited geographic extent of this hazard, management and mitigation are best handled at the local level. Support and technical assistance to local entities are available from state agencies in response to this type of hazard.

3.3.15 **Severe Winter Storm and Extreme Snowfall** (Medium/Significant Risk)

3.3.15.1 *Nature*

Winter storms can bring heavy rain or snow, high winds, extreme cold, and ice storms. In Nevada, winter storms begin with cyclonic weather systems in the North Pacific Ocean or the Aleutian Islands that can cause massive low-pressure storm systems to sweep across the western states as shown in Figure 3-27. Winter storms plunge southward from arctic regions and drop heavy amounts of snow and ice. The severity of winter storms is generally minor. However, a heavy accumulation of snow and ice can create hazardous conditions. Additionally, a large winter storm event can also cause exceptionally high rainfall that persists for days, resulting in heavy flooding.

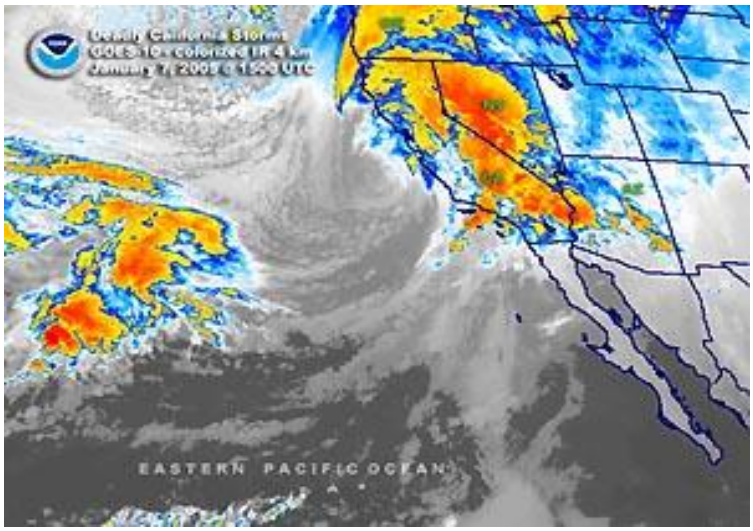


Figure 3-27. January 2005 Storm System
Courtesy of NOAA

3.3.15.2 *History*

During winter months, Nevada's higher elevations regularly experience rain, snow and freezing rain. Although less common, these conditions may also be experienced in lower elevations of the State.

Nevada's Basin and Range topography provides the necessary conditions for down-slope winds on the leeward (east) side of the ranges and into the valleys. North-south transportation routes can become obscured by blowing dust or snow during extreme wind conditions. Appendix K contains a Nevada Climate Office storm event summary by county with damage costs.

Table 3-27 lists some past severe winter storms in Nevada causing recorded deaths, injuries, economic hardship, or property damage.

Table 3-27. Severe Winter Storms in Nevada

Date	Location	Deaths, Injuries, Damages
1889-90	Genoa area, northern NV	This winter season was known as the "White Winter" when nearly 100 inches of snow - the heaviest snowfall in northern Nevada history. An estimated 90-95% of the state's livestock died during that winter.
Winter 1937	Las Vegas area, Clark and Lincoln counties	Although severe winter storms are generally thought to affect mainly northern Nevada, a snow storm left twelve inches of snow on Las Vegas and the Caliente Herald reported they were having the "coldest weather spell in memory for the past five days", with temperatures down to 10° above to 31° below zero, with 18 inches of snow.
February, 2004	Sierra Nevada Tahoe area	2 deaths. Severe winter storm. Gusts on the ridges were up to 110 mph. There were white-out conditions in Tahoe area. Several minor accidents were caused by the storm.
December 29, 2004 through January 10 2005:	Northern Nevada	FEMA designated 15 counties (Carson City, Churchill, Clark, Douglas, Elko, Eureka, Humboldt, Lander, Lincoln, Lyon, Mineral, Nye, Storey, Washoe, and White Pine) eligible for federal funding to pay part of the cost for emergency protective measures undertaken as a result of the snowstorm on December 29 through January 2. Shortly thereafter, FEMA designated these counties plus Pershing County eligible for federal funding as a result of another snowstorm on January 6-10.

Feb. 25, 2011	Reno-Carson City –Minden area, Northern Nevada	Up to 18 inches of snow with up to 50 mph winds caused 25 power poles to break and multiple auto accidents and 2 injuries and $250,000 damages. Nonessential State workers were sent home.
January 2013	Northern Nevada	Governor Sandoval declared a state of emergency due to prolonged cold winter temperatures, allowing extended hours for propane truck driver deliveries. Subzero cold was been responsible for several deaths in Elko, Reno, and South Lake Tahoe in January.

Additionally, National Oceanic and Atmospheric Administration (NOAA) compiled the following data shown in Table 3-28 for the top 25 periods of excessive snow (15.0 inches or greater of total snowfall).

Table 3-28. Severe Winter Storms in Nevada in Decreasing Order of Snowfall

Inclusive Dates		**Total Snowfall / Daily Maximum Amt. (Date)**
Jan. 10–14, 1911		37.9/19.7 (Jan. 12)
Dec. 1–5, 1919		33.6/11.5 (Dec. 3)
Jan. 31–Feb. 6, 1901		28.4/10.1 (Feb. 5)
Feb. 9–11, 1922		27.4/12.6 (Feb. 10)
Jan. 17–18, 1916		25.5/22.5 (Jan. 17)
Dec. 29, 2004–Jan. 1, 2005		22.2/16.4 (Dec. 30)
Feb. 16–21, 1897		22.1/10.0 (Feb. 16)
Feb. 10–12, 1959		21.9/13.2 (Feb. 10)
Feb. 16–18, 1990		21.1/18.0 (Feb. 16)
Dec. 23–29, 1941		20.0/6.5 (Dec. 27)
Jan. 15–20, 1933		19.1/10.5 (Jan. 19)
Jan. 15–16, 1913		19.0/ 10.0 (Jan. 16)
Jan. 24–27, 1956		17.8/11.0 (Jan. 25)
Feb. 23–26, 1969		17.3/8.0 (Feb. 24)
March 14–15, 1952		17.1/13.6 (March 14)
Jan. 28–30, 1937		17.0/10.1 (Jan. 30)
Jan. 22–25, 1923		16.5/9.2 (Jan. 24)
Jan. 7–8, 2005		16.4/10.5 (Jan. 8)
Nov. 8–12, 1985		16.3/15.2 (Nov. 10)
Jan. 3–Feb. 4, 1938		15.6/8.6 (Feb. 3)
March 1–3, 1902		15.5/14.4 (March 1)
Feb. 4–9, 1976		15.1/5.1 (Feb. 4)

The State Climatologist prepared a report on extreme snowfall averages in each county based on historical records. These data are available in Appendix K. A summary of the data is presented in a table showing the average number of days per year with extreme snowfall for representative sites in each county. Extreme snowfall is defined as that above the 15th percentile for that county. These data will assist each county in its preparedness and response planning for extreme snowfall events.

3.3.15.3 *Location, Severity, and Probability of Future Events*

Severe winter storms are considered to be ~~"M~~Medium/Significant Risk" hazards. They occur frequently and can cause significant damage to structures that have not been built to meet current building codes. Because the transportation infrastructure within the state is rather robust, weather-related events do not generally have much long-lasting effect on the transportation network. Weather events may cause temporary closures, but generally do not cause damage. The exception is severe flooding, that can be caused when storms bring large amounts of rain or warm rain on top of already heavy snow packs. These winter floods can cause significant damage to roads, railways, airports, etc.

Because snowstorms occur yearly in Nevada, most local and state jurisdictions are able to manage this type of event. Only when the storms are severe and repeated is there a possibility of this hazard causing damage. Accordingly, more research is necessary to determine and prioritize actions that will mitigate this hazard. The Subcommittee will assist in the development of strategies to mitigate this hazard as new data become available.

3.3.16 Terrorism/Weapons of Mass Destruction (WMD) (Medium/Significant risk)

3.3.16.1 *Nature*

According to the U.S. Code of Federal Regulations, terrorism is defined as ~~"t~~the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives" (28 C.F.R. Section 0.85). Terrorism falls into two general categories: international or domestic which, for purposes of federal law enforcement, are defined by the Federal Bureau of Investigation (FBI).

International Terrorism

As defined by the FBI, ~~"i~~international terrorism involves violent acts or acts dangerous to human life that are a violation of the criminal laws of the United States or any state, or that would be a criminal violation if committed within the jurisdiction of the United States or any state. These acts appear to be intended to intimidate or coerce a civilian population, influence the policy of a government by intimidation or coercion, or affect the conduct of a government by assassination or kidnapping. International terrorist acts occur outside the United States or transcend national boundaries in terms of the means by which they are accomplished, the persons they appear intended to coerce or intimidate, or the locale in which their perpetrators operate or seek asylum." According to the U.S. Department of State, the current list of designated foreign terrorist organizations contains over 50 groups. Most prominent among these groups are al-Qa'ida, Al-Shabaab, Boko Harem, HAMAS (Islamic Resistance Movement), and Hizballah (Party of God). These groups share a similar

Islamic extremist ideology; however, their objectives and, more importantly, their capabilities are different.

- **al-Qa'ida and affiliates:** al-Qa'ida was established by Usama Bin Ladin in 1988 with Arabs who fought in Afghanistan against the Soviet Union. al-Qa'ida's declared goal is the establishment of a pan-Islamic caliphate throughout the Muslim world. Toward this end, al-Qa'ida seeks to unite Muslims to fight the West, especially the United States, expel Western influence from Muslim countries, and destroy Israel. On 11 September 2001, 19 al-Qa'ida suicide attackers hijacked and crashed four U.S. commercial jets—two into the World Trade Center in New York City, one into the Pentagon near Washington, D.C., and a fourth into a field in Shanksville, Pennsylvania—leaving nearly 3,000 people dead. al-Qa'ida also directed the 12 October 2000 attack on the USS Cole in the port of Aden, Yemen, killing 17 U.S. sailors and injuring another 39, and conducted the bombings in August 1998 of the U.S. embassies in Nairobi, Kenya, and Dar es Salaam, Tanzania, killing 224 people and injuring more than 5,000. Since 2002, al-Qa'ida and affiliated groups have conducted attacks worldwide, including Europe, North Africa, South Asia, Southeast Asia, and the Middle East. Despite leadership losses, al-Qa'ida remains committed to conducting attacks in the United States and against American interests abroad. The group has advanced several unsuccessful Western plots in the past two years, including against the United States and Europe. al-Qa'ida's ability to continue attack preparations while under sustained counterterrorism pressure speak to the resilience of this organization and its followers. Additionally, several factions of al-Qa'ida, including al-Qa'ida in the Islamic Maghreb (AQIM) and al-Qa'ida in the Arabian Peninsula (AQAP) expand the capability of the al-Qa'ida on several fronts and each have their own distinct objectives though united by a common ideology. AQIM operates primarily in northern coastal areas of Algeria and in parts of the desert regions of southern Algeria and northern Mali. Their tactics primarily consist of guerrilla-style ambushes, mortar, rocket, and improvised explosive device (IED) attacks. Its principal sources of funding include extortion, kidnapping, donations, and narcotics trafficking. The group added the use of suicide bombings in April 2007, with attacks against government ministry and police buildings in Algiers that killed more than 30 people. al-Qa'ida in the Arabian Peninsula (AQAP) is a Yemen-based Sunni group and arguably the most dangerous of the al-Qa'ida factions. Since 2009, AQAP has orchestrated high-profile terrorist attacks and expanded its activities outside of Yemen, most notably by sending Nigerian-born Umar Farouk Abdulmutallab, who attempted to detonate an explosive device aboard a Northwest Airlines flight on 25 December 2009. This event was followed by an attempt to send explosive-laden packages to the United States on 27 October 2010. 2010 also saw the release of the first three issues of "Inspire" magazine, an AQAP-branded, English-language publication that first

appeared in July. Dual U.S.-Yemeni citizen Anwar al-Aulaqi, who had a worldwide following as a radical ideologue and propagandist, was the most prominent member of AQAP; he was killed in a counterterrorism operation in September 2011.

- **Al-Shabaab:** A radical Islamist militant group that controls most of southern and central Somalia. Al-Shabaab recently established an alliance with the more notorious al-Qa'ida which enhanced its legitimacy as an international terrorist group and likely broadened its appeal with extremists. The group is fighting an insurgency against the UN-backed Transitional Federal Government (TFG), which is based in Somalia's capital, Mogadishu. The group has also repeatedly threatened the United States and the West and has demonstrated the capacity to strike beyond Somalia's borders. The group has claimed responsibility for several bombings—including suicide attacks—in Mogadishu and central and northern Somalia. Al-Shabaab is responsible for the assassination of Somali peace activists, international aid workers, numerous civil society figures, and journalists. The group gained additional notoriety by blocking the delivery of aid from some Western relief agencies during a 2011 famine that has killed tens of thousands and still threatens millions of Somalis. Several Somali emigrant population centers in the U.S. provide a base of ideological and financial support to Al-Shabaab. On 29 February 2008, the U.S. Government designated al-Shabaab as a Foreign Terrorist Organization under Section 219 of the Immigration and Nationality Act (as amended) and as a Specially Designated Global Terrorist under Section 1(b) of Executive Order 13224 (as amended).

- **Boko Haram:** A Nigeria-based group that seeks to overthrow the current Nigerian Government and replace it with a regime based on Islamic law. The group, which has existed in various forms since the late 1990s, suffered setbacks in July 2009 when clashes with Nigerian Government forces led to the deaths of hundreds of its members, including former leader Muhammad Yusuf. In July 2010, Abubakar Shekau, appeared in a video claiming leadership of the group and threatened attacks on Western influences in Nigeria. Later that month, Shekau issued a second statement expressing solidarity with al-Qa ida and threatened the United States. Under Shekau's leadership, the group has continued to demonstrate growing operational capabilities, with an increasing use of improvised explosive device (IED) attacks against soft targets. Boko Haram's 26 August 2011 vehicle-bomb attack on the UN headquarters in Abuja, which killed at least 23 people and injured more than 80, marked the group's first lethal operation against Western interests.

- **HAMAS (Islamic Resistance Movement):** Formed in late 1987 at the beginning of the first Palestinian Intifada (uprising). Its roots are in the Palestinian branch of the Muslim Brotherhood, and it is supported by a robust social/political structure inside the Palestinian territories. The group's objectives include establishing an Islamic Palestinian state in place of Israel and it rejects all agreements made between the PLO and Israel. More recently, HAMAS has publicly expressed a

willingness to accept a long-term cessation of hostilities if Israel agrees to a Palestinian state based on the 1967 borders, with Jerusalem as its capital. HAMAS's strength is concentrated in the Gaza Strip and areas of the West Bank. HAMAS refuses to recognize Israel or renounce violence against Israelis and, since early 2008, has conducted at least one suicide bombing and numerous mortar and rocket attacks against Israel. HAMAS may enjoy some financial and ideological support among some Palestinian immigrant populations in the U.S. The United States Government has designated HAMAS as a Foreign Terrorist Organization.

- **Hezbollah ("Party of God"):** a Lebanon-based Shia terrorist group that advocates Shia empowerment within Lebanon. The group also supports Palestinian rejectionist groups in their struggle against Israel and provides training for Iraqi Shia militants attacking Coalition forces in Iraq. Hezbollah has been involved in numerous anti-U.S. terrorist attacks, including the suicide truck bombings of the U.S. Embassy in Beirut in April 1983, the U.S. Marine barracks in Beirut in October 1983, and the U.S. Embassy annex in Beirut in September 1984, as well as the hijacking of TWA 847 in 1985 and the Khobar Towers attack in Saudi Arabia in 1996. Although Hezbollah's leadership is based in Lebanon, the group has established cells worldwide. Hezbollah may also enjoy financial and ideological support among some Lebanese immigrant populations in the U.S. and it is widely suspected that Hezbollah operatives are present in the U.S. as well. There is some indication that Hezbollah may serve as a proxy for the Government of Iran.

Domestic Terrorism

As defined by the FBI, ~~–~~Domestic terrorism is the unlawful use, or threatened use, of force or violence by a group or individual based and operating entirely within the United States or Puerto Rico without foreign direction committed against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof in furtherance of political or social objectives." Forms of domestic terrorism include: the illegal acts of those described as Homegrown Violent Extremists (HVEs), Extremists (religious, anti-government, political, etc), Hate Groups, and Lone Offenders.

- **Homegrown Violent Extremists (HVEs):** a homegrown violent extremist (HVE) is a person of any citizenship who has lived and/or operated primarily in the United States or its territories who advocates, is engaged in, or is preparing to engage in ideologically-motivated terrorist activities (including providing support to terrorism) in furtherance of political or social objectives promoted by a foreign terrorist organization, but is acting independently of direction by a foreign terrorist organization. HVEs are distinct from traditional domestic terrorists who engage in unlawful acts of violence to intimidate civilian populations or attempt to influence domestic policy without direction from or influence from a foreign actor or ideology.

- **Extremists:** individuals or groups who possess extreme views of social issues including abortion, environmental, animal rights, politics, and other issues, and engage in violence as means of achieving publicity or influencing private and

public policy. This group is inclusive of –eco-terrorists," factions of the Sovereign Citizens movement, and some religious extremists. Generally these groups walk a fine line between constitutionally protected activities and advocating or employing violence as a means of achieving their goals. Among these, the Sovereign Citizens are perhaps the most diverse. According to the FBI, the movement is a loose network of individuals living in the United States who believe that the federal, state, and local governments operate illegally. While not all sovereign citizens are violent, some may facilitate or engage in acts of violence directed at public officials, financial institutions, and government facilities in support of their belief that the legitimacy of U.S. citizenship should be rejected. Current U.S. intelligence indicates that acts of violence towards law enforcement perpetrated by Sovereign Citizens are becoming more common across the nation.

- **Hate Groups:** Groups or individuals who facilitate, support, or engage in acts of violence directed towards the federal government and ethnic minorities in support of their belief that their race is intellectually and morally superior to other races. The majority of these groups include white supremacists, racist skinhead extremists, and to a lesser degree, black supremacists. Media attention concerning illegal immigration, the political influence of non-white citizens, economic factors associated with non-white demographics, and perceived changes in Americas religious, sexual, and racial tolerance tend to fuel the rhetoric of hate groups. Members of these groups are typically bound by a common perception that their views or rights are infringed upon by a minority group.

- **Lone Offenders:** According to the Federal Bureau of Investigation (FBI) a lone offender is a single individual driven to hateful attacks based on a particular set of beliefs without a larger group's knowledge or support. In some cases, these lone offenders may have tried to join a group, but were excluded for being too radical or simply left the group because they felt it wasn't extreme or violent enough. Most domestic attacks are carried out by lone offenders to promote their own grievances and agendas. This category also includes individuals who suffer from mental illness and are motivated by their own interpretation of specific ideologies or perceived grievances.

- **Narco-Terrorism:** Thus far, Nevada has been largely unaffected by the growing violence associated with the drug trade in Mexico and the border states. As the U.S. continues to battle both increasing illegal immigration and the large volume of drugs including heroin, marijuana, methamphetamine, and cocaine flowing into the country across its southern border, the likelihood of terrorism related to the narcotics trade is increasing. Las Vegas is a distribution hub for several for the Mexican Drug Trafficking Organizations (MDTO) and the I-80 corridor is a frequently used distribution avenue for drugs going east from California and cash coming west for eventual distribution to Mexico.

3.3.16.2 History

In 2003, Nevada adopted Nevada Revised Statute (NRS) 202.4415 which defines an ~~a~~act of terrorism" as any act that involves the use or attempted use of sabotage, coercion or violence which is intended to:

- Cause great bodily harm or death to the general population; or
- Cause substantial destruction, contamination, or impairment of:
    - Any building or infrastructure, communications, transportation, utilities or services; or
    - Any natural resource or the environment

Coercion does not include an act of civil disobedience

Since its adoption, Nevada has not prosecuted anyone under the terrorism statute; however, at least eleven criminal events in Nevada's history employ the same capability and/or tactics associated with terrorist activities. At its core, terrorism is a criminal act. While these events were not defined as terrorism, the perpetrators conducted pre-operational activities and used attack methodologies similar, if not identical, to terrorist events. Within Nevada, the tactics included the production and use of improvised explosive devices (IEDs), active shooters, and the manufacturing of lethal biological toxins. These attack methodologies are similar to events in other states, as well as those conducted internationally. The primary difference between the acts which occurred in Nevada and those defined as terrorism appears to be motivation. Nevada actors appear to be primarily motivated by revenge, personal hatred, or mental disease, and specifically lack a religious extremist ideological component. In the past 30 years, Nevada has been the victim of several improvised explosive devices, active shooters, and at least one attempt to manufacture biological toxins. In most cases, catastrophic loss or mass casualties were avoided, or not incorporated into the attack methodology.

As terrorists continue to refine and improve their capabilities, Nevada remains vulnerable to unconventional tactics. Recent publications of the al-Qaida magazine ~~I~~inspire" attempt to radicalize susceptible individuals and provide instructions for creating IEDs from household products, target selection, and employment of firearms. Likewise, the terrorist arsenal continues to expand incorporating using fire as a weapon and experimental biological weapons. While Nevada may not have a large population susceptible to Islamic extremism, the tactics and techniques associated with these methodologies can be used by anyone.

3.3.16.3 Location, Extent, Probability of Future Events

Attacking the U.S., both in the homeland and abroad remains an enduring objective of al-Qa'ida and its affiliates, as well as those inspired by their extremist ideology. Numerous plots have been disrupted by intelligence services and law enforcement authorities, several in the final stages of execution. Events and facilities with high concentrations of people and facilities symbolic of Western ideals and excesses are frequent and recurrent themes in extremist aspirational attack plans. Las Vegas has been identified as a symbolic target of al-Qa'ida and their affiliates several times, and

Nevada is also home to both Islamic and right-wing extremists which have advocated violence in the past. Highly visible and prominent structures including casino properties, major dams, government buildings, and military installations are common terrorist targets. Nevada is home to all of these in abundance. Vulnerabilities associated with these targets include the inability to completely secure areas including casino properties, the ~~"s~~trip" in Las Vegas, and high concentrations of people gathering for events including New Year's celebrations, conventions, and other events in both Reno/Sparks and Las Vegas. Additionally, rural areas of Nevada provide ample space to conduct training and practice employment of terrorist weapons without observation. The expanding presence of MDTO's in the U.S. is also likely to result in narco-terrorism events associated with protecting the lucrative drug traffic.

Potential targets may include:

- The Las Vegas Strip
- Fremont Street, Las Vegas
- Major Events and Sports Events
- Hoover Dam
- Major Bridges
- Casinos
- Convention Centers
- Nellis Air Force Base
- Fallon Naval Air Station
- Davis Dam
- Government Occupied Facilities
- Transportation Networks
- Airports
- Mining Operations
- Energy Sector infrastructure

The severity of the impact of an act of terrorism in Nevada is dependent upon the motivation of the attacker, the type of attack, and the number of victims. For example, an al-Qa'ida inspired or sponsored attack against a casino property in Las Vegas would have a greater consequence than an eco-terrorist attack against a development property elsewhere in the state. An attack scenario employing less sophisticated weapons including improvised explosive devices (IED) and small arms is far more likely than a more sophisticated radiological chemical or biological attack, though the effects of such an attack may be far more severe. Cyber warfare is increasingly employed by state and non-state actors, and may be used to augment any of the terrorist attack methodologies.

Since the terrorist attacks of 11 September 2001, at least 40 major Islamist-inspired terror plots against the United States have been foiled. While terrorist attacks against U.S. targets at home and overseas have been declining steadily since 2005, thwarted plots have more than doubled during the same period. As extremist ideologies continue to expand, the question is not ~~"if"~~ but ~~"w~~hen" will Nevada experience a terrorist act.

3.3.17 **Tornado** (Low Risk)

3.3.17.1 *Nature*

Figure 3-28. Oldest tornado photograph, Howard, South Dakota
Courtesy of NOAA/ Dept. of Commerce

Tornadoes are one of nature's most violent storms. A tornado is defined as a rapidly rotating column of air extending from the base of a thunderstorm to the ground. In an average year, approximately 1,000 tornadoes are reported across the United States, resulting in an average of 80 deaths and over 1,500 injuries. The most violent tornadoes, with wind speeds of 250 mph or more, are capable of tremendous destruction. Damage paths can be more than 1 mile wide and 50 miles long. Tornadoes can occur anywhere in the United States, but they are most common in the Great Plains region that includes parts of Texas, Oklahoma, Kansas, and Nebraska. Tornadoes are responsible for the greatest number of wind-related deaths each year in the United States.

Tornadoes come in all shapes and sizes. In the southern states, peak tornado season is March through May; peak months in the northern states are during the summer. Tornadoes can also occur in thunderstorms that develop in warm, moist air masses in advance of eastward-moving cold fronts. These thunderstorms often produce large hail and strong winds, in addition to tornadoes. Tornadoes are extremely rare in Nevada since thunderstorm cloud bases are typically several thousand feet off the ground and the plethora of mountain ranges make it difficult for the circulations that spawn tornadoes to sufficiently develop.

3.3.17.2 *History*

Although tornadoes are rare in Nevada, they do occur. Nevada ranks 44th out of 50 states with only one touchdown incident recorded in an average year. It is believed there are more tornadoes that occur in Nevada per year, but they are rarely witnessed due to lack of population in rural areas. Texas ranks first with an average of 123 confirmed tornadoes every year. Between 1947 and 1973 in Nevada and the Sierra, thirteen confirmed touchdowns were recorded with thirty-three confirmed funnel clouds.

The tornado project online http://www.tornadoproject.com/alltorns/worstts.htm has a list of the worst tornadoes in every state. Table 3-29 contains a list of tornadoes in Nevada that have caused injury or property damage. All were ranked at F0 to F2 on a scale of F0 to F5. It should be noted the F-Scale has been redeveloped and was renamed the Enhanced Fujita Scale (ranging from EF0 to EF5). In the original scale, F0 stood for winds estimated at less than 73 miles per hour with typically light damage (some damage to chimneys, branches broken off trees, shallowly rooted trees pushed over, and sign boards damaged); in the Enhanced F Scale, which was implemented in the U.S. in 2007, three-second wind

gusts estimated based on damage on a tornado severity of EF0 are in the 65 to 85 mile-per-hour range.

Table 3-29. Nevada Tornado History

Date	Location	Description /injuries/damage
May 26, 1964 2:45 p.m.	Near Yerington	A small tornado damaged outbuildings on a ranch. One man was struck by flying debris. 0 dead, 1 injured
July 16, 1973 12:23 p.m	Six miles north of Reno	A small tornado touched down. 0 dead, 1 injured
March 30, 1992 11:45 a.m.	Extreme south edge of Las Vegas	One home was shifted and another partially unroofed. 0 dead, 0 injured.
June 24, 2004 4:00 p.m.	5 miles north of Lamoille, Elko County	0 dead, 0 injured.
June 25, 2004 4:15 p.m	Paradise Valley, Humboldt County	Trained weather spotter reported a rope-like tornado. 0 dead, 0 injured, no damage.
June 25, 2004 4:25 p.m	West side of the Sonoma Range, Winnemucca, Humboldt County	Trained weather spotter observed a tornado. 0 dead, 0 injured, no damage.
June 27, 2004 1:15 p.m	Near Winnemucca, in Humboldt County:	Trained weather spotter observed tornado. 0 dead, 0 injured, no damage.
July 24, 2004 2:30 p.m.	Cold Springs, north of Reno	The weak tornado lasted less than 2 minutes. 0 dead, 0 injured, no damage.
April 27, 2005 5:30 p.m.	Near Carson-Tahoe Hospital, in Carson City.	0 dead, 0 injured, no damage.
June 9, 2006, 11:05 a.m	About 1 mile west of the Eureka Airport, Eureka County.	A rope-like tornado was observed and photographed over open country. 0 dead, 0 injured, no damage.
July 21, 2008, 3-4:00 p.m.	Near Fallon, Churchill County.	Two EF0 tornadoes were reported by trained NWS weather spotters. 0 dead, 0 injured, no damage.
June 20, 2009, 2-3 p.m.	Near Wild Horse Reservoir, Elko County	Two EF0 tornadoes were observed, one by NHP and the other by a trained NWS weather spotter. 0 dead, 0 injured, no damage.
April 24, 2011 9:55 a.m.	Southern Humboldt County	An EF0 tornado touched down in a rural area and was photographed by several eyewitnesses. An NWS storm survey could find no visible damage. 0 dead, 0 injured, no damage.

3.3.17.3 *Location, Severity, and Probability of Future Events*

Appendix K contains a summary of damage-causing storm events by county prepared by the Nevada Climate Office. There were 84 tornadoes reported in Nevada between the years 1959 and 2006. There have been no tornado-related deaths, 2 injuries, and almost no damage. According to the data from the NOAA site, fifteen of the seventeen counties in Nevada have had one or more tornadoes since 1880. As new developments continue to be built, this hazard may become more evident.

Tornadoes are considered a ~~L~~low Risk" hazard in Nevada because few are reported each year anywhere in the state, the ones that do occur tend to be low in intensity, and they usually occur in unpopulated areas. Emergency response is likely to be handled without

federal or state assistance. Structures built to modern building codes should be able to withstand the gusts of an F0 tornado.

Climate change is expected to have little effect on the frequency or intensity of Nevada tornadoes, since they are rare and typically weak with a low severity ranking on the EF Scale.

Figure 3-29. June 9, 2006, Tornado in Diamond Valley near Eureka, NV. *Photo courtesy of Cheryl Morrison from Sheriff's office in Eureka*.

3.3.18 **Tsunami/Seiche** (Low Risk)

3.3.18.1 ***Nature***

A tsunami (pronounced soo-ná-mee), also known as seismic sea wave (often mistakenly called "tidal wave"), is a series of enormous waves created by an underwater disturbance such as an earthquake, landslide, volcanic eruption, or meteorite impact. A tsunami can move hundreds of miles per hour in the open ocean and smash into land with waves as high as 100 feet or more. A seiche is an oscillating wave on the surface of a lake or semi-enclosed basin, generally initiated by wind, earthquake, or change in atmospheric pressure. Seiches rarely exceed a few meters in height.

From the area where the tsunami originates, waves travel outward in all directions. Once the wave approaches the shore, it builds in height. The topography of the coastline and the ocean floor will influence the size of the wave. There may be more than one wave and the succeeding one may be larger than the one before. A small tsunami at one beach can be a giant wave a few miles away.

All tsunamis are potentially dangerous, even though they may not damage every coastline they strike. A tsunami can strike anywhere along most of the U.S. coastline. The most destructive tsunamis have occurred along the coasts of California, Oregon, Washington, Alaska, and Hawaii.

Earthquake-induced movement of the ocean floor most often generates tsunamis. If a major earthquake or landslide occurs close to shore, the first wave in a series could reach the beach in a few minutes, even before a warning is issued. Areas are at greater risk if they are less than 25 feet above sea level and within a mile of the shoreline. Drowning is the most common cause of death associated with a tsunami. Tsunami waves and the receding water are very destructive to structures in the run-up zone. Other hazards include flooding, contamination of drinking water, and fires from broken gas lines or ruptured tanks.

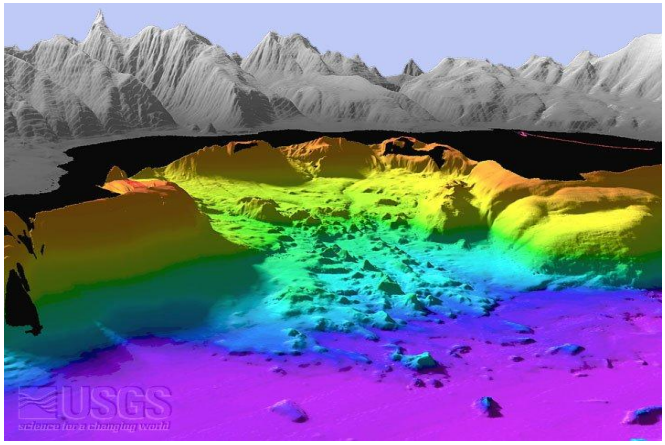


Figure 3-30. USGS Bathymetric View of Western Lake Tahoe, McKinney Bay.

Although Nevada is landlocked, a study by Santa Clara University, U.S. Geological Survey, and the University of Nevada, Reno has shown that a tsunami or seiche induced by an earthquake and landslide occurred at Lake Tahoe about 20,000 years ago. Although this incident is rare, this research shows that if a body of water is large enough with the right factors, then a tsunami/seiche can happen.

3.3.18.2 *History*

In 1999, Gene A. Ichinose, Kenji Satake, John G. Anderson, Richard A. Schweickert, and Mary M. Lahren from the Nevada Seismological Laboratory, Earthquake Research Department, and Department of Geological Sciences conducted a study to determine if a magnitude 7 earthquake could generate a tsunami or seiche wave, which could pose a hazard to shoreline communities of the Lake Tahoe Basin, California-Nevada. They concluded from their scenarios that such a quake would likely generate a wave as small as 3m and as large as 10m in amplitude that would threaten shoreline communities. A more recent study published in November 2006 showed evidence of a tsunami triggered by an earthquake and massive underwater landslide that deposited ridges of glacial boulders and smaller volcanic rocks on the ~~"T~~ahoe City Shelf," a triangular region fifty feet below the western shore of the lake and twelve miles from the ~~"M~~cKinney Bay slide" which undermined the western shore (Figure 3-31). In 2007, this team of scientists returned to Lake Tahoe to analyze the strength and stability of steep rock walls along the lake, which could collapse and cause another seiche.

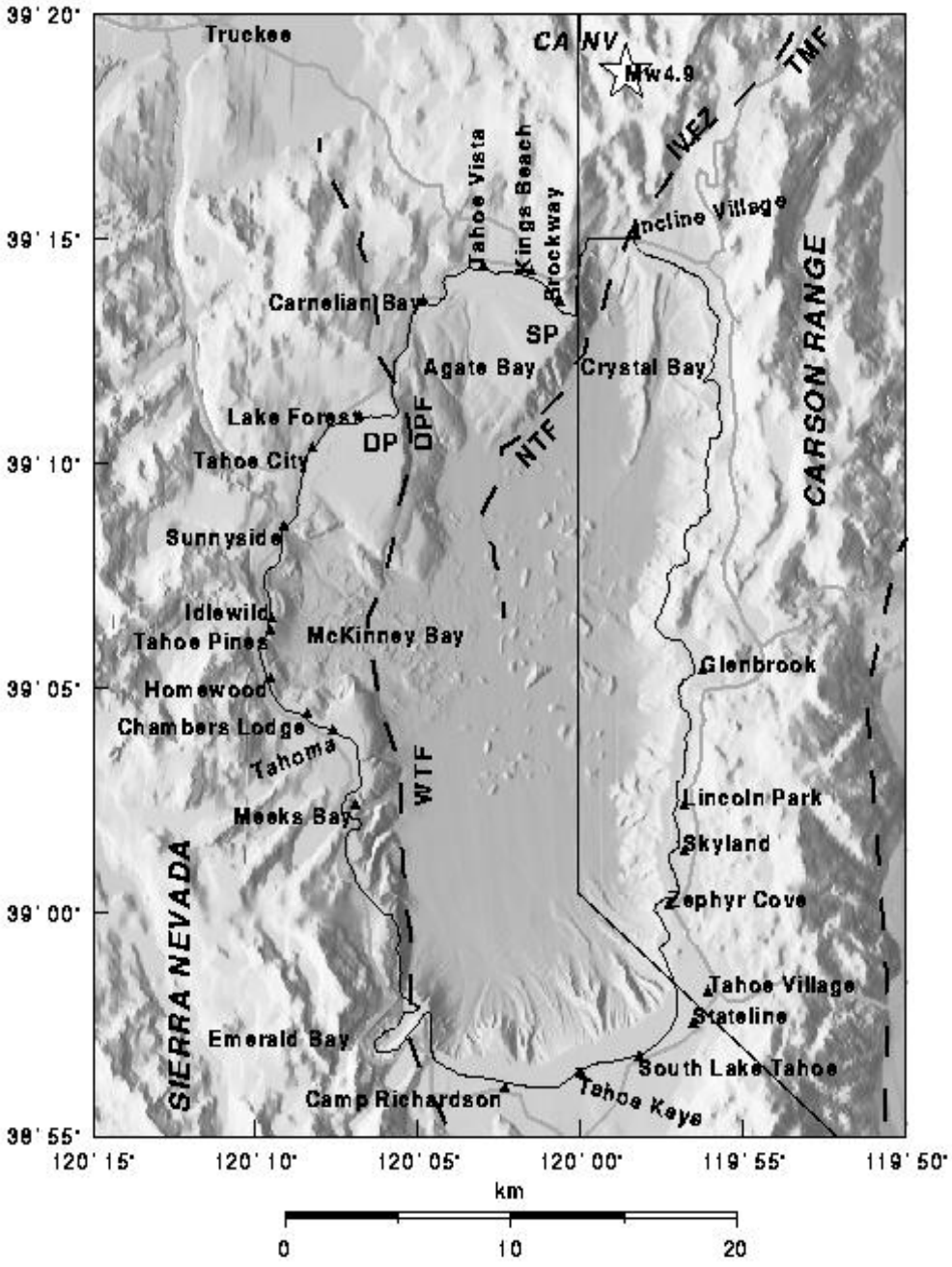


Figure 3-31. Lake Tahoe Fault Map.

Relief map of Lake Tahoe showing faults and debris on the floor of the lake resulting from landslides and debris flows spreading out from McKinney Bay across the floor of the lake. (SP= Stateline Point, NTF=North Tahoe fault line, IVFZ=Incline Village fault zone, TMF=Truckee Meadows fault, WTF=West Tahoe fault, DPF=Dollar Point fault).

3.3.18.3 *Location, Severity, and Probability of Future Events*

There is a tsunami hazard at Lake Tahoe primarily because faults occur below the lake. These are dip-slip faults (ones in which one side goes down relative to the other), which could cause displacement in the water column above the fault rupture. If the displacement is large enough, a damaging tsunami could be generated. A large, rapid landslide, either underwater within the lake or into the lake from the side, could also generate a tsunami; such a landslide could also be induced by an earthquake.

Nevada also has strike-slip faults (ones in which one side moves horizontally relative to the other side), but this motion is not likely to create significant vertical displacements in the water column. Although strike-slip faults do occur near or underneath Pyramid Lake and Lake Mead, geological evidence at this time does not indicate the presence of active normal faults capable of producing tsunamis in these or other large lakes in Nevada (other than Lake Tahoe). There is good bathymetric evidence of a major landslide that spread large blocks from McKinney Bay across the floor of Lake Tahoe (Figures 3-30 and 3-31). It appears that similarly large landslides have not occurred at the other large lakes in Nevada

Tsunamis are considered a low-risk hazard in Nevada primarily because the earthquakes that would likely cause sizeable tsunamis on Lake Tahoe, either directly by fault displacement or indirectly by a large landslide, occur only once every few thousand to few tens of thousands of years. If a tsunami does happen, most of the near-shore parts of communities surrounding Lake Tahoe would be at risk. There would be little or no warning, other than perhaps feeling the ground shake from the earthquake before the first wave of water hits. As is the case along the Pacific Northwest coast, the most effective tsunami-hazard mitigation may be training people to run to high ground as soon as possible, if they feel strong shaking from an earthquake. It must be noted that this is a limited exposure event, specifically to shoreline residents and visitors of Lake Tahoe –limited population, although the property damage value could be extensive. Although only Carson City and Washoe County listed this as a risk in their Hazard Mitigation Plans, the hazard also exists in Douglas County.

3.3.19 **Volcano** (Low Risk)

3.3.19.1 *Nature*

Volcanoes are created when internal forces in the earth cause heated, melted rock (magma) to rise to the surface. First collecting in magma chambers, some of the magma pushes upward through cracks and eventually vents to the Earth‘s surface. As the magma reaches the surface, it can erupt violently due to escaping gases (e.g., Mount St. Helens in 1980, Figure 3-32), it can erupt less spectacularly as a lava flow (e.g., Hawaii), or it can expand slowly as a lava dome (similar to the filling of the crater of Mount St. Helens in recent years).

Volcanoes have varied shapes and sizes, but are divided into three main kinds depending on the type of material that reaches the surface and the type of eruption that ensues.

Figure 3-32. Mount St. Helens 1980 Eruption
USGS Photograph by Austin Post

1. *Composite or Stratovolcanoes*

Composite volcanoes (stratovolcanoes) develop from repeated explosive and non-explosive eruptions of tephra (airborne lava fragments that can range in size from tiny particles of ash to house-sized boulders) and lava that build up layer by layer. These volcanoes are the largest and form symmetrical cones with steep sides. Mount Shasta, Mount Rainier, and Mount St. Helens are examples of stratovolcanoes.

2. *Shield Volcanoes*

Shield volcanoes form from ―gentle" or non-explosive eruptions of flowing lava. The lava spreads out and builds up volcanoes with broad, gently sloping sides. They are named for their low-profile shape that resembles a warrior's shield. Currently active volcanoes of this type are found in the Hawaiian Islands.

3. *Cinder Cones*

Cinder cones build up from lava that is blown violently into the air and breaks into fragments. As the lava pieces fall back to the ground, they cool and harden into cinders (lava fragments about ½ -inch in diameter) that pile up around the volcano's vent at the angle of repose. Cinder cones are the smallest volcanoes and are cone-shaped. Cinder cones are found in many areas of the western U.S., including Nevada.

4. *Phreatic Eruptions*

Phreatic eruptions occur when rising magma contacts ground or surface water. The extreme temperature of the magma (anywhere from 600 °C to 1170 °C (1110–2140 °F)) causes near-instantaneous boiling of groundwater resulting in an explosion of steam, water, ash, rock, and volcanic bombs. A less intense geothermal event may result in a mud volcano. This kind of activity is also described as steam-blast eruptions. Phreatic eruptions typically include steam and rock fragments and seldom erupt lava. The temperature of the fragments can range from cold to hundreds of degrees centigrade. If molten material is included, the term phreato-magmatic may be used. These eruptions occasionally create broad, low-relief craters called maars. Phreatic explosions can be accompanied by carbon dioxide or hydrogen sulfide gas emissions. The former can asphyxiate at sufficient concentration; the latter is a broad spectrum poison. A 1979 phreatic eruption on the island of Java killed 149 people, most of whom were overcome by poisonous gases.

5. *Calderas*

Calderas are large volcanoes that produce violent eruptions of ignimbrites – hot ash that wipes out areas tens to thousands of square miles in size. Although many calderas existed in Nevada tens of millions of years ago, none are active today. However, the Long Valley Caldera near Mammoth Lakes, California, deposited ash in much of western Nevada when it erupted approximately 760,000 years ago–a short time geologically speaking. Similarly, Mount Mazama, a stratovolcano in Oregon, deposited ash in Nevada approximately 7,700 years ago, when it erupted to create Crater Lake, a relatively small caldera.

3.3.19.2 *History*

Nevada Volcanic History and Hazards

Small eruptions from the Mono Craters area near Lee Vining and Mono Lake in eastern California have sent ash into Nevada as recently as about 260 years ago; an eruption from these volcanoes presents the most likely current volcanic hazard for Nevada. Other volcanoes that have erupted in recent history and could deposit ash in Nevada include Mount Lassen, Mount Shasta and the Long Valley Caldera in California and volcanoes in the Cascade Mountains in Oregon. The eruption of Mount St. Helens in 1980 deposited up to several centimeters of ash several hundred kilometers away from the volcano. The biggest threat to Nevada from eruptions in California and Oregon is damage to flying aircraft.

A massive eruption from the Long Valley Caldera near Mammoth Lakes, California about 760,000 years ago devastated a considerable area in Owens Valley when thick, hot flows of ash were deposited as far south as Bishop. Air-fall ash from these eruptions did collect as thick piles of ash in parts of Nevada, and some of the ash may have been hot enough or thick enough to devastate the landscape locally. Scientists would expect to see strong indications from seismographs before another eruption of this magnitude. The U.S. Geological Survey continues to monitor the area around Mammoth Lakes, and will issue warnings prior to any subsurface changes that could precede a major eruption.

Seismic and geodetic data at the north end of Lake Tahoe have been interpreted by researchers at the University of Nevada, Reno (K.D. Smith and others, 2004, Evidence for deep magma injection beneath Lake Tahoe, Nevada-California: Science, v. 305, p. 1277-1280) to indicate active magma at a depth of approximately 30 kilometers. There does not appear to be a near-term threat of volcanic eruption from this area, in part because the last documented eruption in the area was approximately one million years ago. It is likely that seismic instruments will detect any imminent eruption in time to warn people to avoid the hazard. Our ability to monitor small tremors associated with magma at depth is limited by the currently small number of seismographs that are operated in Nevada. The Nevada Seismological Laboratory and the U.S. Geological Survey have joint responsibilities for earthquake monitoring and warnings. The Advanced National Seismic System, which is authorized by Congress but currently has been funded at only a fraction of its intended size, will help to monitor for earthquakes and pending volcanic eruptions.

Soda Lake and Little Soda Lake near Fallon in Churchill County are maars, volcanoes that form by explosions when magma rises near the surface of the earth and boils the groundwater. They are probably the youngest volcanoes within the borders of the State. They have not erupted in recorded history, although they definitely are younger then the last high stand of Lake Lahontan, about 13,000 years ago, because deposits from these volcanoes overlie sediments deposited in the lake. On the basis of preliminary helium isotopic studies (Thure Cerling, University of Utah, personal communication, 1997), the eruption at Soda Lake may be younger than 1,500 years before present. Phreatic eruptions such as the one that caused Soda Lakes to form pose a risk of asphyxiation from volcanic gases released. Somewhat similar phreatic events, but without magma, have occurred at the Steamboat geothermal area just south of Reno. The youngest volcanic rocks exposed at the Earth‘s surface in the Steamboat area are approximately one million years old.

Other relatively young volcanoes occur in the Crater Flat–Lunar Crater zone, Nye County, which includes basaltic volcanoes ranging in age from about 38,000 to 1 million years old (Smith, E.I. Keenan, D.L., Plank, T. 2002, Episodic volcanism and hot mantle: implications for volcanic hazard studies at the proposed nuclear waste repository at Yucca Mountain, Nevada: GSA Today, v.12, no.4, p. 4-10); in Clayton Valley, near Silver Peak in Esmeralda County; near Winnemucca in Humboldt County; and near Reno in Storey County. Most of these are basaltic volcanoes, which typically form small cinder cones and small lava flows. There are also some one million-year-old rhyolitic lava flows in the Reno area near Steamboat Hot Springs, but volcanoes in this area are thought to be extinct.

Although geothermal power plants in many parts of the world are associated with active volcanoes, the 15 geothermal power plants in northern Nevada do not appear to be associated with magma. With the possible exception of the Steamboat geothermal system at the south end of Reno, the geothermal areas in Nevada appear to be derive their heat from deep circulation of groundwater rather than direct connections with magma or cooling igneous rock. A hazard that is recognized in the Steamboat area is violent eruption of steam, mud, and rock from geysers. As indicated on the geologic map of the Mt. Rose NE Quadrangle (Nevada Bureau of Mines and Geology Map 4Bg), such eruptions have occurred during the Quaternary Period near the Mount Rose Highway (Nevada Route 431), west of the intersection with U.S. Highway 395, and could occur again there or in other parts of the Steamboat area. The hazard from such eruptions is a local feature that would not be likely to require federal assistance.

3.3.19.3 *Location, Severity, and Probability of Future Events*

There is clearly some potential for ash from the Mono Craters and Inyo Craters to affect airplanes, air quality, and highway driving in Nevada, particularly in near-downwind areas of Esmeralda, Mineral, and Nye Counties. Similarly, there is some potential for ash from Cascade volcanoes in northern California (Lassen Peak and Mt. Shasta areas) and Oregon to affect airplanes, air quality, and highway driving in northern Nevada, particularly Washoe, Humboldt, Pershing, and Elko Counties. Geologic evidence of past eruptions from these volcanoes, recognized as ash deposits of particular ages and distinct chemical compositions, is abundant in Nevada. Volcanic gases associated with phreatic eruptions could pose a localized threat of asphyxiation to humans in poorly ventilated spaces in the

immediate vicinity of these vents. Several CO_2 deaths occurred at Mammoth Mountain, California when a skier and rescuers became trapped in a snow pocket that was filled with gas. However, it is noted that the ski resorts in that region are located in close proximity to volcanoes.

Volcanoes are considered a ~~L~~low Risk" hazard in Nevada in part because the consequences are likely to be minimal for the types of eruptions that would affect Nevada. The probability for this hazard is low. Mitigation actions are limited to public awareness and evacuation procedures at the local level.

3.3.20 **Wildfire** (High Risk)

Figure 3-33. Wildland Urban Interface Fire outside of Pioche, NV

3.3.20.1 *Nature*

A wildfire is a type of fire that spreads by consumption of vegetation. It often begins unnoticed, spreads quickly, and is usually signaled by dense smoke that may be visible from miles around. Wildfires can be caused by human activities such as arson or campfires or by natural events such as lightning. Wildfires are not confined to forests but can easily ignite in other areas with ample vegetation such as sagebrush or cheatgrass. Additionally, wildfires can be classified as urban fires, interface or intermix fires.

Nevada is susceptible to weather that may range from prolonged periods of drought to periods that are marked by above average precipitation. These weather fluctuations result in millions of acres of dead or dying vegetation, which rapidly dry out under normal summer weather conditions. The dry, hot conditions and windy weather patterns characteristic of Nevada's summers combine with vegetation conditions that fuel fast-moving, high-intensity wildland fires.

The following three factors contribute significantly to wildfire behavior and can be used to identify wildfire hazard areas.

- **Topography:** Topography is the configuration of the earth's surface, including its relief and the position of its natural and man-made features. Topography has a direct bearing on fire behavior. As slope increases, the rate of wildfire spread increases. A slope's aspect correlates with the amount of moisture, quantity and type of vegetation. As slope increases, the rate of wildfire spread increases. South-facing slopes are also subject to more solar radiation, making them drier, thereby intensifying wildfire behavior. However, a ridge-top may stop a wildfire from spreading, since fire spreads more slowly or may be unable to spread downhill.
- **Fuel:** Fuel characteristics determine the potential fire intensity, and influence the rate of spread. The type and condition of vegetation play a significant role in the occurrence and spread of wildfires. Certain types of plants are more susceptible to burning or burn with greater intensity. Dense or overgrown vegetation increase the amount of combustible material available to fuel the fire (referred to as the ~~"fu~~el load"). The ratio of living to dead plant matter is also important. The risk of fire is increased significantly during periods of prolonged drought, as the moisture content of both living and dead plant matter decreases. The fuel's continuity, both horizontally and vertically, is also an important factor.
- **Weather:** The most variable factor affecting wildfire behavior is weather. Temperature, humidity, wind, and lightning can affect both the ignition and spread of fire. Extreme weather, such as high temperature and low humidity, can lead to extreme wildfire activity. By contrast, cooling and higher humidity often reduce wildfire occurrence and make containment easier. Wind has the greatest impact on fire behavior of any of the weather factors. The passage of a warm front will usually bring a wind direction shift of 45 to 90 degrees. The passage of a cold front will shift wind direction from less than 45 degrees to as much as 180 degrees. Great Basin heating causes downslope winds in Nevada. As wind flows downslope in the

atmosphere it is compressed, becoming warmer and dryer. This causes the fuels to dry out. As the temperature increases, wind speed may reach 50 to 70 miles per hour. Thunderstorms are another common extreme weather condition in Nevada. A thunderstorm's effect may extend 25 to 30 miles from the actual storm. A downburst is the collapse of a thunderstorm, causing cool air to be released in a downward direction. When this occurs, it adversely affects fire behavior and fire suppression efforts.

The frequency and severity of wildfires also depend on other hazards, such as lightning, drought, and infestations. If not promptly controlled, a wildfire may grow into an emergency or disaster. Fires that break out immediately following earthquakes can be particularly devastating, because the earthquake may have impaired the ability of first responders to reach or combat an urban or urban interface fire. Even small fires can threaten or destroy lives, resources, and improved properties. In addition to affecting people, wildfires may severely affect wildlife, livestock, and pets. Such events may require emergency watering/feeding, evacuation, and shelter. After the wildfire season of 2006, Elko issued a second hunting season to reduce the population of wildlife that was dying from the lack of vegetation.

The indirect effects of wildfires can be catastrophic. In addition to stripping the land of vegetation and destroying forest resources, intense fires can harm the soil, waterways, and the land itself. Soil exposed to intense heat may lose its capability to absorb moisture and support life. Exposed soils erode quickly and enhance siltation of rivers and streams, increasing flood potential, harming aquatic life, and degrading water quality. Lands stripped of vegetation are also subject to increased debris-flow hazards.

3.3.20.2 *History*

In Nevada, particularly in northern Nevada, wildfires are a common yearly event. Nevada's fire season starts in May and ends in October, but wildfires can occur at any time of the year depending on fire and weather conditions.

Nevada's fire regime is outside the range of historical variation which means that wildland fires have become larger, more destructive, and more frequent. In the past fifty years there have been eight large fire seasons in Nevada. Five of these fire seasons have occurred in the past eight years. Since the record fire season of 1999, over five million acres of Nevada's forest, watersheds and rangelands have burned. These fires have devastated ranches, watersheds and wildlife habitat. Additionally, large fires destroy native plant communities that are replaced by invasive species such as cheatgrass and red brome. In many cases these invasive species are more fire prone than native species and fuel larger, more intense fires.

In recent years this fire-invasive species-fire cycle is accelerating and posing serious threats to the health of some Nevada ecosystems.

The spread of these invasive annual plants perpetuates the cycle of destructive fires and the loss of native plant communities.

Of the ten worst fire seasons since 1960 in terms of acres burned, five of those occurred between 1999 and 2006. The 2006 fire season saw 1,274 wildfires that burned 1,348,871 acres in the State of Nevada. These fires threatened not only homes, but plant and animal species.

Table 3-30 presents a brief history of some of the most destructive Nevada wildfires in the last 8 years. For 2010 to 2012, only fires over 1000 acres are listed in this report.

Table 3-30. Recent Wildfire History

Place	Date	Description
Washoe County	2004	Verdi Fire Complex. This fire was located west and northwest of Reno. The blaze burned 1,094 acres west of Peavine Peak and cost $980,000 to fight.
Carson City	2004	Waterfall Fire. This fire was located in Kings Canyon near Carson City. This fire burned more than 300 acres, threatened 350 homes and exhibited extreme behavior. About 200 personnel responded to the fire that caused evacuation of 50 homes closest to the flames.
Clark County	2004	Robbers Fire. This fire burned near Mount Charleston in Clark County. The 1,000-acre Robbers fire resulted in the evacuation of about eight residential structures and Camp Stimpson, a Girl Scout camp, and the Spring Mountain Youth Camp, a juvenile detention center. In addition, 400 homes were under voluntary evacuation near Kyle Canyon.
Carson City, Washoe Co.	2004	Andrew Lane Fire. The fire was located between Carson City and Reno. At the time the FEMA money was approved, the fire had burned more than 1,000 acres and a few residences. The fire threatened hundreds of homes in the community of Pleasant Valley. An estimated 300 people were evacuated.
Clark County	2005	Goodsprings Fire. This fire burned 31,600 acres of land near Las Vegas. It threatened Red Rock Conservation area, Mountain Springs, and Mt. Potosi area. It was started by lightning.
Elko County	2005	Vor-McCarty Fire. This fire burned near Elko, in the northeastern part of the state, and threatened the Upper Ten Mile subdivision. It consumed more than 500 acres and threatened several historical structures.
Elko County	2005	Chance Fire. The fire, which started August 28, consumed more than 6,000 acres and resulted in the voluntary evacuation of approximately 200 residents. The fire burned near the communities of Ryndon, Osino and Elburz in Elko County.
Elko County	2006	Suzie Fire. This fire burned more than 78,300 acres about five miles from Elko. This fire threatened rangeland, homes, and highways. A five-member strike team from California, composed of personnel and

Table 3-30. Recent Wildfire History		
Place	**Date**	**Description**
		engines from fire departments in Sacramento, Placer and Nevada counties was involved in fighting this fire.
Humboldt	2006	Oregon Fire. This fire burned more than 160 square miles of Nevada rangeland near the Oregon border. Also, this fire on the Oregon side threatened the major transmission lines that carry power between California and the Pacific Northwest.
Washoe County, Carson City	2006	Linehan Fire Complex. This fire burned about 8,000 acres, threatening homes in Carson City. One federal Type I incident response team moved in to battle the 8,000-acre Sierra-Tahoe complex of fires in western Nevada near Reno and Carson City.
Washoe County	2006	The Verdi Fire burned 6000 acres west of Reno, Nevada threatening the Somersett home subdivisions. It significantly depleted the winter forage food for the deer in this area.
Elko County	2006	The Mud Fire on the outskirts of Elko burned more than 3,000 acres . It threatened 300 homes and forced mandatory evacuations of about 1,000 persons. It was a human–caused fire that threatened businesses and a number of state and Federal facilities. A Fire Management Assistance Grant (FMAG) was approved August 23, 2006.
Washoe County	2006	The Pine Haven Fire. This fire was caused by power lines and windy conditions. Firefighters held the blaze to approximately 300 acres with wildland fire engines, structure fire engines, water tenders, several hand crews and other equipment. Although the fire briefly threatened homes near Caughlin Ranch near Reno, no structures were damaged or lost during the fire.
Washoe County	2007	The Hawkens Fire was caused by construction crews working in the Caughlin Ranch subdivision near Reno. The fire burned 2,710 acres in the wildland-urban interface and threatened numerous homes and structures.
Elko County	2007	The Red House Complex of multiple fires in Elko County burned 71,340 acres total.
Humboldt County	2007	The Kelly Creek fire burned 18,806 acres and threatened several rural ranches in the Humboldt County area.
Elko County	2007	The West Basin Fire burned 61,070 acres and threatened several local ranches in the area.
Elko County	2007	The Eccles Fire burned 19,959 acres and threatened several ranches and structures.
Elko County	2007	The Murphy Complex, the Wine Cup Complex, and the Highway 93 Complex fires together burned 648,154

Table 3-30. Recent Wildfire History		
Place	**Date**	**Description**
		acres. Resources in the surrounding area and around the state were at maximum drawdown.
Nye County	2008	The Elkhorn fire burned 6,198 acres.
Washoe County	2008	The Gooseberry fire burned 3,042 acres and threatened several outbuildings.
Elko County	2008	The East Slike Rock Ridge fire burned 40,937 acres and threatened the town of Jarbidge.
Washoe County	2009	The Red Rock Fire burned 10,549 acres and threatened several subdivisions in the Red Rock community.
Churchill County	2009	The Hoyt fire burned 10,670 acres. There was one pilot fatality in this fire.
Washoe County	2010	The Rock Creek fire burned 5,298 acres
Pershing County	2010	Seven Troughs fire burned 3,852 acres
Elko County	2010	Bailey fire burned 2,681 acres
Eureka County	2010	Grass Valley fire burned 1,300 acres
Elko County	2011	Salmon fire burned 4,780 acres
Douglas County	2011	Ray May fire burned 3,895 acres
Washoe County	2011	Great Stone fire burned 2,377 acres
Lincoln County	2011	Jumbo fire burned 1,721 acres
Lander County	2011	Ellison fire burned 1,041 acres
Lincoln County	2011	Vigo fire burned 12,087 acres
Pershing County	2011	Willow Canyon fire burned 1,091 acres
Elko County	2011	Wells fire burned 1,496 ac
Lyon County	2011	Burbank fire burned 1,062 acres
Humboldt County	2011	Hot Springs fire burned 38,055 acres
Elko County	2011	Indian Creek fire burned 116,875 acres
Elko County	2011	Izzenhood fire burned 42,190 acres
Elko County	2011	Chukar Canyon fire burned 51,390 acres
Humboldt County	2011	Eden Valley fire burned 24,000 acres
Humboldt County	2011	China Garden fire burned 18,468 acres
Humboldt County	2011	Tom Basin fire burned 5,125 acres
Elko County	2011	Signboard Pass fire burned 2,363 acres
Lander County	2011	Fire Creek fire burned 2,000 acres
Humboldt County	2011	Big Antelope fire burned 11,624 acres
Washoe County	2011, November 18	Caughlin fire burned 1,935 acres, one fatality and 29 residences destroyed
Washoe County	2012, Jan 18	Washoe Drive fire burned 3,177 acres, one fatality, 34 residences destroyed
Clark County	2012	White Rock fire burned 1,086 acres
Lincoln County	2012	Pahroc fire burned 4,123 acres
Lander County	2012	Antelope Complex burned 6,007 acres
Churchill County	2012	Wall fire burned 17,200 acres
Douglas County	2012	TRE fire burned 7,152 acres
Douglas County	2012	Preacher fire burned 1,070 acres

Table 3-30. Recent Wildfire History		
Place	**Date**	**Description**
Lincoln County	2012	White Rock fire burned 6,355 acres; two fatalities in Tanker 11 crash
Lyon County	2012	Weeks fire burned 3,871 acres
White Pine County	2012	North Schell fire burned 12,047 acres
Pershing fire	2012	Mine fire burned 1,010 acres
White Pine County	2012	Pinto fire burned 4,000 acres
Lincoln County	2012	Boyd fire burned 1,815 acres
Humboldt County	2012	Buffalo fire burned 2,478 acres
White Pine County	2012	Range fire burned 4,600 acres
White Pine	2012	Egan fire burned 7,238 acres
Elko County	2012	20 mile fire burned 13,149 acres
Elko County	2012	Palisades fire burned 1,435 acres
Douglas County	2012	Springs fire burned 1,193 acres
Pershing County	2012	Jupiter fire burned 1,600 acres
Elko County	2012	Chimney fire burned 4,597 acres
Lincoln County	2012	Gregerson fire burned 7,300 acres
Lincoln County	2012	Basin fire burned 6,057 acres
Lincoln County	2012	Dell fire burned 23,680 acres
Elko County	2012	Willow fire burned 43,271 acres
Humboldt County	2012	Holloway fire burned 460,850 acres
Elko County	2012	Lutz fire burned 1,200 acres
Eureka County	2012	Frazier fire burned 12,091 acres
Humboldt County	2012	Slumbering fire burned 1,500 acres
Humboldt County	2012	Eleven fire burned 43,271 acres
Eureka County	2012	Four Tanks fire burned 1,035 acres
Lander County	2012	Gilbert fire burned 31,652 acres
Elko County	2012	Homer fire burned 6,000 acres
Elko County	2012	Lime fire burned 7,590 acres
Elko County	2012	Browns Gulch fire burned 12,500 acres
Lincoln County	2012	Kane fire burned 4,246 acres
Elko County	2012	Greenhorn fire burned 2,680 acres
Lander County	2012	Cain fire burned 7,402 acres
Humboldt County	2012	Long Canyon 25,000 acres
Elko County	2012	Stud fire burned 6,738 acres
Lander County	2012	Indian Creek fire burned 2,532 acres
Humboldt County	2012	Hanson fire burned 12,469 acres
Elko County	2012	Mustang fire burned 16,797 acres
Humboldt County	2012	Buckskin fire burned 6,000 acres
Humboldt County	2012	Coyote Point fire burned 5,500 acres
Douglas County	2012	Carter Springs fire burned 3,454 acres

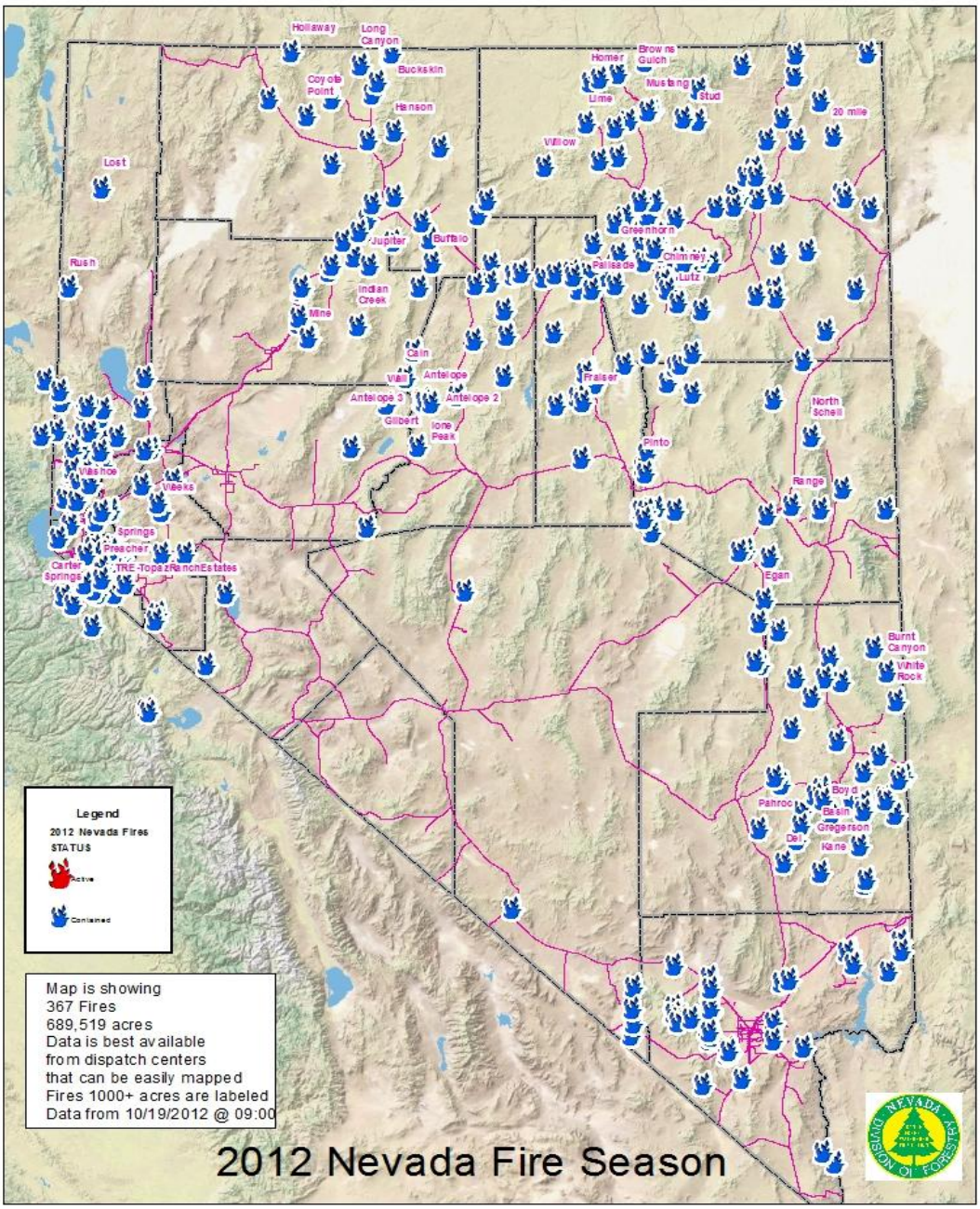


Figure 3-34. Locations of 2012 Nevada Wildfires

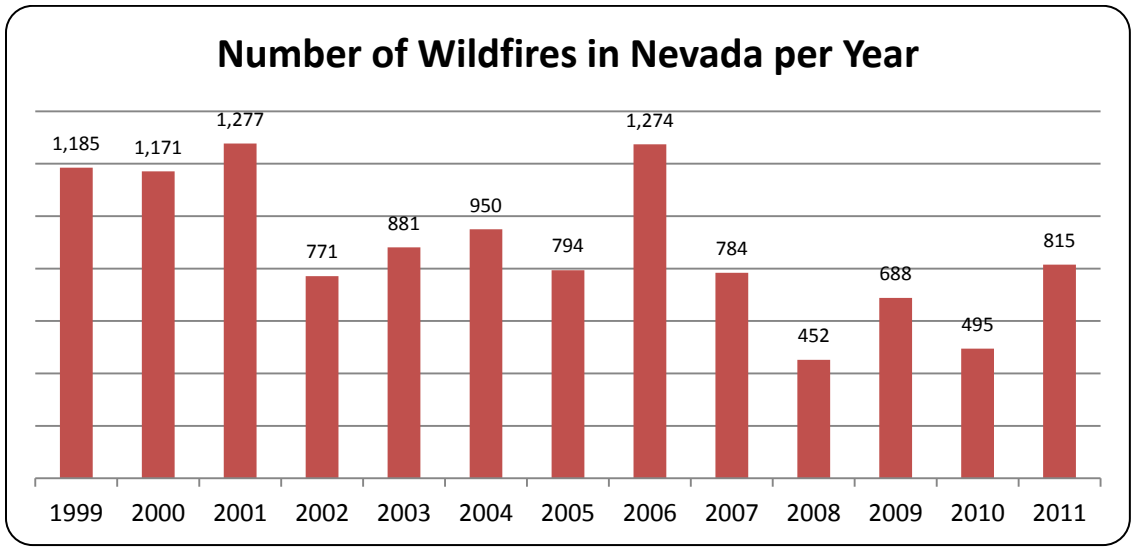


Figure 3-35. Number of Wildfires in Nevada per Year 1999-2011

Mike Dondero, Fire Management Officer; Source: Western Great Basin Geographic Area Coordination Center

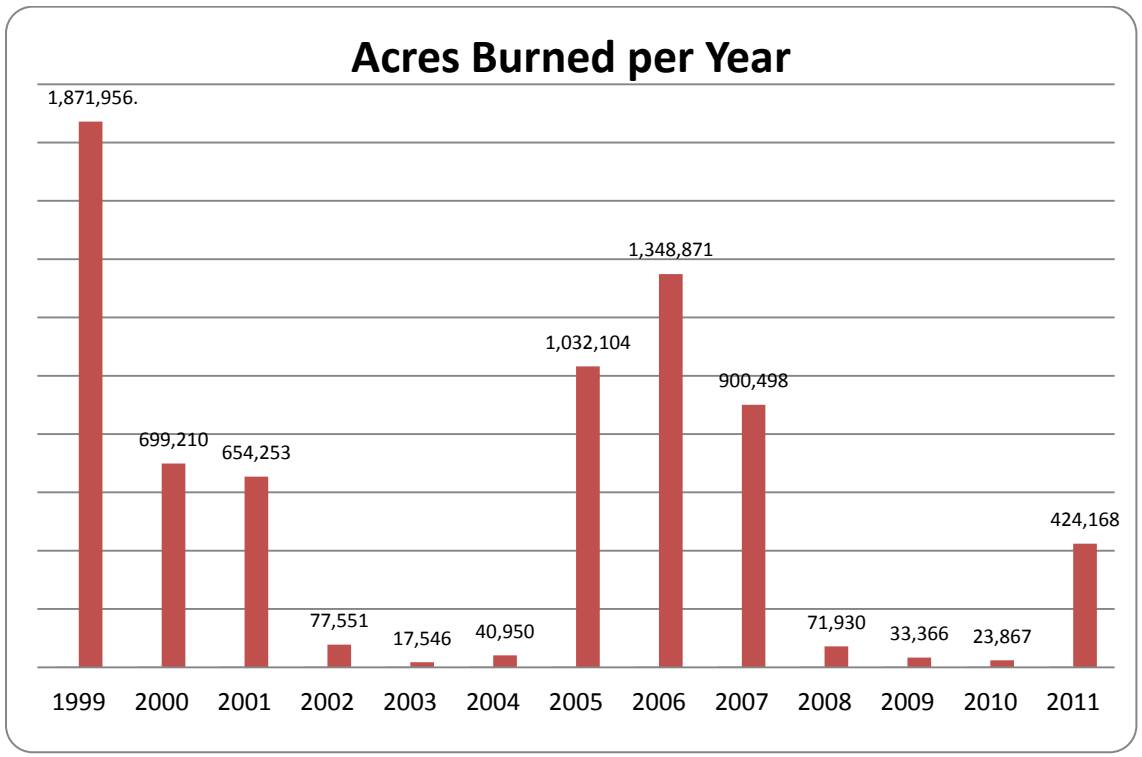


Figure 3-36. Acreage Burned in Nevada 1999-2011

Mike Dondero, Fire Management Officer; Source: Western Great Basin Geographic Area Coordination Center

http://gacc.nifc.gov/wgbc/predictive/intelligence/intelligence.htm

3.3.20.3 *Location, Severity, and Probability of Future Events*

The entire State of Nevada is at risk to wildfires due to fuel-loading, ignition risk, weather, and topography. No specific area of the State is immune to this risk. The State of Nevada Division of Forestry is the lead agency for wild-land urban interface fire planning, mitigation, and response. The agency's mission is to provide professional natural resource and fire services to Nevada's citizens to enhance and protect forest, rangeland, and watershed values; conserve endangered plants and other native flora; and provide effective statewide fire protection and emergency management.

In a collaborative effort, government agencies at all levels, tribes, communities, volunteers, and a variety of other participants have reduced the threats posed by wildland fire since adoption of the Western Governor Association's A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment - *10-Year Strategy, Implementation Plan*.

The revision of the *10-Year Strategy* in December of 2006 gives direction for a collaborative framework that crosses agency jurisdictions and program boundaries. It strongly emphasizes the following:

- Information sharing and monitoring of accomplishments and forest conditions to improve transparency
- Long-term commitment to maintaining the essential resources for project implementation
- Landscape-level approach to the restoration of fire adapted ecosystems
- Use of fire as a management tool (wildland fire use, prescribed fire)
- Improve collaboration on all levels consistent with the *10-Year Strategy,* the *Implementation Plan*, and individual agency goals and objectives.

The severity of wildfires in the State of Nevada has been determined by the Nevada Hazard Mitigation Planning Committee (NHMPC) using a hazard ranking system and vulnerability rating explained in section 3.2.1 and 3.2.2. The rating for wildfires in Nevada is a ~~H~~High Risk" hazard. Wildfire is being addressed by a variety of strategies and projects in the State.

Nevada's Extreme Wildfire Hazard Communities. A key element of the **Healthy Forests Initiative** announced by the White House in 2002 is the implementation of core components of the ***National Fire Plan Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-year Comprehensive Strategy***. Federal agencies and western state governors adopted the Plan in the spring of 2002 in collaboration with county commissioners, state foresters, and tribal officials. The Plan calls for more active forest and rangeland management to reduce the threat of wildfire in the wildland urban interface.

The Healthy Forest Restoration Act (H.R. 1904) was signed into law in December of 2003. The act creates provisions for expanding the activities outlined in the National Fire Plan. During this year the Nevada Fire Safe Council received National Fire Plan funding through the Department of Interior Bureau of Land Management to conduct a

Community Risk/Hazard Assessment in at-risk communities across Nevada. The communities to be assessed were among those named in the 2001 Federal Register list of Communities-at-Risk within the vicinity of Federal lands (66 FR 160). The list identified Nevada communities adjacent to Federal lands that are most vulnerable to wildfire threat in Nevada.

During 2004, field teams comprised of fire behavior specialists, foresters, rangeland fuels specialists, and field technicians visited over 250 communities in Nevada's seventeen counties to assess both the risk of ignition and the potential fire behavior hazard. Using procedures accepted by Nevada's wildland fire agencies, these specialists focused their analysis on the wildland urban interface areas where homes and wildlands meet. This effort was known as the Nevada Community Wildfire Risk/Hazard Assessment Project. The reports generated by the Nevada Community Wildfire Risk/Hazard Assessment Project for each of the 17 counties in Nevada, as well as two reports for Lake Tahoe communities and a Fire-Safe plan for Virginia City Highlands may all be viewed on the website below:

http://www.rci-nv.com/home/rci-reports/

Upon completion of the Community Wildfire Protection Plans (CWPP), the plans were approved by County Commissioners, local fire chiefs, and the State Forester. These plans serve as the basis for risk assessment ratings and development of wildfire mitigation strategies for the assessed communities.

Specific goals of the Nevada Community Risk/Hazard Assessment Project in developing the CWPPs are the following:

- Reduce the threat of wildland fire to the communities.
- Raise the level of public awareness about ignition risk factors and fire-safe practices in the wildland urban interface.
- Improve local coordination for suppression activities.
- Identify and pursue firefighting resource needs (equipment and infrastructure).
- Describe proposed risk and hazard mitigation projects in enough detail to aid communities in applying for future implementation funds.

Source: *Nevada Community Wildfire Risk / Hazard Assessment Project*, Resource Concepts, Inc., 1.0 Introduction

The Community Risk/Hazard Assessments were conducted systematically. The assessment teams observed and recorded the factors that significantly influence the risk of wildfire ignition along the wildland-urban interface, and inventoried features that can influence hazardous conditions in the event of a wildfire. Interviews with local fire agency and emergency response personnel were completed to assess the availability of suppression resources and identify opportunities for increased community preparedness. A description of the existing fuel hazard and fire behavior potential was discussed and presented with photos for each community.

Four primary factors that affect potential fire hazard were assessed to arrive at the community hazard assessment score:

1. Community design

2. Structure survivability
3. Availability of fire suppression resources
4. Physical conditions such as the vegetative fuel load and topography

An ignition risk rating of low, moderate, or high was assigned to each community. The rating was based upon historical ignition patterns, interviews with local fire personnel, field visits to each community, and professional judgment based on experience with wildland fire ignitions in the Great Basin.

The results of each community assessment were formatted to facilitate ease of reference and reproduction for individual communities. Each community was mapped and recommendations to improve fire safety were described and summarized in table form. Summary sheets highlighting important aspects of Defensible Space and Homeowner Responsibilities are formatted for widespread distribution. These tools will aid local, state and federal agencies in strategic planning, raising public awareness, and seeking funding for future risk and hazard reduction projects. Mitigating the risks and hazards identified by these assessments is crucial not only to the long term goals of the National Fire Plan, but also to the short and long-term viability of Nevada's communities, natural resources, infrastructures, and watersheds. All Nevada Counties have signed and approved their plans. There are additional assessments of wildfire risk that have been completed to address the rest of the state outside the communities. There is also a Western States Wildfire Risk Assessment completed in December 2012 that will be available to Federal, State and Local governments.

The initial CWPP assessment covered communities at risk as defined in the 2001 Federal Register in the interface, intermix and occluded conditions. To date, Carson City has updated its CWPP to reflect current fuels management work that has been completed. This assessment simply represented a snapshot in time of the conditions in the identified communities. However, wildland fire conditions continue to change and new and existing communities impact the wildland environment causing a need for ongoing collaborative review and update of the original assessments as well as a need for creation of new assessments. Currently, the Bureau of Land Management has contracted with a company to conduct the second assessment, the scope of which will cover the rural condition as well as areas of the state that were not included in the first assessment. Although the Crosswalk recommends that the NHMPC update the status of CWPPs to 2010 if possible, the CWPPs are the responsibility of the local jurisdictions–all we can do is monitor them, make recommendations, and support them in their planning and mitigation efforts. Grants are being provided for many ongoing mitigation efforts such as fuels reduction programs and awareness, education and outreach programs that are ongoing in many communities of extreme risk as shown in the updated version of Table 3-31 below.

The preparation of Community Wildfire Protection Plans (CWPPs) for each county in the State is a part of the State of Nevada Division of Forestry's fire planning, mitigation, and response. Ed Smith and Sonya Sistare from the University of Nevada Cooperative Extension reviewed these CWPPs and prepared a report, *Course of Study Reports for Nevada's Extreme Wildfire Hazard Communities,* outlining the risk factors that identify

communities with wildfire risks. The risk factors used to rate the State of Nevada's communities are the following:

1. Contributing factors
    a. History of lightning strikes
    b. Camping activities
    c. High level of visitors/recreational activities
    d. Understory provides receptive fuel bed for ignition
    e. Thick brush/trees provide receptive fuel bed for ignition
    f. Improperly maintained power line corridors
    g. High fuel loads
    h. High winds
2. Community design
    a. Wildland-urban interface condition
    b. Number of homes
    c. Ingress/egress
    d. Width of road
    e. Accessibility
    f. Secondary roads
    g. Visible street signs
    h. Visible address
    i. Utilities-ignition risk
3. Construction materials
    a. Non-combustible roof
    b. Non-combustible siding
    c. Unenclosed structures
4. Defensible space
    a. Lot size
    b. Defensible space
5. Fire behavior
    a. Fuels
    b. Fire behavior
    c. Slope
    d. Aspect
6. Suppression capability
    a. Available water source
    b. Fire protection
    c. Primary fire protection service
    d. Supporting fire protection service
    e. Additional support
7. Additional Factors
    a. Existing Fire Safe Council Chapter

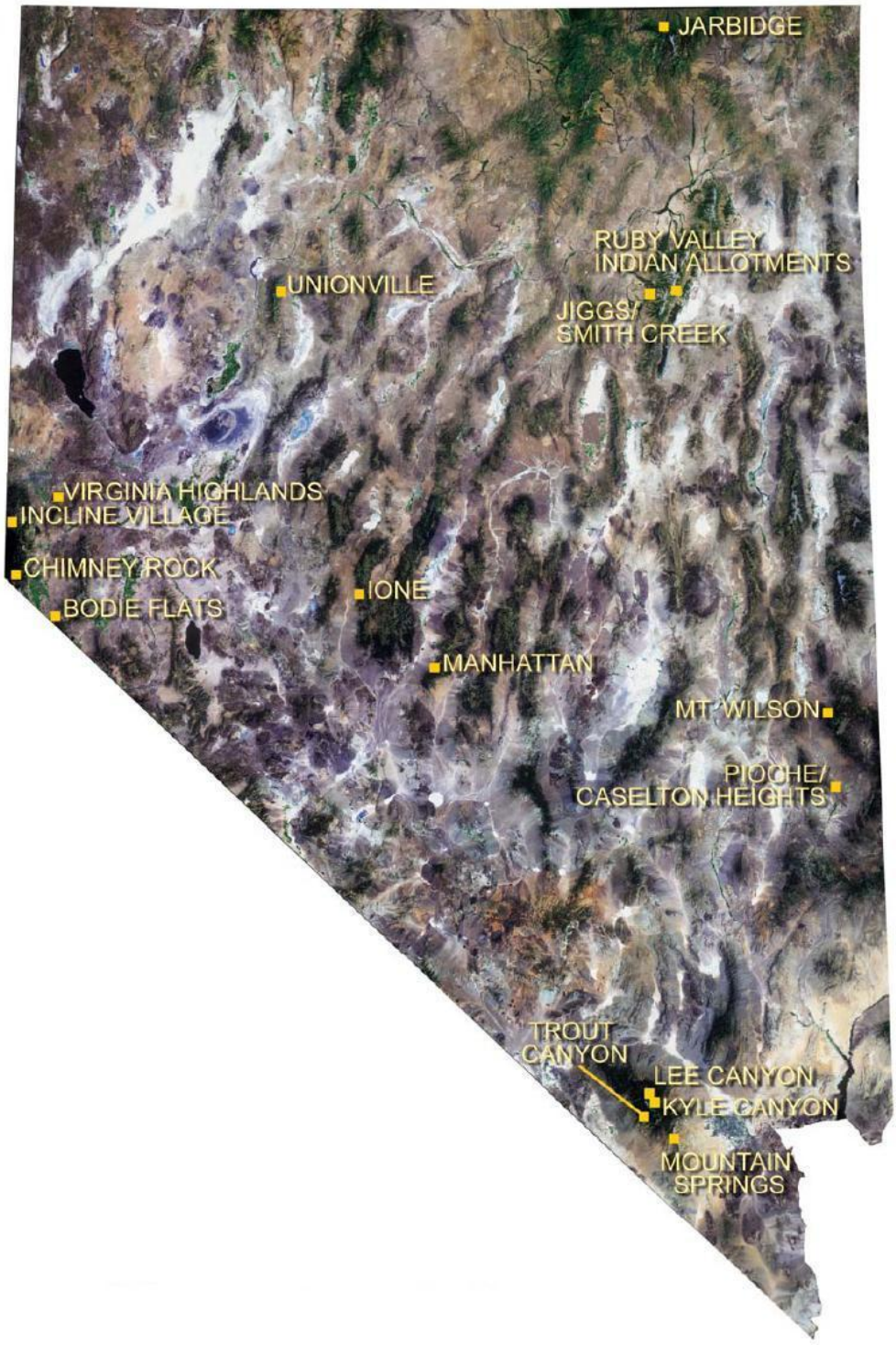


Figure 3-34. Map Showing Communities with Extreme Wildfire Risk

Table 3-31 below lists all the communities that were rated using the information provided by the CWPPs, grouped by county, and the hazard rating for each community, as well as a column to indicate ongoing or completed fuels reduction programs and/or public awareness and education projects in each community in the past 3 years.

Table 3-31. Wildfire Hazard Ratings for Nevada Communities by County	**Wildfire mitigation programs completed in 2010-2012 period: 1. Fuels reduction projects 2. Education, awareness, outreach programs**	
County/Community	**Hazard rating**	**Type**
Carson City		
Clear Creek	Extreme	2
Carson Colony-Voltaire Canyon	High	2
Edmonds-Prison Hill	High	2
Kings Canyon-Upper	High	2
Lakeview	High	2
Mexican Dam	High	2
North Carson	High	2
Pinion Hills	High	2
Ash Canyon-WNCC	Moderate	
C-Hill	Moderate	
Stewart-South Carson	Moderate	
Timberline	Moderate	
Kings Canyon-Lower	Low	
Churchill		
Eastgate	High	2
Cold Springs	Moderate	2
Middlegate	Moderate	
Fallon	Low	
Fallon Naval Air Station	Low	
Fallon Outskirts	Low	
Clark		
Kyle Canyon Summer Home Area	Extreme	1,2
Lee Canyon Summer Home Area	Extreme	1,2
Mountain Springs	Extreme	1,2
Trout Canyon (not geocoded)	Extreme	1,2
Cold Creek (not geocoded)	High	1,2
Nelson	High	2
Torino Ranch (not geocoded)	High	2
Cactus Springs	Moderate	
Goodsprings	Moderate	
Moapa Valley	Moderate	1,2
Sandy Valley	Moderate	2
Searchlight	Moderate	2
Arden	Low	
Blue Diamond	Low	2
Boulder City	Low	
Bunkerville	Low	2
Cal-Nev-Ari	Low	2
Cottonwood Cove (not geocoded)	Low	
Glendale	Low	2
Henderson	Low	2
Indian Springs	Low	2
Las Vegas	Low	
Laughlin	Low	
Logandale	Low	1,2
Mesquite	Low	2
North Las Vegas	Low	
Overton	Low	1,2
Palm Garden Estates (not geocoded)	Low	
Primm	Low	
Sloan	Low	

County/Community	Hazard rating	Type
Douglas		
Bodie Flats (not geocoded)	Extreme	2
Chimney Rock (not geocoded)	Extreme	1,2
China Springs (not geocoded)	High	2
Double Springs (historical)/Spring Valley	High	2
Elk Point/Zephyr Heights/Round Hill	High	1,2
Fish Springs (not geocoded)	High	2
Genoa	High	2
Glenbrook	High	1,2
Holbrook Junction	High	1,2
Kingsbury	High	1,2
Job's Peak Ranch (not geocoded)	High	1,2
Logan Shoals (not geocoded)	High	1
North Foothill Road Corridor (not geocoded)	High	2
Pine Nut Creek (not geocoded)	High	2
Sheridan	High	2
Skyland/Cave Rock	High	1,2
Topaz Ranch Estates	High	1,2
Alpine View (not geocoded)	Moderate	
Dresslerville	Moderate	
Indian Hills/Jacks Valley	Moderate	1,2
Johnson Lane	Moderate	
Ruhenstroth (not geocoded)	Moderate	
Stateline	Moderate	1,2
Topaz Lake	Moderate	2
East Valley (not geocoded)	Low	
Gardnerville	Low	2
Gardnerville Ranchos	Low	2
Minden	Low	2
Elko		
Jarbidge	Extreme	2
Jiggs/Smith Creek	Extreme	2
Ruby Valley Indian Reservation	Extreme	2
Adobe Heights (not geocoded)	High	2
Adobe Ranchos (not geocoded)	High	2
Contact	High	2
Deeth/Starr Valley	High	2
Lamoille	High	2
Lee/South Fork Indian Reservation	High	2
Lucky Nugget I & II (not geocoded)	High	2
Midas	High	2
Mountain City	High	2
Osino	High	2
Ruby Lake Estates	High	2
Ten Mile (not geocoded)	High	2
Tuscarora	High	2
Carlin	Moderate	2
Currie	Moderate	
Elburz	Moderate	
Elko	Moderate	2
Gold Creek- moderate	Moderate	
Hidden Valley/Coal Mine (not geocoded)	Moderate	
Humboldt Ranchettes (not geocoded)	Moderate	
North Fork	Moderate	
Oasis	Moderate	
Owyhee	Moderate	
Plot Valley (not geocoded)	Moderate	
Ruby Valley	Moderate	2
Ruby Lake National Wildlife Refuge & Hatchery	Moderate	2
Ryndon	Moderate	
Spring Creek	Moderate	2
Wild Horse Estates- (not geocoded)	Moderate	
Jackpot	Low	2

County/Community	Hazard rating	Type
Montello	Low	
Wells	Low	2
West Wendover	Low	
Charleston	Rural	
Clover Valley	Rural	
Independence Valley (not geocoded)	Rural	
Goose Creek- rural (not geocoded)	Rural	
Esmeralda		
Gold Point	Moderate	
Goldfield	Moderate	2
Lida	Moderate	2
Silver Peak	Moderate	
Dyer/Fish Lake Valley	Low	
Eureka		
Eureka	High	2
Beowawe	Moderate	
Crescent Valley	Low	
Dunphy	Low	
Shoshone		
Humboldt		
McDermitt	High	2
Denio	Moderate	
Golconda	Moderate	
Paradise Valley	Moderate	
Valmy	Moderate	
Winnemucca	Moderate	2
Denio Junction	Low	
Paradise Hill/Paradise Ranchos	Low	
Quinn River Crossing	Rural	
Lander		
Austin	High	2
Kingston	High	2
Battle Mountain	Low	2

County/Community	Hazard rating	Type
Hilltop	Low	
Battle Mountain	Low	2
Grass Valley	Rural	2
Lincoln		
Pioche/Caselton Heights	Extreme	1,2
Ursine/Eagle Valley	High	1,2
Alamo	Moderate	2
Caliente	Moderate	2
Panaca	Moderate	2
Rachel	Moderate	2
Ash Springs	Rural	2
Hiko	Rural	2
Lyon		
Silver City	High	2
Dayton	Moderate	2
Mark Twain Estates	Moderate	2
Mason Valley	Moderate	
Mound House (historical)	Moderate	2
Smith Valley	Moderate	2
Wabuska	Moderate	
Weed Heights	Moderate	
Weeks (historical)/Fort Churchill	Moderate	
Fernley	Low	
Silver Springs	Low	
Stagecoach	Low	
Yerington	Low	
Mineral		
Marietta	High	2
Luning	Moderate	
Mina	Moderate	
Schurz	Moderate	
Walker Lake	Moderate	
Hawthorne	Low	

County/Community	Hazard rating	Type
Nye		
Ione	Extreme	2
Manhattan	Extreme	2
Belmont	High	2
Amargosa Valley	Moderate	2
Beatty	Moderate	2
Carvers	Moderate	2
Gabbs	Moderate	2
Hadley/Round Mountain	Low	2
Pahrump	Low	1,2
Tonopah	Low	1,2
Pershing		
Unionville	Extreme	2
Humboldt	High	2
Imlay	Moderate	
Lovelock	Moderate	
Mill City	Moderate	
Oreana	Moderate	
Rye Patch	Moderate	2
Storey		
Virginia City Highlands	Extreme	1,2
Gold Hill	High	1,2
Virginia City	High	1,2
Lockwood	Moderate	
Washoe		
Crystal Bay	Extreme	1,2
Incline Village	Extreme	1,2
Antelope Valley (not geocoded)	High	2
Rancho Haven (not geocoded)	High	2
Red Rock (not geocoded)	High	2
Warm Springs Valley (not geocoded)	High	2
Anderson Acres (not geocoded)	Moderate	
Cold Springs	Moderate	
Galena (not geocoded)	Moderate	1,2
Gerlach	Moderate	
Golden Valley	Moderate	
Lemmon Valley	Moderate	
Mogul/I-80 Corridor West	Moderate	
Nixon	Moderate	
Palomino Valley (not geocoded)	Moderate	
Pleasant Valley	Moderate	
Reno	Moderate	
Reno Northwest	Moderate	
Reno Southeast	Moderate	
Silver Knolls (not geocoded)	Moderate	
Spanish Springs	Moderate	
Steamboat	Moderate	
Sun Valley	Moderate	
Sutcliffe	Moderate	
Verdi	Moderate	
Washoe City	Moderate	
Washoe Valley East	Moderate	
Empire	Low	
Reno Southwest	Low	
Reno-Stead	Low	
Sparks	Low	
Wadsworth	Low	
White Pine		
Cherry Creek	High	2
Baker	Moderate	
Ely	Moderate	1,2
Lund	Moderate	2
McGill	Moderate	2
Pleasant Valley (historical)	Moderate	
Preston	Moderate	
Ruth	Moderate	
Shoshone	Rural	
Strawberry (historical)	Rural	

Total Number of Communities Rated	230
Number of Communities Rated Extreme Wildfire Hazard	17
Number of Communities Rated High Wildfire Hazard	55
Number of Communities Rated Moderate Wildfire Hazard	98
Number of Communities Rated Low Wildfire Hazard	51
Rural Communities (not rated but assessed)	9

Members of Nevada's ~~L~~iving with Fire" program (administered by the Nevada Cooperative Extension) did a study of Nevada's Extreme- and High-Risk communities to determine the possible effectiveness of education and increased awareness programs in reducing wildfire risk in those communities as already identified by the CWPP program. This identified not only those extreme- and high-risk communities that would most likely benefit from targeted education and increased awareness programs, but also prioritized the communities where grant resources would likely have the most positive effects in reducing wildfire risks. This laid the groundwork for ongoing statewide multiagency wildfire education and awareness programs that are now being implemented in several of the extreme/high-risk communities, supported by both state and federal grants.

The Nevada Fire Safe Council is a coalition of concerned citizens who share a common interest in reducing the loss of lives, property, and valuable natural resources to wildfire. They work with affiliated communities to identify and administer grant funding from federal, state, local, and private sources to reduce the risk of catastrophic loss due to wildfire. They maintain a web site designed to encourage development of Fire Safe chapters across Nevada and in the Tahoe Basin to increase community awareness, enhance understanding, and create a fire safe community culture through a combination of targeted fuels –reduction projects often coupled with localized community education, outreach and awareness programs, as well as statewide programs such as the Living with Fire website to disseminate public information about wildfire. These projects were supported by a combination of both state and federal grants with local community and private support. So far there are 124 communities across Nevada and in the Tahoe Basin that have chosen to be ~~F~~ire-Safe" under this program.

The traditional funding stream from federal agencies through the Nevada Fire Safe Council to the local units broke down near the end of 2012. State agencies however are now working together with federal and local groups to restore funding sources for continuation of these effective community-based wildfire mitigation cooperative programs.

In central Nevada, Eureka County and the community of Crescent Valley have worked to minimize wildfire risk earning national recognition by being designated Firewise Communities under a program administered by the National Fire Protection Association.

In September 2007, the University of Nevada, Reno (UNR) Cooperative Extension coordinated the first Nevada Wildland-Urban Interface (WUI) Fire Summit. The purpose of the meeting was to bring state, local and federal agencies together to provide information to

communities rated as extreme risks for wildfire hazard and to promote awareness that would stimulate the communities' desire to mitigate wildfire risk through a grassroots approach. Since 2007, the Nevada WUI Fire Summit has continued to convene fire service personnel, county managers, and other emergency managers annually for those Nevada communities ranked as ~~"e~~extreme", ~~"h~~high" and ~~"m~~moderate" for wildfire hazard to discuss how to lower their hazard ratings and to promote action at the local level. As part of the ~~"L~~Living With Fire" program, this event is made possible with funding from the Bureau of Land Management, the Nevada Fire Safe Council, Sierra Front Wildfire Cooperators, and the Nevada Division of Forestry in cooperation with the USDA Forest Service. Major goals of the annual summit are to decrease the wildfire-hazard rating of Nevada's at-risk communities and create fire-adapted communities capable of surviving wildfire with little or no firefighter assistance, getting community members informed and engaged, recognizing that wildfire survival takes a community, and that we all have a role to play in it.

In recent years, there has been an important shift from protecting communities from wildfire at all costs to preparing them to withstand wildfire. Coincident with this shift is the requisite education of all community stakeholders in wildfire preparedness. There is a role not only for firefighters but also for homeowners, landscapers, construction workers, and politicians as well as for proactive housing developers who can make decisions when designing and building new communities capable of withstanding wildfire by creating defensible space, providing adequate road access for resident evacuation and fire engines, using ignition-resistant building materials, installing water sources for fighting fires, and situating homes so fire racing up steep slopes would be less likely to ignite them.

The U.S. BLM is conducting a statewide wildland fire risk assessment for lands not covered by current CWPPs. There is also a partnership of state and federal agencies including the U.S. Forest Service and the Nevada State Forester to conduct a risk assessment of wildland fire hazard in 17 western states.

Due to Nevada's geography and environment, wildland fires will continue to occur. Increased public awareness, risk management, and control of new land development at the local level are necessary to mitigate this risk.

3.3.21 **Windstorm-Severe** (Low Risk)

3.3.21.1 *Nature*

Winds are horizontal flows of air that move from areas of high pressure to areas of low pressure. Wind strength depends on the difference between the high- and low-pressure systems and the distance between them. Therefore, a steep pressure gradient causing strong winds can result from a large pressure difference or a short distance between a high- and low-pressure system, or a combination of these factors.

Strong and/or severe winds often precede or follow frontal

Figure 3-38. Windstorm damage in Gabbs, Nevada, 1998. *Photo courtesy of NOAA.*

activity, including cold fronts, warm fronts, and drylines. Generally, in the western United States, frontal or downslope winds can become sustained at 30-50 mph for several hours with wind gusts of 60 to 100 mph. Severe winds are defined as those greater than or equal to 58 mph.

In addition to strong and/or severe winds caused by large regional frontal systems, local thermal winds are caused by the differential heating and cooling of the regional topography. In a valley/mountain system, as the rising ground air warms, it continues upslope as wind and is replaced by inflow from outside the valley. The intensity of the resulting wind depends on a number of factors, including the shape of the valley, amount of sunlight, and presence of a prevailing wind. The "Washoe Zephyr" afternoon winds that occur along the Sierra Front of western Nevada during the warm season are some of the most well recognized locally driven wind regimes in Nevada. Local wind patterns driven by the extreme terrain of the state often lead to dangerous fire weather and firefighting conditions.

3.3.21.2 *History*

Wind and windstorms are common events in Nevada, especially during the winter and spring months. An example of high wind is the nighttime down-slope wind that blows out into the Reese River Valley at Austin. At times, when there is a large pressure change over a short distance, these winds become strong causing extensive damage.

Mobile homes, power lines, billboards, airplanes, vehicles, roofs and other structures have been damaged by severe winds. Due to the high incidence of damage to mobile homes, insurance companies in Nevada have adopted policies that require tie-downs. The Nevada Department of Commerce enforces regulations requiring mobile homes to be securely anchored (NRS 289.280).

Unfortunately, until recently extreme wind events were poorly recorded, if at all, and only anecdotally. Table 3-32 below describes some damage-causing extreme wind events recorded in Nevada. The online NOAA database of storm events since 2006 was helpful in compiling this history of wind events. It provides documentation of weather and wind speed as well as wind-event-caused injuries and estimates of damage costs due to wind events since 2006. It also indicates the tremendous strides in recent years in documentation of these events due in part to better instrumentation around the state. The link to the NOAA database is: http://www.ncdc.noaa.gov/stormevents/

Table 3-32. Chronology of Some Severe Destructive Windstorms in Nevada

Date	Location	Description of event/injuries, damages
1873	Moodyville, a small smelter, mill, and tent camp in Dry Valley near Echo Canyon in Lincoln County.	A severe windstorm destroyed the entire camp, population 60, and nothing remains of the site. While it is noted that this was a tent camp, it is the only recorded event where a windstorm erased an entire community.
July 20, 1994	Las Vegas, Clark Co.	The top quarter of the 362-foot-tall sign atop the Las Vegas Hilton was destroyed as winds of 78 m.p.h. were recorded in the Las Vegas Valley. The sign was engineered to withstand winds up to 130 mph.
February 3, 1998	Gabbs and western side of the Paradise Range,	A down-slope windstorm produced sustained winds of 70-80 mph with gusts of 100 mph. Several mobile homes

Table 3-32. Chronology of Some Severe Destructive Windstorms in Nevada		
Date	**Location**	**Description of event/injuries, damages**
	Nye County, 90 miles SE of Reno	were either overturned or blown off their moorings and numerous mature trees were uprooted. There was also widespread structural damage to small buildings around the nearby magnesite mine.
December 14, 2002	Reno-Sparks area, northern Nevada	A record-breaking windstorm with 82 mph winds caused widespread roof, tree, and fence damage. Approximately 140,000 customers in the Reno-Sparks area were without power after the storm.
December 2004	Washoe Valley 15 miles south of Reno, southern Washoe County	A trailer southbound on Old Highway 395 was blown into the pathway of incoming traffic and was shredded. Another truck that had stopped for the collision was overturned by the winds. At least four other big rigs were toppled by gale-force winds in the same area.
September 16, 2006	Hoover Dam bypass project, Clark County	A windstorm toppled the cranes on the Hoover Dam bypass project. The windstorm also knocked down 2,300 foot strands of steel cable. A construction site cleanup was required before the engineers could continue the project. U.S. Highway 93 was closed for two days because of falling debris.
November 14, 2006	Northern NV, Elko County	Strong winds to 83 mph affected much of northern Nevada, particularly Elko County. In Ruby Valley, a home was completely destroyed by wind and a pickup truck moved 20 feet. $100,000 total damage.
December 26-27, 2006	Much of eastern California and western Nevada affected; Washoe, Storey, Mineral, and Lyon counties; Lake Tahoe basin, Washoe Valley.	The strongest windstorm in over four years produced 60-80 mph winds with, gusts over 160 mph along the Sierra crest. Downed power lines sparked brush fires spread by the strong winds; U.S. Highway 395 was closed by the Nevada Highway Patrol due to the many semi rollovers. Reno area had $45,000 in damages. Virginia City-Gold Hill area reported $50,000 in property damages; 70-mph-winds near South Lake Tahoe caused $15,000 in property damage; Regional damages totaled over $125,000.
December 27, 2006	Near Walker Lake, Mineral County	A separate period of strong winds near Walker Lake during the early morning overturned two tractor trailers on Highway 95 with $30,000 in damages.
February 22, 2007	Reno, Carson City, Minden areas to Mineral, Lyon and southern Nye Counties	Winds gusting up to 67 mph; five miles north of Hawthorne, a semi-truck was blown over by the strong winds near Walker Lake with $30,000 in damage done.
April 15, 2007	Lovelock & Imlay area, other parts of western NV; Pershing County	Strong winds knocked trees down in Lovelock and Imlay. Also, a sign at the Lovelock Nugget Motel was damaged by wind gusts, and a carport at the Brookwood Trailer Park was picked up and blown into a neighboring yard causing a total of about $10,000 in damage.
October 4, 2007	Western Clark and Southern Nye Counties	A Pacific storm system brought strong southwest winds to portions of the Mojave Desert and Southern Great Basin. An Emergency Services communications tower was blown down in Pahrump, NV by a measured gust to 61 mph; damages were estimated at $10,000.
January 4, 2008	Baker, White Pine	A strong storm system brought high winds to central and

Table 3-32. Chronology of Some Severe Destructive Windstorms in Nevada		
Date	**Location**	**Description of event/injuries, damages**
	County	northern Nevada with a wind gust in Baker reported at 82 mph and Ely reported wind gusts of 74 mph. The high winds partially blew off a roof from the Baker Elementary School and caused a power outage in the town of Baker. Total damages were estimated at $27,000.
January 5, 2008	Las Vegas Valley	Localized downslope winds off the Spring Mountains gusting to about 65 mph caused damage 10 miles northwest of downtown Las Vegas. Ten homes lost roof tiles. Total damages were estimated at $50,000.
February 13, 2008	Las Vegas Valley; Clark, Esmeralda, and Nye Counties	A strong cold front brought high winds and damage to portions of southern Nevada. The airport was closed where a Port-A-Potty blew across the main runway, damaging runway lighting and a parked vehicle. A mobile home was blown into a neighboring house in Las Vegas Valley, and a large tree crushed a truck. In North Las Vegas 5 street light poles, 8 stop signs, and 3 traffic lights were blown down. Many street vendors who were selling Valentine's Day gifts had much of their inventory blown away. The instrument tower at Yucca Mountain measured a gust of 115 MPH and then was blown down shortly thereafter. Total regional damages were estimated at over $280,000.
April 14th and 15th, 2008	Northern and central Sierra Nevada and western Nevada; Washoe, Storey, Lyon, Churchill counties	A strong cold front with winds that caused some damage in Reno, a portion of a roof was blown off a house, a tree was blown over onto a house, and a carport was blown into a house. Winds damaged signs and construction sites around the Reno-Sparks area. Numerous reports of tree limbs down and uprooted trees. Numerous power poles were down on the west side of Reno and in the North Valleys area 6 miles north of Reno causing power outages. Total damage estimated at about $50,000
September 1, 2008	East Las Vegas, Clark County, NV	Strong winds up to 43 knots damaged carports on two mobile homes, and blew down a fence, with total damage estimated at $15,000.
March 22, 2009	North Las Vegas, Clark County	A cold Pacific storm system brought high winds to the Mojave Desert and southern Great Basin. Gusts at the North Las Vegas Airport (KVGT) were measured at 55 mph. Winds knocked down two power poles in North Las Vegas, one of which fell onto and damaged a vehicle with total damage estimated at $10,000.
April 14, 2009	Esmeralda, central Nye, and western Clark counties, Amargosa Valley	High winds in southern Nevada; severe wind gust in Amargosa Valley caused roof damage to several homes and businesses, and power lines were blown down. Wind knocked down seven power poles 13 miles N of Amargosa Valley. Total damage estimated at $70,000.
May 11, 2009	Boulder City, Clark County, NV	A strong dust devil moved through the Gingerwood Mobile Home Park on the edge of Boulder City, damaging several mobile homes; total damage estimated at
June 2, 2009	East Las Vegas, Clark County, NV	Wind damaged several mobile homes and a car in the Desert Inn Estates Mobile Home Park; Total damages were estimated at $10,000.

Table 3-32. Chronology of Some Severe Destructive Windstorms in Nevada		
Date	**Location**	**Description of event/injuries, damages**
October 4, 2009	Las Vegas Valley, Clark County	Several 8-10 foot trees were blown down, and a large sign was destroyed by high winds in the extreme southwest corner of the Las Vegas Valley. Total damages were estimated at $15,000.
November 20, 2009	Western and west-central Nevada: Washoe County, Carson Valley, Carson City	A fast-moving storm brought strong and damaging winds gusting to 83 mph that damaged trees, fences, and power lines and caused power outages including 2,780 people in Carson City. In addition, there were 4 flight cancellations and about a dozen flight delays at the Reno-Tahoe International Airport. Total damages were estimated at $10,000.
March 29, 2010	Reno-Carson City, Dayton, Minden, Gardnerville areas; Esmeralda and Central Nye Counties	Wind gusting to 72 mph caused power outages and caused difficulty controlling a fire that damaged a furniture store and a hair salon. In Esmeralda and Central Nye Counties, the same windstorm downed trees and power lines, blew a roof off a mobile home, and blew over an irrigation pivot. Visibility was near zero in blowing dust, sand, and gravel. Up to $650,000 total wind-related damages.
April 20, 2010	Goldfield, Esmeralda County, NV	Strong winds blew down power lines in Goldfield, causing power outages; total damage estimated at $50,000.
April 27, 2010	Reno- Lake Tahoe area, Washoe County, NV	Winds up to 63 mph with gusts to 125 mph caused power outages to about 5,000 homes and businesses, ripped shingles off roofs, toppled fences, overturned vehicles, and uprooted hundreds of trees, and canceled over a dozen flights at Reno-Tahoe International Airport. Wind-whipped power lines caused a fire at an apartment complex in Stead just north of Reno. Total damage estimated at $250,000.
April 28, 2010	Las Vegas Valley, Clark County	A powerful storm system brought widespread high winds up to 55 knots that blew down light poles and several trees, knocking out power to at least 300 people. Winds also blew several shingles off roofs, and destroyed a carport at a condominium complex. Total damage estimated at $75,000.
May 10, 2010	Henderson, Green Valley, Las Vegas Valley; Clark County	A Pacific low pressure system brought locally high winds up to 68 mph to southern Nevada and southeast California. Damage reported to the Henderson Pavilion in the Green Valley section of Henderson. Green Valley also reported tree limbs blown down, and a large wooden walking deck blown over. Total damage estimated at $300,000.
May 23, 2010	Mesquite, NV	A dust devil flipped over a Cessna on the tarmac at Mesquite Municipal Airport causing $50,000 in damage.
August 17, 2010	Alunite, NV, Clark County	Thunderstorm winds blew a big rig off U.S. Hwy. 95 near the Eldorado Dry Lake Bed.
August 26, 2010	Henderson, NV, Clark County	Monsoon moisture fueled several rounds of severe thunderstorms over the Mojave Desert and resultant windstorms and flash flooding. A carport on a mobile home sustained $15,000 worth of wind damage.
October 24, 2010	Greater Reno/Carson	Storm brought rain and strong, gusty winds to western

Table 3-32. Chronology of Some Severe Destructive Windstorms in Nevada		
Date	**Location**	**Description of event/injuries, damages**
	City, Minden Area; Washoe, Douglas, Carson City Counties	Nevada with gusts to 102 mph at Galena Creek Bridge, 110 to 130 mph on Slide Mountain , and 79 mph in Washoe Valley, with overturned tractor trailer causing $10,000 in damage.
February 14-15, 2011	Greater Reno/Carson City, Minden Area; Washoe, Douglas, Carson City Counties	A cold front system brought strong winds gusting 66-85 mph to portions of western Nevada. Wind damage reports include: an overturned semi truck near Verdi, four- to 6-inch tree limbs down near Gardnerville, a power line down in southwest Reno which sparked a fire (no damage from fire).
March 7, 2011	Las Vegas Valley, Clark County, NV	Storm with strong west to southwest 45 knots winds ahead of it blew out a transformer in the north part of the Las Vegas Valley. Damages totaled about $5000.
March 20, 2011	Western Clark /southern Nye County, NV	Storm system produced high winds; 63-mph wind gust in Sandy Valley collapsed a structure, injuring four people and killing one horse. Damages were estimated at $75,000.
April 6-7, 2011	Mineral, Lyon, Esmeralda, Southern Nye, Lincoln, Las Vegas Valley, Clark County, NV	Storm system brought high winds to Mojave Desert and southern Great Basin; winds 60 mph with gusts to 90 mph. Wind damage in Las Vegas, North Las Vegas, and Henderson, included several trees down and at least two business signs damaged or destroyed totaling $50,000. Several power lines were blown down in the Fish Lake Valley-Dyer area totaling $15,000 in damages. High winds blew over two tents and caused $5,000 in total property damage at the Clark County Fair and Rodeo in Logandale. Total reported damage for this widespread windstorm event was $70,000.
May 15, 2011	White Pine, Lincoln, Counties	A strong cold front brought strong winds to 63 mph with gusts up to 76 mph to portions of eastern Nevada. A power pole in Ruth was blown down with total damage estimated at $5,000.
July 3, 2011	Henderson, Las Vegas Valley, Clark County, NV	Thunderstorm winds gusting to 62 mph caused damage in a large area of the Las Vegas Valley. The storm blew over several mobile homes, blew down numerous trees (one of which damaged a car), blew down several power poles and lines, causing power outages for at least 10,000 people, and destroyed at least one fireworks stand. Total damage estimated at $1,000,000.
July 9, 2011	Logandale, Clark County, NV	Thunderstorm winds blew down four power poles in Logandale, knocking out power to about 500 homes and causing a total of about $40,000 damage.
July 10, 2011	Las Vegas area, with damage in Valley Siding, Riverside, and Boulder City, Clark County, NV	Winds gusting up to 64 mph. At least two trees were blown down, one onto a house; numerous power poles and lines were blown down; and one child suffered minor injuries when part of a roof blew off an apartment building, into the building next door. Also, a wind gust blew over a semi truck on Interstate 15 near Riverside. In Boulder City area, wind broke apart two docks and damaged 20 vehicles, primarily by lofting gravel which broke windshields. Total wind damage estimated at $315,000.

Table 3-32. Chronology of Some Severe Destructive Windstorms in Nevada		
Date	**Location**	**Description of event/injuries, damages**
November 17th-19th, 2011	Reno-Sparks area, Washoe County, NV	High winds in the SW Reno foothills began late on the 17th, with gusts to 80 mph at the Hwy 50 and 395 Jct. in Carson City. High winds caused the arcing of power lines which started the Caughlin Fire just after midnight on the 18th, resulting in one of the most damaging fires in Reno history on the 19th, causing one fatality, destruction of 26 homes, and 8 million dollars in damage and firefighting costs (Figure 3-39; Table 3-30).
November 30-December 1, 2011	Esmeralda, Western Clark, Lincoln, Southern Nye Counties; Las Vegas Valley	A strong cold front brought high winds to the southern Great Basin and caused damage across several southern Nevada counties. High winds in Amargosa Valley blew down several trees and damaged some older roofs and metal buildings causing a total of $50,000 damage. In the Pahrump area, a boat, RV, and greenhouse were damaged, shingles were blown off roofs, power lines and a radio tower were blown down, and a carport torn down by the wind fell on a woman, injuring her. Total Pahrump damages were estimated at $100,000. In Las Vegas Valley, a wind gust of 67 mph collapsed an aircraft shelter, causing minor injuries to eight personnel. Winds disrupted four electricity distribution lines in Las Vegas, knocking out power to about 5000 customers and causing $10,000 in damages. Large trees were also knocked down near downtown Las Vegas and Summerlin. Total combined damage for this widespread severe windstorm event was about $160,000 with at least nine injuries.
January 19, 2012	Reno-Sparks-Carson Valley area, Washoe County, Carson City, and Douglas County	Winds gusted between 60 and 84 mph south of Reno and were responsible for blowing over a tractor trailer along U.S. Highway 395 near Red Rock Road in the north valleys of Reno, which caused 3 injuries, damage to 13 vehicles, and the shutting down of the highway. Strong winds and the improper disposal of fireplace ashes caused the rapid spread of a wildfire originating at the north end of Washoe Valley early in the afternoon on the 19th. Thousands of people were forced to evacuate from the swift-moving fire. About 3177 acres were burned with 28 homes destroyed, 7 damaged, and one fatality was attributed to the fire. Damage and firefighting costs were estimated at over 4 million dollars.
January 12, 2012	Las Vegas Valley	A strong storm system brought high winds up to 57 knots to the Las Vegas Valley. A skylight window blew out in the Galleria Mall; signs, a power line, and several trees were blown down, and a construction trailer was damaged. Total losses were estimated at $40,000.
Feb 25, 2012	Humboldt, Elko, northern Lander and Eureka Counties	A powerful storm system brought high winds across much of northern Nevada with widespread gusts of up to 76 mph. In Orovada, winds damaged trees, blew gated pipelines apart, broke them, and scattered pieces more than 1/2 mile across fields. A large barn was blown down in Diamond Valley, Humboldt Co. where total damage was estimated at $30,000.
March 6, 2012	Las Vegas Valley, Clark	Cold front brought high winds to southern Great Basin;

Table 3-32. Chronology of Some Severe Destructive Windstorms in Nevada		
Date	**Location**	**Description of event/injuries, damages**
	Co.; Esmeralda County, So. Nye County	many trees were blown down and at least two fell onto houses. In the Las Vegas Valley, at least two roofs, one awning, and one carport were torn off buildings; two light poles were blown down; one fell on a vehicle, large panes of glass were blown out; three solar panels on the roof of City Hall were damaged; one truck and one street sign blew over; several NASCAR race tents were blown down. Damages directly attributable to the wind event in the Las Vegas Valley were estimated at over $500,000. Approximately 14,000 customers lost power after high winds damaged equipment near Jean, resulting in $20,000 of damage. In southern Nye Co., a porch was torn off a home in Beatty by wind and a wind-observation tower 17 miles ESE of Beatty was blown down after registering a 78 mph gust. This damage was reported at $20,000.
March 31, 2012	Much of northern NV with damage in areas of Churchill, Mineral, Lyon, Humboldt, and Pershing Counties, NV	Sustained winds in the 40-65 mph range with gusts to 83 caused blowing dust which reduced visibility to 1/4 mile or less at times in Lovelock and Fallon and blew vehicles off roadways. In addition, a window was reported broken by the wind (not debris) in Lovelock and a single-wide trailer was blown over near Rye Patch Reservoir in Pershing County. Total estimated damage of $10,000 in Pershing Co. area. At Paradise Hills, a ham radio operator lost $3000-$4000 worth of towers, antennas, feed-lines, and house roofing and ventilation. Also in Humboldt County, strong winds blew over a semi-truck traveling westbound on Interstate 80 west of Golconda Summit as well as a pickup truck hauling a 33 foot trailer on U.S. Highway 95 north of Orovada. Total wind damage in Humboldt County was estimated at $10,000. In Mineral and Lyon Counties, winds gusted to 76 mph on Hwy 359 from Anchorite Summit to Yerington and along Hwy 95 near Schurz. NDOT reported a dust storm that closed Hwy 95 from Hawthorne to Luning late in the afternoon. Finally, the Yerington sheriff's office reported power lines and 2 telephone poles down, 3 transformers on fire, and the entire town without power at 1530PST. Total wind damage in Mineral and Lyon Counties due to this wind event was estimated at $30,000.
May 7, 2012	Las Vegas Valley: Sunrise Manor, Paradise, North Las Vegas Clark County, NV	At least four dust devils developed over the Las Vegas Valley in the afternoon, causing significant damage; in Sunrise Manor they tore shingles off the roofs of a bank and multiple units of an apartment complex, damaged several cars, knocked down a cinder block wall and a light pole, and damaged several telephone poles, with total wind damage in Sunrise Manor estimated at $40,000. In Paradise, a dust devil tore numerous tiles from the roof of a business, damaged a large ceramic fountain and a sign, and collapsed an awning causing $10,000 in damage. In North Las Vegas, a dust devil uprooted trees and then struck a retail store, tearing off part of the roof and breaking water lines to the building's sprinkler system.

Table 3-32. Chronology of Some Severe Destructive Windstorms in Nevada		
Date	**Location**	**Description of event/injuries, damages**
		Power was also knocked out to about 2,000 customers. North Las Vegas damage was estimated at $50,000, for a total of about $100,000 in damage due to this series of wind events.
May 25, 2012	Esmeralda County and Amargosa Valley, Nye County	Peak gust of 62 knots occurred 40 miles east of Beatty. In Amargosa Valley, some metal buildings were destroyed, older roofs were damaged, tree limbs were torn down, and power was knocked out causing total estimated damage of $50,000.
June 4, 2012	Fernley, Silver Springs, Stagecoach, Yerington areas in Lyon & Churchill Counties, and Schurz and Hawthorne areas, Mineral County NV	Winds to 55 mph with gusts to 69 mph blew down trees onto roads with a total of 16-20 trees downed around Fernley. Also, some fences were downed and power was out along with visibility reduced to 0.5 mile in Fernley. Total wind damage in Fernley area was estimated at $35,000. In addition, a few trees and power lines were downed in Yerington where visibility was down to 100 yds. In Hawthorne, visibility was down to 0.5 mile at the airport. Fourteen miles south of Walker Lake along US Hwy 95, low visibility was responsible for a 3-car pile-up and closure of the highway between Fallon and Luning. Total wind damage in this area was estimated at $35,000.

Figure 3-39. Caughlin Fire in West Reno on November 18th, 2011. Fire was ignited by high winds arcing power lines. *Photo Credits – Alex Hoon NWS/NOAA*

3.3.21.3 *Location, Severity, and Probability of Future Events*

In the *Hazard Risk Assessment Survey* and *County Hazard Mitigation Plans,* Carson City reported that high winds caused severe damage to mobile home structures. Churchill, Douglas, and Lincoln Counties reported that windstorms were a problem. Eureka County reported that there was significant damage to antennas and communication sites.

Washoe Valley, north of Carson City, reports frequent damaging winds in a major transportation corridor near the center of the valley along U.S. Highway 395/Interstate 580. DEM has records from December, 2006 showing wind damage to Storey County's public and private infrastructure totaling $12,800. DEM also has records reflecting $92,900 in damages to Lyon County's public and private infrastructure.

The State Climatologist prepared data about severe wind events in each county, defined as those in excess of 58 miles per hour, which is presented in Appendix K. Although the data is not directly relevant to state declarations, it will assist each county in its preparedness and response planning. Overall, windstorms are considered low-risk hazards in Nevada. Their consequences are likely to be small in scope compared to floods, earthquakes, and wildfires, however they may be significant contributing factors in the event of wildfires.

Due to the state's geography, severe windstorms occur regularly and are widespread throughout the State of Nevada. This hazard usually occurs in the winter and spring months, although severe winds are known to occur at any time. Additionally, high winds often accompany severe storms and thunderstorms and can lead to dust storms across Nevada roads highways, causing extremely hazardous travel. This is generally looked upon as a continuing problem. It is noted that as land development continues into those areas noted for severe wind events, property damage will continue to happen. This problem may require modification of building codes as well as public education. In order to prevent accidents, injury and property damage due to wind-caused accidents along U.S. 395/I-580 in Washoe Valley, NDOT has had a wind warning system in place since the early 1980s to prohibit high-profile vehicles (such as commercial trucks, RVs, campers, buses and truck-trailers) during severe winds. Automated signage alerts motorists to highway status during severe wind events enabling them to detour onto less wind-prone roads.

3.4 Ranking of Hazards by Counties and Tribes

The Nevada Hazard Mitigation Planning Committee reviewed local, county, and tribal hazard mitigation plans, and their hazard ratings are compiled together as Table 3-33 and 3-34 below. In the last iteration, this data followed each individual hazard profile as a separate table. Here, as a unified table, it is more easily compared for each county and more easily incorporated by the State into its overall vulnerability assessment for each hazard. There are far more counties and tribal entities reporting hazard rankings in this iteration than in the 2010 iteration.

Table 3-33. Rankings of Hazards by County

Local hazards identified by counties	Carson City	Churchill	Clark	Douglas	Elko	Esmeralda	Eureka	Humboldt	Lander	Lincoln	Lyon	Mineral	Nye	Pershing	Storey	Washoe	White Pine
Avalanche	L	N	L	L	L	N				N		L		L	L		
Civil disorder													L				
Drought	M	H	H	N	M	M				H		M	H		M	H	
Earthquake	H	H	H	H	M	M				H		H	M		H	H	
Epidemic	H	M	H	N	M	L				H		L	L		M	L	
Expansive soil	N	N	N	N	N	N				N		N	N		L	N	
Flood (includes flash flood, dam, & canal wall failure, mudslide)	H	H	H	H	M	M				H		M	M		H	H	
Hail and thunderstorm	N	M	H	M	M	L				N		L	L		L	L	
Hazardous materials	M	H	H	N	M	M				H		L	M		L	L	
Heat, extreme	N	N	M	N	N	L				N		N	N		L	N	
Infestation	N	L	L	N	N	N				N		L	L		N	N	
Land subsidence/ground failure	N	N	M	N	N	L				N		L	L		L	N	
Landslide	L	N	L	L	L	N				N		L	L		L	L	
Large venue fires			H														
Mining hazards													M		L		
Nuclear waste/radiological			N							H			M			L	
Terrorism/WMD	H	N	N	N	N	M				M		L	M		M	H	
Tornado	N	M	L	N	N	N				N		N	N		N	L	
Tsunami/Seiche	L	N	N	N	N	N				N		N	N		N	L	
Utility loss/energy emergency	M		N													L	
Volcano	L	L	L	N	N	N				N		M	N		N	L	
Wildfire	H	L	H	H	H	L				H		M	H		H	H	
Windstorm	N	M	L	M	M	L				M		H	M		M	L	
Winter storm/Severe (includes extreme snowfall)	M	M	H	M	M	L				M		M	M		H	M	

Table 3-34. Rankings of Hazards by Tribes

Local hazards identified by tribes	Duck Valley	Duckwater	Ely-Shshone	Fort McDermitt	Fort Mojave	Goshute	Las Vegas Paiute	Lovelock Paiute	Moapa Band	Pyramid Lake	Reno-Sparks	Summit Lake Paiute	Te-Moak-Battle Mountain Band	Te-Moak - Elko Band	Te-Moak – South Fork Band	Te-Moak - Wells Band	Timbisha Shoshone Tribe	Walker River	Washoe Tribe	Winnemucca Colony	Yerington Paiute	Yomba Shoshone
Avalanche	N	N								L	L			N					N			
Civil disorder	N	L								L	L								L			
Drought	N	M								M	M			H					H			
Earthquake	L	L								M	H			H					M			
Epidemic	L	L								H	L			H					L			
Expansive soil	N	N								N	N			N					N			
Flood	H	L								H	H			L					M			
Hail and thunderstorm	N	M								L	L			M					M			
Hazardous materials	L	L								M	L			H					M			
Heat, extreme	L	N								N	N			N					N			
Infestation	N	L								N	N			N					N			
Land subsidence/ground failure	N	L								N	N			N					N			
Landslide	L	N								N	L			L					M			
Large venue fires	N																		N			
Mining hazards	N	L																	N			
Nuclear waste/radiological	N									L	L								N			
Terrorism/WMD	L	L								H	L			M					N			
Tornado	L	N								L	L			M					N			
Tsunami/Seiche	N	N								N	N			N					N			
Utility loss/energy emergency	L									H	M			N					N			
Volcano	N	N								H	L			N					N			
Wildfire	H	H								H	H			H					H			
Windstorm	M	M								M	L			H					L			
Winter storm/Severe	H	M								M	M			H					M			

3.5 VULNERABILITY ASSESSMENT

The next step of risk assessment is the vulnerability assessment. This section includes assessing vulnerability by jurisdiction and assessing vulnerability of State facilities.

3.5.1 Overview

This vulnerability assessment includes only the hazards rated by the Subcommittee as ―High:" Earthquake, Flood (including Dam Failure), and Wildfire. The vulnerability assessment data compiled are derived from local hazard mitigation plans (both approved and in development), UNR's HAZUS runs and assessments as well as other sources listed under the individual hazards below.

DMA 2000 REQUIREMENTS: RISK ASSESSMENT

Assessing Vulnerability by Jurisdiction

Requirement §201.4(c)(2)(ii): The State risk assessment **shall** include an overview and analysis of the State's vulnerability to the hazards described in this paragraph (c) (2), based on estimates provided in local risk assessments as well as the State risk assessment. The State **shall** describe vulnerability in terms of the jurisdictions most threatened by the identified hazards, and most vulnerable to damage and loss associated with hazard events.

Element

Does the **new or updated** plan describe the State's vulnerability based on estimates provided in local risk assessments as well as the State risk assessments?

Does the **new or updated** plan describe the State's vulnerability in terms of the jurisdictions most threatened and most vulnerable to damage and loss associated with hazard event(s)?

Does the updated plan explain the process used to analyze the information from the local risk assessments, as necessary?

Does the updated plan reflect changes in development for jurisdictions in hazard-prone areas?

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

3.5.2 Analysis of State and Local Risk Assessment

The risk analysis was completed exclusively for the natural hazards earthquake, flood, and wildfire rated as ―High" by the Planning Subcommittee.

Earthquake (High Risk)

Earthquake-related information was derived from the United States Geological Survey, the Nevada Seismological Laboratory, and the Nevada Bureau of Mines and Geology.

The Nevada Bureau of Mines and Geology used the most current version available of the Federal Emergency Management Agency's loss-estimation computer model, HAZUS-MH, to estimate such factors as total economic loss, numbers of buildings receiving extensive to complete damage, number of people needing public shelter and hospital care, and number of fatalities from earthquakes of magnitude 5.0, 5.5, 6.0, 6.5, and 7.0. NBMG chose 38

communities that include all the major population centers in each of Nevada's 17 counties. The epicenters of the earthquakes were chosen at the fault position that is closest to each community. A depth of 10 kilometers (6 miles) was used for each scenario. Magnitudes ranging from 5.0 to 7.0 were chosen to illustrate the variation that magnitude has on losses.

The data were compiled into tables summarizing losses for each community and the state, including 400 separate HAZUS summary reports. The individual HAZUS summary reports include the following data for each community and the state.

- General description of the region
- Building and lifeline inventory
- Building inventory
- Critical facility inventory
- Transportation and utility lifeline inventory
- Earthquake scenario parameters
- Direct earthquake damage
- Buildings damage
- Critical facilities damage
- Transportation and utility lifeline damage
- Induced earthquake damage
- Fire following earthquake
- Debris generation

The complete report is available as Nevada Bureau of Mines and Geology Open-File Report 13-1, Updated Estimated Losses from Earthquakes near Nevada Communities, in Appendix M and online at: http://www.nbmg.unr.edu/dox/of098/Scenarios/OpenFileReport13-1.pdf

Summary HAZUS earthquake loss values for selected Nevada communities are contained in Tables 3-42 and 3-43 found in Section 3.7.1 below.

In 2011, NBMG completed a study entitled ~~-C~~omparison of Loss-Estimation Modeling Using HAZUS with Ground-Motion Input from ShakeMap versus Default Values" (NBMG OFR 11-1) that corroborated the validity of HAZUS values within an order of magnitude except at the lowest earthquake magnitudes studied. Results are available online at: http://www.nbmg.unr.edu/dox/of11-1.pdf

The study concludes that loss estimates from HAZUS using ShakeMap ground motions are higher than those calculated by HAZUS, probably due mainly to the use of different fragility functions. However, the two calculations still yield results that are mostly well within an order of magnitude of one another. ShakeMap provides more accurate information about ground shaking than that derived from HAZUS, because in a real earthquake, ShakeMap incorporates actual measurements of ground motion. Unfortunately, there are still too few strong motion stations, even in and near urban areas in Nevada, to create ShakeMaps.

Flood (High Risk)

To assess risks and vulnerability due to flooding, the Nevada Bureau of Mines and Geology used the most current version available of FEMA's loss-estimation model, HAZUS-MH for reaches of the Carson, Colorado, Humboldt, Muddy, Truckee, Virgin, and Walker Rivers. In all cases, the HAZUS runs used floods with average 100-year return periods.

The HAZUS modeling program integrates many factors contributing to the frequency and severity of flooding that include:

- Rainfall intensity and duration
- Antecedent moisture conditions
- Watershed conditions, including steepness of terrain, soil types, amount and type of vegetation, and density of development
- Changes in landscape resulting from wild fires (loss of moisture-trapping vegetation and increased sediment available for runoff)
- The existence of attenuating features in the watershed, including natural features such as swamps and lakes, and human-built features such as dams
- The existence of flood control features, such as levees and flood control channels
- Velocity of flow
- Availability of sediment for transport, and the erodibility of the bed and banks of the watercourse

These factors were evaluated using:

- (1) Hydrologic analysis to determine the probability that a discharge of a certain size will occur, and
- (2) Hydraulic analysis to determine the characteristics and depth of the flood that results from that discharge.

The complete report with all data generated by these HAZUS runs is contained in Nevada Bureau of Mines and Geology Open-File Report 13-3 entitled —Updated Assessment of Risks and Vulnerability to Flood Hazards in Nevada"

This report is referenced in Section 7 and is available as an online document at the following link:

http://www.nbmg.unr.edu/dox/of103/_docs/of 13-3.pdf

Tables 3-44 and 3-45 found in Section 3.7.2 below summarize the HAZUS flood assessment and losses.

The NHMPC recognizes the need to assess non-riverine flood risks in Nevada and has expanded studies in two areas where flooding occurs in populated communities statewide: failure of irrigation canals & ditches and flash flooding on developed alluvial fans. With funding received for this iteration of the state plan, an initial study of the failure of irrigation canals and ditches along the Truckee River in the Reno area has revealed a more complex ownership situation than anticipated with occasional use of the canals as storm water diversions. Committee members are currently working on

other funded hazard mitigation activities and also will be promoting local activities that implement strategies to mitigate these hazards.

Wildfire (High Risk)

To assess wildfire vulnerability, the Subcommittee used approved local hazard mitigation plans, the most current version of the Community Wildfire Protection Plans (CWPPs) and assessed valuations of real property for each county. NDF provided the West Wide Wildfire Risk Assessment, last updated in August, 2012, accessible online at: http://www.westwideriskassessment.com/about/aboutwwa.html . Under this assessment, GIS wildfire hazard mitigation maps were produced for thirteen counties that show the assessed valuation of property and land value affected by wildfire risk. Appendix J contains jpg files of these maps and the map data will be made available to planning groups via MyPlan, on request from the SHMO, and at local technical assistance meetings. Parcel value data was not available for the four remaining counties (Esmeralda, Lander, Nye, and White Pine); when it is available, similar maps will be produced for those counties.

Representatives from NBMG and NDF have discussed a joint project for the compilation of the data for building inventory, critical facilities, infrastructure and their respective replacement values in a GIS-based database. This project is ongoing since the last iteration of the Plan. A comprehensive, user-friendly wildfire website is being planned pending identification of likely funding sources.

Since the last plan update, NDF collaborated with the Western States Foresters and Western Forestry Leadership Coalition (including federal agencies such as the Bureau of Land Management and the U.S. Forest Service) to update a statewide risk assessment for areas of the state that had not been previously assessed.

3.5.3 State's Vulnerability Based on Local, County, and Tribal Assessments as well as State Assessments

The updated plan includes a description of vulnerability to each of the high-rated hazards based on estimates provided in local risk assessments as well as the State risk assessments (see each Hazard description section above). The State will continue to work with the local, county, and tribal entities to convey the most up-to-date information from risk or vulnerability assessments, such as the HAZUS results presented in Subsections 3.6 for earthquakes, 3.7 for floods, and NDF analysis presented in Subsection 3.8 for wildfire. Results of all vulnerability assessment studies will be shared with local communities throughout the state, and communities and counties will share their results and data with the state as they become available through the MyPlan website, providing a two-way exchange that benefits all in hazard mitigation strategy development.

3.5.4 State's Vulnerability in Terms of Jurisdictions Most Threatened and Vulnerable.

Local jurisdictions' vulnerabilities to the three highest-ranked hazards are found in the sections listed below:

- Earthquake — Section 3.7.1, Tables 3-42 and 3-43,
- Flood — Section 3.7.2, Tables 3-44 and 3-45
- Wildfire — Section 3.7.3, Tables 3-46 and 3-47

Table 3-35. Threat Rankings by County

Threat - Top Five Counties for Each Major Hazard

	EQ Risk	EQ Cost (millions)	EQ Threat	FL Risk	Flood Cost (millions)	FL Threat	WF Risk	Wildfire Cost (millions)	WF Threat
Carson City	5	$3,016	3	5	$1,374	2	5	$1,318.9	2
Churchill	5	$217		5	$119		1	$0.0	
Clark	5	$100,118	1	5	$3,178	1	5	$95.4	
Douglas	5	$3		5	$32		1	$2,893.4	1
Elko	4	$776	5	3	$776	3	5	$551.8	
Esmeralda	3	$7		3	$7		1	$6.5	
Eureka*	5	ND		5	ND		5	ND	
Humboldt*	5	$46		3	$9		5	$335.4	
Lander*	3	$44		3	$33		5	$15.9	
Lincoln Co	5	$128		5	$35		5	$43.2	
Lyon*	3	$1,052	4	5	$133		5	$690.1	4
Mineral	5	$104		3	$216	5	3	$0.3	
Nye Co	5	$8		3	$0.04		3	$0.0	
Pershing*	3	$17		3	$6		5	$26.0	
Storey	5	$118		5	$14		5	$577.2	5
Washoe	5	$5,160	2	5	$720	4	5	$900.0	3
White Pine*	3	ND		3	ND		5	ND	

*** = Plan in Progress ND=No Data**

Source: State-approved local hazard mitigation plans and plans under development through July 2013.

Table 3-35 above, Threat Ranking by County, was developed using a combination of approved local hazard mitigation plans and plans under development. All counties either have approved plans or are in the plan development process. It shows projected losses in millions of dollars from each of the major hazards, Earthquake, Flood, and Wildfire, for all

counties. The –Threat" column for each hazard shows the top 5 counties ranked by economic loss for each of the major hazards, earthquake, flood and wildfire along with the stated vulnerability rating for each of those three hazards. This ranking is considered during the NHMPC grant application prioritization process.

3.5.5 Results of Changes in Development

Table 3-36 shows the cumulative change in population in Nevada counties from 2010 to 2012. The greatest total increase by population is found in Clark and Washoe counties; however, Elko and Humboldt counties have the greatest growth by percentage (due mainly to a surge in gold mining over this period). An overall slowdown in rapid growth across the state (except for mining communities) presents a challenge as many communities suffer from smaller budgets and therefore smaller staffs to enforce existing codes and regulations. As demonstrated in Table 8-4, Section 8.6.4, more Nevada communities have adopted the latest versions of international building and fire codes, however, enforcement of codes and regulations becomes cumbersome with reductions in staffing.

Table 3-36. Population Change in Nevada by County 2010-2012

	Population Estimates		Change, 2010 to 2012	
	April 1, 2010 Estimates Base	July 1, 2012	Difference	Percent
Nevada Total	2,700,552	2,758,931	58,379	2.2
Counties				
Churchill	24,877	24,375	-502	-2.0
Clark	1,951,269	2,000,759	49,490	2.5
Douglas	46,997	46,996	-1	0.0
Elko	48,818	51,216	2,398	4.9
Esmeralda	783	775	-8	-1.0
Eureka	1,987	2,001	14	0.7
Humboldt	16,529	17,048	519	3.1
Lander	5,775	5,941	166	2.9
Lincoln	5,345	5,405	60	1.1
Lyon	51,980	51,327	-653	-1.3
Mineral	4,772	4,653	-119	-2.5
Nye	43,946	42,963	-983	-2.2
Pershing	6,753	6,749	-4	-0.1
Storey	4,010	3,935	-75	-1.9
Washoe	421,407	429,908	8,501	2.0
White Pine	10,030	10,042	12	0.1
Carson City	55,274	54,838	-436	-0.8

Source: U.S. Census Bureau website
http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk

Increases in population place more people at risk from the high-risk hazards of earthquake, wildfire, and flood including dam failure. These risks are particularly dangerous to communities when:

- Building along faults and locations prone to extreme shaking during an earthquake.
- Developing residential locations within areas prone to wildfire without the required

defensible space, water storage, or building materials.

- Developing residential neighborhoods on alluvial fans that are vulnerable to flash-flooding in arid environments.
- Potential flood and dam failure concerns are ignored as dams are built along the creeks, rivers and waterways.

Other challenges to land use planning are the following:

- Enforcement – lack of staffing in rural counties due to the county's economic, administrative and technical capabilities.
- State laws are not effective unless counties and cities adopt and enforce them at the local level.
- Federal ownership of land - over 85% of the land in Nevada is federal property. New development on privately owned property is often flanked on several sides by federally owned land making the mitigation of hazards problematic, especially for wildfire and flood hazards.

Possible solutions to avoid risks posed by hazards are:

1. Provide incentives to communities for added enforcement of existing codes.
2. Create stricter requirements for development.
3. Enhance land-use-planning capabilities.
4. Initiate water reclamation projects.
5. Restrict water-saving features to new homes;
6. Provide incentives for new and existing homeowners to mitigate the risk to their homes from possible hazards.
7. Increase hazard mapping and study programs for all hazards but especially on alluvial fans and areas adjacent to canals and ditches.
8. Increase public awareness for all hazards.

3.6 Assessing Vulnerability of State Facilities

The requirements for assessing vulnerability of State facilities, as stipulated in the DMA 2000 and the regulations implementing the act are described below.

DMA 2000 REQUIREMENTS: ASSESSING VULNERABILITY

Assessing Vulnerability of State Facilities

Requirement §201.4(c)(2)(ii): State-owned critical or operated facilities located in the identified hazard areas shall also be addressed … .

Element

Does the **new or updated** plan describe the types of State-owned or -operated critical facilities located in the identified hazard areas?

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

3.6.1 Types of State-Owned or -Operated Critical Facilities in Hazard Areas

Definition of a Critical Facility

Critical facilities in the state are defined as those that will impact the delivery of vital services to Nevadans; or whose damage would put special populations at risk; or which could cause greater damage to other sectors of the community.

The State recognizes that some privately owned critical facilities are essential to Nevada's economy and livelihood such as casinos. A major disaster would have a strong negative impact on these private assets as well as on state facilities.

At the completion of this update in 2013, there were a total of 2,928 facilities on the listing of buildings owned by the state. Table 3-37 below summarizes the state's critical facilities and infrastructure, and their replacement value updated for 2013. These data were gathered from the following State agencies: Public Works Division (SPWD), Department of Transportation, and the Enterprise Information Technology Services Division.

Table 3-37. State Critical Facilities and Infrastructure

Category	Number	Replacement Value ($ Millions)
Government (legislative, judicial, executive)	5	171
DMV	17	100.3
Public Safety (prisons, EOC, highway patrol, fire)	31	1639.49
University/colleges	7	627.7
National Guard	3	183.21
Hospitals/ Clinics	8	336.87
Communication	110	71.93
Bridges	3	980.79
Water Well	15	0.65
Total	199	4112.25

3.6.2 Estimating Potential Losses by Jurisdiction

The requirements for estimating potential losses by jurisdiction, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: ESTIMATING POTENTIAL LOSSES

Estimating Potential Losses by Jurisdiction

Requirement §201.4(c)(2)(iii): The State risk assessment **shall** include an overview and analysis of potential losses to the identified vulnerable structures, based on estimates provided in local risk assessments as well as the State risk assessment.

Requirement §201.4(d): **Plan must be reviewed and revised to reflect changes in development.**

Element

Does the **new or updated** plan present an overview and analysis of the potential losses to the identified vulnerable structures?

Are the potential losses based on estimates provided in local risk assessments as well as the State risk assessment?

Does the updated plan reflect the effects of changes in development on loss estimates?

Source: FEMA, Standard State Hazard Mitigation Plan review Crosswalk 2008

As part of the current update to this plan, the most recent version of HAZUS was run for a series of earthquake and flood scenarios. An earthquake that has happened in the geological past was chosen on a fault near each county seat. Results and vulnerability analyses for earthquake are discussed and tabulated in Section 3.7.1 below.

For floods, HAZUS was run for 100-year floods on the major rivers within the state (Carson, Colorado, Humboldt, Muddy, Truckee, Virgin, and Walker). Results and vulnerability analyses for flood are discussed and tabulated in Section 3.7.2 below. For potential failures of major dams on the Truckee (and its tributaries in California), Carson, and Humboldt Rivers, the 100-year flood values serve as a proxy for potential losses. HAZUS scenarios for failures of the two dams on the Colorado River in Nevada (Hoover and Davis) have not been analyzed; Hoover Dam is discussed in Section 3.3.8.3.

For wildfire vulnerability, NDF provided an analysis of potential wildfire losses in areas of mapped as moderate to high-risk for wildfire compared to the assessed value of improved and unimproved land provided by the county assessors‘ offices. These data are displayed in Table 3-46 and 3-47 in the wildfire vulnerability subsection 3. 7.3.

3.6.3 Estimating Potential Losses of State Facilities

The requirements for estimating potential losses of State facilities, as stipulated in the DMA 2000 and its implementing regulations, are described below. The Division of Water Resources estimates that the dam failure losses will be similar to flood losses. Therefore, we do not present separate data for dam failure but include it as a type of flooding. Potential losses to State building facilities were estimated for the three highest-ranking natural hazards: earthquake, wildfire, and flood. These loss estimations are presented in the following subsections.

DMA 2000 REQUIREMENTS: ESTIMATING POTENTIAL LOSSES

Estimating Potential Losses of State Facilities

Requirement §201.4(c)(2)(iii): The State **shall** estimate the potential dollar losses to State-owned or operated buildings, infrastructure, and critical facilities located in the identified hazard areas.

Requirement §201.4(d): **Plan must be reviewed and revised to reflect changes in development . . .**

Element

Does the **new or updated** plan present an estimate of the potential dollar losses to State owned or operated buildings, infrastructure, and critical facilities in the identified hazard areas?

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

3.6.3.1 Earthquake Loss Estimation for State Facilities

The earthquake vulnerability analysis for state buildings was updated for this iteration in the following manner: SPWD and NBMG coordinated the geocoding of additional State facilities and infrastructure to include in the HAZUS runs and developed GIS layers enhancing this analysis. However this led to the discovery of additional rural buildings without a physical address that will need to be geocoded in the future.

Losses were calculated using the updated *"Nevada State Owned Building List"* received from the State Public Works Division (SPWD), which provided a 2013 updated average replacement value of $275 for all state buildings that was used (as compared to the replacement value of $210.29 per square foot used in the 2010 iteration of the plan).

1. The sum of the square footage for all State Buildings equals 22,566,365 sq. ft.
2. The sum of the square footage for Critical State Buildings equals approximately 21,304,320 sq. ft.
3. The replacement value for all State Buildings totals $6,205,750,375.
4. The replacement value for Critical State Buildings is approximately $5,858,688,000.

UNR's NBMG ran a probabilistic HAZUS run for Nevada annualized over a 100-yr period. A HAZUS run using the out-of-the box default data, which does not include many State or local government structures, produced an annualized loss rate of 0.00044213 or 0.044213 percent. This came to $54,867,897.55 per year when calculated against the total dollar value of the existing building stock for Nevada as identified in HAZUS.

Using this loss rate and the replacement values for all State Buildings and Critical State Facilities listed above, the annualized loss is expected to be approximately $2,743,748 for all State Buildings and $2,590,301 for Critical State Buildings.

Simply using the replacement values listed above and the ratio of the Capital Stock Loss ($2,511,210,000) to the Statewide total building replacement cost ($144,878,000,000) in a single likely earthquake in the Reno-Carson City area (magnitude 7.1 on the Carson Range frontal fault system) from a recent HAZUS run by NBMG, the estimated losses to all State buildings would be approximately $108 million and the estimated losses to all Critical State Buildings would be approximately $102 million.

Similarly, using the replacement values listed above and the ratio of the Capital Stock Loss ($6,866,020,000) to the Statewide Total Building Replacement Cost ($144,878,000,000)in a single likely earthquake in the Las Vegas area,(magnitude 6.9 on the Frenchman Mountain Fault) from a recent HAZUS run by NBMG, the estimated losses to all State Buildings would be approximately $294 million, and the estimated losses to Critical State Buildings would be approximately $278 million.

3.6.3.2 Loss Estimation for Flood for State Facilities

The State Division of Risk Management provided a listing of state facilities found in Special Flood Hazard Areas along with the insured value for the buildings.

The State Flood Insurance Program Manager, based on historical data, concluded that there would be a building loss of approximately 30% for buildings located within the 100-year flood zone. The losses calculated include contents of each facility as provided by the Division of Risk Management. Using this loss percentage, the estimated losses for State-owned critical and non-critical facilities during a 100-year flood are summarized in Table 3-38 below.

Table 3-38. Flood Vulnerability of State-Owned Buildings

Hazard Rating		Building Inventory Affected				Total Losses in ($) Millions
		Critical		Non-Critical		
		Number	Value in ($ Mill)	Number	Value in ($ Mill)	
Statewide	Extreme					624.6
	High	237	188.5	699	436.1	
	Medium					

Source: NV Risk Management

3.6.3.3 Loss Estimation for Wildland/Urban Interface Fires for State Facilities

For buildings in the listing provided by the State Public Works Division (SPWD) without a replacement value, the members of the Planning Subcommittee agreed to use the previous cost of $200 sq ft for replacement cost of a structure. For all facilities, the state Fire Program Manager confirmed the loss of the entire structure when faced with wildland fire whether in extreme, high or medium risk location, the value of contents was calculated by adding 50 percent to its total cost. This is considered an average cost to include cleaning of smoke damage, loss of function, equipment, and supplies. The formula is:

$$\text{Loss} = (\text{Area} \times \$200) + ((\text{Area} \times \$200) \times .50)$$

for facilities with no current replacement value. Otherwise, the value provided by the SPWD was used with a 50 percent value for contents added. The Nevada Division of Forestry (NDF) used GIS data to overlay the density of fuels around state facilities with current location to determine the risk of the structures to wildland fire. No facilities were found to be at extreme or high wildland fire risk. The loss estimation due to wildfire for state facilities is

shown in Table 3-39. The maps created for this vulnerability assessment are found in Appendix J.

Table 3-39. Wildfire (WUI) Vulnerability of State-Owned Buildings

Hazard Rating		Building Inventory Affected				Total Losses in ($) Millions
		Critical		Non Critical		
		Number	Value in ($ Million)	Number	Value in ($ Million)	
Statewide	Extreme					
	High					
	Medium	30	932.6	12	65.4	998.0

Source: NDF & SPWD

3.6.3.4 Vulnerability of State Communication Facilities due to Earthquake, Flood, and Wildfire

In Nevada, communication facilities are managed by the Department of Transportation and the Department of Information Technology (DoIT). Because the management lies outside of the State Public Works Division and was received at a later time, this information was not included in the HAZUS or wildfire vulnerability assessments. Table 3-40 below shows the vulnerability for state-owned communications facilities based on the information provided by DoIT Director of Communications. The location of these facilities will be integrated into the HAZUS data base and the wildfire GIS module for inclusion in the overall analysis next iteration of this plan. The analysis consists of applying the number of facilities at risk of each hazard by the replacement value, estimated at $500,000 each, with an increase of 50 percent of the value for contents. For example, all 110 facilities are at risk of earthquake, presuming complete damage, 110 X $500,000 = $5,500,000. With a 50 percent increase for contents: $5,500,000+2,750,000 =$8.250 million. DoIT estimates that 20 percent and 60 percent of the communication facilities are at risk of flood and wildland fire respectively.

Table 3-40. Vulnerability for State-owned Communication Facilities

Hazard Rating		Communications Facilities Inventory Affected						Total Losses in ($) Millions
		Earthquake		Flood		Wildfire		
		Number	$ Mill	Number	$ Mill	Number	$ Mill	
Statewide	Extreme	110	82.5					
	High					66	49.5	
	Medium			22	16.5			148.5

Source: NV Department of Information Technology

3.7 Vulnerability Assessment and Analysis of Potential Losses

3.7.1 *Earthquake*

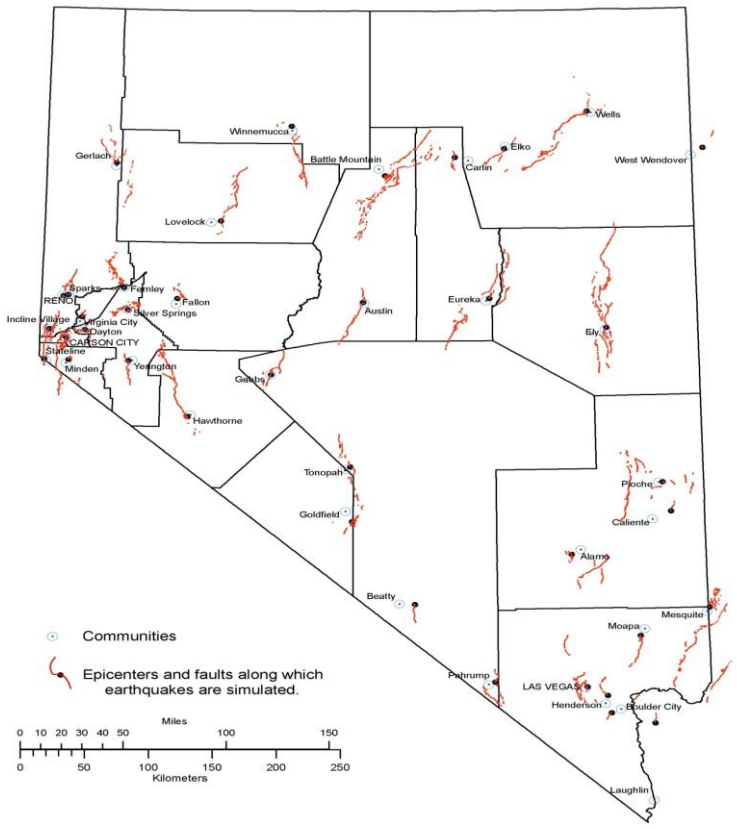
The following information is taken from Nevada Bureau of Mines and Geology Open-File Report 09-08, *Estimated Losses from Earthquakes near Nevada Communities,* 2009, by Jonathan G. Price, Gary Johnson, Christine M. Ballard, Heather Armeno, Irene Seelye, Linda D. Goar, Craig M. dePolo, and Jordan T. Hastings, which is available in Appendix M and online at this link:

http://www.nbmg.unr.edu/dox/of098/Scenarios/OpenFileReport09-8.pdf

Figure 3-40 below shows the location of the thirty-eight Nevada communities chosen for the scenarios for this report. It estimates losses from earthquakes that could occur near the communities, which include all county seats and major population centers. The online report includes links to detailed loss estimation scenarios for each community for each of the given earthquake values. The report uses the Federal Emergency Management Agency's loss-estimation computer model, HAZUS-MH, to estimate such factors as:

- total economic loss
- numbers of buildings receiving extensive to complete damage
- number of people needing public shelter and hospital care
- number of fatalities

from earthquakes of magnitude 5.0, 5.5, 6.0, 6.5, and 7.0.



Note: The faults chosen for the earthquake scenarios are also shown. The epicenters of the earthquakes were chosen at the fault position that is closest to the community.

Figure 3-40. Locations of the 38 Communities in Nevada for which HAZUS Earthquake Scenarios Have Been Developed

3-41. Probabilities of Earthquakes of Various Magnitudes Occurring within 50 years within 50 kilometers (31 miles) of 38 Major Communities in Nevada

County	County seat *or other community*	% Probability of occurrence of magnitude greater than or equal to:					Rank by Probability
		5.0	5.5	6.0	6.5	7.0	
Carson City	Carson City	>90	~80	70	50-55	12-15	2
Churchill	Fallon	80-90	~60	35	20-25	6-8	14
Clark	Las Vegas	40-50	~30	12	4-5	<0.5	28
	Boulder City	50-60	~30	12	4-5	<0.5	23
	Henderson	50-60	~30	12	4-5	<0.5	23
	Laughlin	10-20	~5	2-3	0.5-1	<0.5	38
	Mesquite	20-30	~15	4-6	2	<0.5	35
	Moapa	40-50	~25	10	4-5	<0.5	30
Douglas	Minden	>90	~80	67	50-60	10-12	6
	Stateline	>90	~80	60-70	40-50	10	9
Elko	Elko	30-40	~25	10-15	6-8	0.5-1	31
	Carlin	40-50	~30	10-15	6-8	0.5-1	27
	Wells	30-40	~20	9	6	0.5-1	32
	West Wendover	20	~10	4	1-2	<0.5	37
Esmeralda	Goldfield	80-90	~55	20-30	5-10	<1	15
Eureka	Eureka	40-50	~30	10-15	4-6	<0.5	28
Humboldt	Winnemucca	50-60	~35	15-20	5-10	1-1.5	22
Lander	Battle Mountain	60-70	~40	18	10	1.5	20
	Austin	60-70	~40	20	10-15	2-3	19
Lincoln	Pioche	30-40	~20	6-10	2-3	<0.5	33
	Alamo	70-80	~50	20-25	6-8	<0.5	17
	Caliente	50-60	~35	10-15	4	<0.5	23
Lyon	Yerington	>90	~75	60	40-45	12	8
	Dayton	>90	~80	70-75	50-55	15-18	1
	Fernley	90	~70	48	35	8	12
	Silver Springs	>90	~70	50-60	30-40	10-12	11
Mineral	Hawthorne	>90	~75	61	30-40	10-12	10
Nye	Tonopah	70-80	~50	20-30	5-10	<1	17
	Beatty	70-80	~55	30-40	20-30	10-12	16
	Gabbs	90	~65	40-50	20-25	6-8	13
	Pahrump	30-40	~25	5-10	3	<1	33
Pershing	Lovelock	50-60	~35	10-20	10	1-2	21
Storey	Virginia City	>90	~80	70	50	12-15	3
Washoe	Reno	>90	~80	67	50	12-15	4
	Gerlach	40	~25	10-15	6-10	2-3	26
	Incline Village	>90	~80	60-70	40-50	10-12	7
	Sparks	>90	~80	67	50	12-15	4
White Pine	Ely	20-30	~15	4-6	1.5-2	<0.5	35

Source: Data taken from maps produced by the U.S. Geological Survey and accessible at this link: http://egint.cr.usgs.gov/eqprob/2002/index.php

The probability of occurrence of each of these earthquake magnitudes for the listed communities is also tabulated using the U.S. Geological Survey's probabilistic seismic hazard analysis and is shown in Table 3-41 above.

What these Magnitudes Mean

Although it is nearly impossible to specifically predict what an earthquake of a given size might do to a community, the earthquake sizes presented relate to different general levels of damage. Generally, the greater the magnitude, the stronger the shaking will be and the longer the shaking will last.

Magnitude 5 earthquakes are distinctly felt by almost everybody and can cause rockslides and nonstructural damage, such as heavy, unsecured objects falling off shelves.

Magnitude 6 earthquakes can cause significant nonstructural damage, especially in basins and along ridge tops.

Magnitude 6.5 earthquakes can create surface offsets, may be of longer duration, and can cause significant damage.

Magnitude 7 earthquakes cause widespread structural and nonstructural damage, and require a significant "recovery period" for communities to get back to the way they were before the quake.

It is noteworthy that the earthquake that struck Wells Nevada on 21 February 2008 was a magnitude 6.0 event. The probability of such an earthquake striking the Las Vegas urban area is higher than the probability for Wells, and the probability of such an earthquake striking the Reno-Sparks-Carson City urban corridor is considerably higher than for Wells.

A shaking potential map for the entire state of Nevada is shown in Figure 3-41.

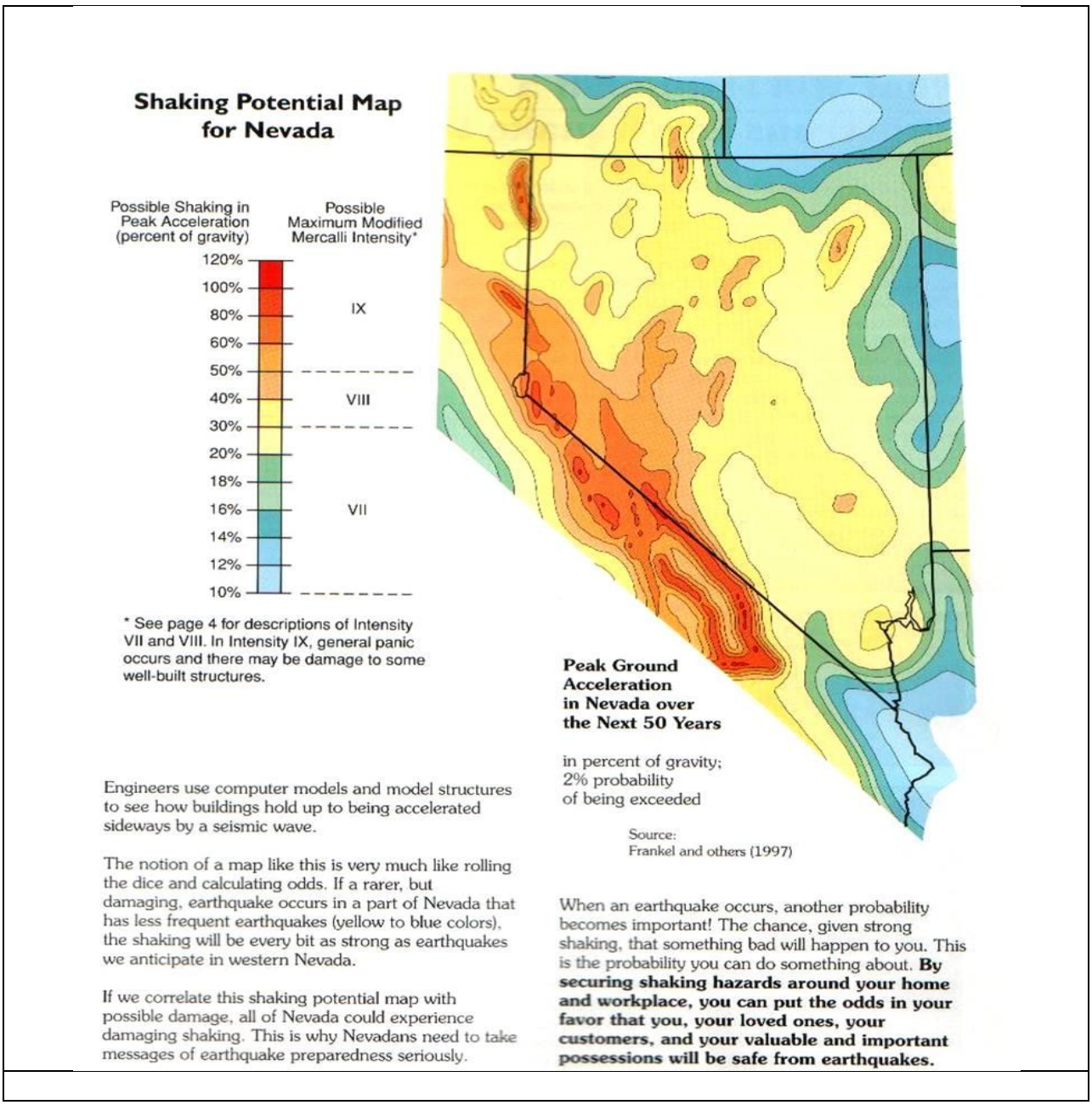


Figure 3-41. Shaking Potential Map for Nevada
Source: Nevada Bureau of Mines and Geology Special Publication 27

HAZUS damage estimates for individual communities for each scenario magnitude earthquake are presented in Table 3-42 below or may be accessed online at this link:

http://www.nbmg.unr.edu/dox/of098/Scenarios/OpenFileReport09-8.pdf

Table 3-42. HAZUS Summary Estimates for Total Economic Losses				
County	**County seat (bolded)** *or other community (italicized)*	**Total Economic Loss**	**% Probability of occurrence** *(from Table 3-41)*	**Rank by Loss**
Carson City	**Carson City**	$650,000,000	70	6
Churchill	**Fallon**	$110,000,000	35	13
Clark	**Las Vegas**	$7,200,000,000	12	1
	Boulder City	$1,400,000,000	12	5
	Henderson	$2,500,000,000	12	2
	Laughlin	$79,000,000	2-3	16
	Mesquite	$59,000,000	4-6	19
	Moapa	$94,000,000	10	14
Douglas	**Minden**	$340,000,000	67	10
	Stateline	$590,000,000	60-70	7
Elko	**Elko**	$160,000,000	10-15	12
	Carlin	$9,800,000	10-15	35
	Wells	$30,000,000	9	25
	West Wendover	$19,000,000	4	29
Esmeralda	**Goldfield**	$13,000,000	20-30	33
Eureka	**Eureka**	$34,000,000	10-15	24
Humboldt	**Winnemucca**	$46,000,000	15-20	21
Lander	**Battle Mountain**	$18,000,000	18	31
	Austin	$26,000,000	20	26
Lincoln	**Pioche**	$20,000,000	6-10	28
	Alamo	$5,100,000	20-25	37
	Caliente	$12,000,000	10-15	34
Lyon	**Yerington**	$56,000,000	60	20
	Dayton	$340,000,000	70-75	11
	Fernley	$62,000,000	48	17
	Silver Springs	$60,000,000	50-60	18
Mineral	**Hawthorne**	$24,000,000	61	27
Nye	**Tonopah**	$18,000,000	20-30	30
	Beatty	$6,500,000	30-40	36
	Gabbs	$2,600,000	40-50	38
	Pahrump	$84,000,000	5-10	15
Pershing	**Lovelock**	$17,000,000	10-20	32
Storey	**Virginia City**	$490,000,000	70	9
Washoe	**Reno**	$1,900,000,000	67	3
	Gerlach	$39,000,000	10-15	23
	Incline Village	$510,000,000	60-70	8
	Sparks	$1,800,000,000	67	4
White Pine	**Ely**	$44,000,000	4-6	22

Note: Figures are derived from a magnitude 6.0 earthquake on a fault close to each of the scenario communities and probability of a magnitude 6 or greater earthquake occurring within 50 years within 50 kilometers (31 miles) of each community. Source: NBMG OFR 09-08; 2009, Estimated Losses from Earthquakes near Nevada Communities, by Jonathan G. Price, Gary Johnson, Christine M. Ballard, Heather Armeno, Irene Seelye, Linda D. Goar, Craig M. dePolo, and Jordan T. Hastings

NOTE: A more recent version of HAZUS was used to do new runs for all 38 communities in 2013, but the projected loss values were so low as to be unreasonable estimates of potential losses. After much discussion among professionals on the Subcommittee, the decision was made to use the 2009 HAZUS figures as more reasonable estimates of potential losses until errors in the HAZUS program can be rectified to give more accurate figures.

Table 3-42 indicates that damage from major earthquakes could range from hundreds of thousands of dollars in sparsely populated rural counties to billions of dollars in urban areas. Tens of thousands of buildings could suffer extensive or complete damage. Fatalities could reach into the hundreds. Thousands of people may need public shelter. Importantly, many earthquakes are likely to cause significant, simultaneous damage in multiple counties. In particular, a major earthquake anywhere in the Reno-Carson City urban corridor is likely to cause significant damage in not only Carson City but also in adjacent Douglas, Storey, and southern Washoe Counties.

Table 3-43 ranks the top ten Nevada communities by potential economic losses due to the scenario earthquake. Not surprisingly, the counties with the largest populations are generally the ones with the most at risk.

Table 3-43. HAZUS Top Ten Nevada Communities for Highest Potential Economic Loss from Earthquake

County	County seat (bolded) *or other community*	Total economic loss	% Probability *(see Table 3-41)*	Rank by Loss
Clark	**Las Vegas**	$7,200,000,000	12	1
Clark	*Henderson*	$2,500,000,000	12	2
Washoe	**Reno**	$1,900,000,000	67	3
Washoe	*Sparks*	$1,800,000,000	67	4
Clark	*Boulder City*	$1,400,000,000	12	5
Carson City	**Carson City**	$650,000,000	70	6
Douglas	*Stateline*	$590,000,000	60-70	7
Washoe	*Incline Village*	$510,000,000	60-70	8
Storey	**Virginia City**	$490,000,000	70	9
Douglas	**Minden**	$340,000,000	67	10

Source: HAZUS, NBMG, UNR

HAZUS program runs also demonstrate that essential facilities will be severely stressed following major earthquakes. The HAZUS program predicts that hospitals in the epicenter areas will have insufficient beds to accommodate the number of injured people, which means that plans should be improved for transporting injured people to hospitals in other unaffected jurisdictions. Fire stations, police stations, and schools will most likely be operating at reduced capacity due to earthquake damage, and there may be significant damage to utilities and transportation systems.

HAZUS is a modeling tool only. Given the uncertainties in actual ground-shaking and potential damage during earthquakes, HAZUS damage estimates are likely to differ from actual losses by a factor of between two and ten. Nonetheless, HAZUS provides a reasonable, widely accepted methodology for estimating vulnerabilities and ranking areas by relative risk.

From a geological perspective, it is obvious that all areas of Nevada will experience major earthquakes at some time in the future. Thus, all communities are justified in preparing for a serious earthquake scenario regardless of the probability of occurrence of an earthquake of that magnitude, particularly in the consideration of using earthquake-resistant building standards in the design and planning of critical facilities.

3.7.2 *Flood*

Flooding is considered to be a "High Risk" hazard in much of Nevada. Floods can potentially affect many areas developed for businesses and homes, and they can affect multiple jurisdictions, as was the case in January of 1997, when Carson City, Douglas, Lyon, Storey, and Washoe Counties were impacted by floods on the Carson, Walker, and Truckee Rivers. Based on the frequency of flooding in the past, the probability of future, damaging floods in Nevada is high.

Emerging tools and techniques will help in the process of identifying the structures with the highest flooding vulnerability. GIS data of Nevada's Critical Facility structures have been compiled and can be used with the new digital flood hazard data to query detailed information. Current and future flood hazard mapping as part of FEMA's RiskMAP program will include a data set called "Areas of Mitigation Interest." Features of this data set include: stream flow pinch points, locations of past claims, key emergency routes overtopped during frequent flooding events, areas of significant erosion or mitigation success. With a general idea of potential mitigation projects, the task of ranking the proposed project can be facilitated with the use of a refined HAZUS analysis (updated terrain data, hydrologic and hydraulic analyses, and updated building stock/population data).

To assess risks and vulnerability associated with riverine flooding, the Nevada Bureau of Mines and Geology has run the most recent version of FEMA's loss-estimation model, HAZUS-MH for reaches of the Carson, Colorado, Humboldt, Muddy, Truckee, Virgin, and Walker Rivers. The results using HAZUS-MR4 are summarized in Tables 3-44 and 3-45. In most cases, the HAZUS runs used floods with average 100-year return periods.

Although failures of dams can cause floods, no specific HAZUS runs were made to simulate dam failures. Nonetheless, the inundation caused by a flood with a 100-year return period can be used to approximate the damage that could occur from some dam failures, particularly along the Truckee River (with the Stampede, Boca, and Prosser Reservoirs along tributaries in California, upstream from Reno), Carson River (with Lahontan Reservoir upstream from Fallon), and Humboldt River (with Rye Patch Reservoir upstream from Lovelock).

Tables 3-44 and 3-45 indicate that damage from floods could range from hundreds of thousands of dollars in sparsely populated rural areas to hundreds of millions of dollars in large urban areas. Hundreds of buildings could suffer complete destruction.

Thousands of people may need public shelter. Hundreds of thousands of tons of debris may need to be cleared.

One way of assessing vulnerability is in terms of total building-related economic losses, summed for the counties affected by a 100-year flood. Using this measure, flood vulnerabilities are ranked as follows:

Highest loss: Truckee River: $1.316 billion
2nd highest: Carson River: $475 million
3rd highest: Colorado River: $180 million
4th highest: Humboldt River: $101 million
5th highest: Muddy River: $79 million
6th highest: Walker River: $9 million
7th highest Virgin River: $8 million

Clearly, Nevada's northern counties, Washoe County in particular, are more at risk than its southern ones for floods along major rivers. Clark County is, however, very vulnerable to damage from flash flooding on alluvial fans along ephemeral streams, particularly in Las Vegas Valley. This vulnerability is difficult to quantify without further extensive geologic mapping in areas where residential, industrial, and commercial development is extending over alluvial fan surfaces.

Table 3-44. Summary of HAZUS Loss-Estimation Output for 100-year Floods on Major Rivers in Nevada

River	County	Cities	Building-Related Economic Loss ($ million)	Number of People Needing Public Shelter	Debris Generated (tons)
Carson					
	Douglas	Gardnerville, Minden	44	1,060	1,995
	Carson City	Carson City	13	747	465
	Lyon	Dayton, Silver Springs	30	390	1,333
	Churchill	Fallon	388	7,346	42,390
Carson	**Total**		**475**	**9,543**	**46,183**
Colorado					
	Clark	Laughlin, Bullhead City, Riviera	180	352	49,631
Colorado	**Total**		**180**	**352**	**49,631**
Humboldt					
	Elko	Elko, Carlin	45	1,160	8,046
	Eureka	Palisade, Beowawe	0.21	0	35
	Lander	Battle Mountain	1.1	1	38
	Humboldt	Winnemucca	54.9	259	3,431
	Pershing	Lovelock (protected by Rye Patch	0.1	0	18

Table 3-44. Summary of HAZUS Loss-Estimation Output for 100-year Floods on Major Rivers in Nevada					
River	**County**	**Cities**	**Building-Related Economic Loss ($ million)**	**Number of People Needing Public Shelter**	**Debris Generated (tons)**
		Reservoir)			
	Churchill	no large town	n/a *	n/a *	n/a *
Humboldt	**Total**		**101**	**1,420**	**11,568**
Muddy					
	Lincoln	Ursine, Panaca, Caliente	0.23	0	62
	Clark	Moapa, Glendale, Logandale, Overton	79	2,711	13,734
Muddy	**Total**		**79**	**2,711**	**13,796**
Truckee					
	Washoe	Verdi, Reno, Sparks, Wadsworth, Nixon	1,316	12,908	65,425
	Lyon		0	0	0
	Storey	Lockwood	28	520	6,867
Truckee	**Total**		**1,344**	**13,428**	**72,292**

Table 3-45 shows the vulnerability of buildings in each county to HAZUS MR4 100-year floods on selected rivers in Nevada, ranked both by economic loss and by loss as a percentage of exposure.

Table 3-45. Vulnerability to HAZUS 100-year Floods on Selected Rivers in Nevada						
River & County	**Building Exposure ($ million)**	**Building-Related Economic Loss ($ million)**		**Loss as % of exposure (%)**	**Rank by Economic Loss**	**Rank by Loss as % Exposure**
		2010	2013			
Carson River					2	1
Douglas County	3,888	54	44	1.1%		
Carson City	4,024	39	13	0%		
Lyon County	2,049	39	30	1%		
Churchill County	1,433	551	388	27%		
Total	**11,394**	**683**	**475**	**30.0%**		
Colorado River					3	6
Clark County only	96,719	N/A	180	0.19%		
Humboldt River					4	3

Table 3-45. Vulnerability to HAZUS 100-year Floods on Selected Rivers in Nevada						
River & County	**Building Exposure ($ million)**	**Building-Related Economic Loss ($ million)**		**Loss as % of exposure (%)**	**Rank by Economic Loss**	**Rank by Loss as % Exposure**
Elko County	2,600	76	45	2%		
Eureka County	128	0.5	0.209	0%		
Lander County	609	4.4	1.066	0%		
Humboldt County	1,021	67.9	54.854	5%		
Pershing County	311	18.2	0.09	0%		
Churchill County	1,433	n/a	0	0%		
Total	**6,102**	**167**	**101**	**7%**		
Muddy River					5	5
Lincoln County	268	0.5	0	0.1%		
Clark County	96,987	70	79	0.08%		
Total	**97,255**	**71**	**79**	**0.2%**		
Truckee River					1	2
Washoe County	29,166	1,042	1,316	4.5%		
Lyon County	2,049	0	0	0.0%		
Storey County	237	26	28	11.8%		
Total	**31,452**	**1,068**	**1,344**	**16.3%**		
Virgin River					7	7
Clark County only	96,719	12	8	0.01%		
Total	**96,719**	**12**	**8**	**0.01%**		
Walker River					6	4
Lyon County	2,048	181	8	0%		
Douglas County	3,888	0.24	0.08	0.00%		
Mineral County	386	3	0.87	0.23%		
Total	**6,322**	**184**	**9**	**0.6%**		

Table 3-45 summarizes vulnerability (or risk) from floods using two methods of ranking flood vulnerability:

(1) by building-related economic loss and
(2) by economic loss as a percentage of building exposure.

The county's building exposure, one of the factors within the HAZUS program, is a measure of the economic wealth of the county and a proxy for the ability of the county to recover from a disaster. Ranked by loss as a percentage of exposure, the most vulnerable rivers are:

Highest vulnerability: Carson River
2nd highest: Truckee River
3rd highest: Humboldt River
4th highest: Walker River

5th highest: Muddy River
6th highest: Colorado River
7th highest: Virgin River

The complete HAZUS flood report with all data generated by these HAZUS runs will be contained in Nevada Bureau of Mines and Geology Open-File Report 13-3 entitled —Updated Assessment of Risks and Vulnerability to Flood Hazards in Nevada." This report is available as an online document at

http://www.nbmg.unr.edu/dox/of103/docs/OF13-3.pdf

Many of the HAZUS-generated figures for building-related economic loss have changed drastically since the 2010 iteration as illustrated in the third and fourth columns of Table 3-45 Reasons for these variations have not yet been identified but are related to changes in the HAZUS software used to arrive at these numbers.

Appendix H contains maps showing the extent of flooding for the 100-year flood event along each of the following river systems: the Carson, Colorado, East Humboldt, West Humboldt, Walker, Virgin, and Muddy as well as a location map showing the location of these rivers within the state of Nevada. Colored contour areas represent the peak floodwater depth, an indicator of flooding intensity, scaled from 0 to 177 feet, depending on the river and the area flooded.

The HAZUS runs have been done along major rivers within the State. However, as population in Nevada grows and development continues to expand outward from the currently populated areas, additional buildings will likely become prone to flooding in and along what are normally dry alluvial fans, washes, or ephemeral streams, particularly around the periphery of Las Vegas Valley. Flooding in these areas is typically caused by intense rainfall over relatively short periods of time. The Clark County Regional Flood Control District has an aggressive program to reduce these hazards within their jurisdiction in an attempt to mitigate flood hazards along dry washes, in canyons, and on alluvial fans.

3.7.3 *Wildfire*

For wildfire vulnerability, NDF provided a GIS analysis of maximum potential wildfire losses in areas mapped as medium to extreme risk for wildfire overlain by the assessed values of improved and unimproved property obtained from the county assessors' offices to generate a total potential maximum exposure of property loss for each county. These data are displayed in Table 3-46 below. Wildfire Risk Maps and a summary of county assessors' property value lists from which the GIS data analysis was generated are located in Appendix J. For a few counties, no assessor's data were available to complete the analysis at this time (Esmeralda, Lander, Nye, and White Pine).

Table 3-46. Wildfire Vulnerability in Moderate to High-Risk Areas

County	Total Potential Losses, improved and unimproved land (assessed values)
Carson City	**$466,393,297**

Churchill County	**$56,861,154**
Clark County	**$8,258,339,834**
Douglas	**$1,657,517,378**
Elko County	**$565,024,216**
Esmeralda County	**ND**
Eureka County	**$23,379,953**
Humboldt County	**$134,079,813**
Lander County	**ND**
Lincoln County	**$860,845,367**
Mineral County	**$21,316,009**
Nye County	**ND**
Pershing County	**$65,373,680**
Storey County	**$8,918,814**
Washoe County	**$231,356,625**
White Pine	**ND**
State Total	**$12,349,406,140**

Source data compiled from parcel value listings from county assessors' offices and from NDF wildfire risk maps. Both are in Appendix J.

Table 3-47 below presents an assessment of wildfire vulnerability and potential losses of due to wildfire on tribal lands and two Nevada counties not covered in Table 3-46 above. Data source was the 2010 NHMP Table 3-49, which derived the data from the local hazard mitigation plans. To assist the communities still lacking any wildfire vulnerability assessment for the current iteration of this plan (White Pine and Lander), the state will request funding to work with Nevada Division of Forestry and the local county assessors to gather building stock value and number data resulting in a GIS-based vulnerability analysis that will be available to those communities via the MyPlan website.

Table 3-47. Wildfire Vulnerability Assessment of Nevada Counties and Tribal Lands not included in Table 3-46

County/Tribal Hazard Mitigation Plan	Hazard Rating	Population affected	Building Inventory Affected				No. of Critical Facilities affected		Total by Rating	Total Losses $ x1000
			Residential		Non-Residential					
			Number	($x1000)	Number	($ x1000)	Number	($x1000)		
Esmeralda County	Extreme								0	
	High								0	
	Moderate	971	629	32,554	10	1,391	35	6,500	40,445	40,445
Nye County	Extreme	103	75	71	5,840	2	5,400		73	
	High	63	75	6,169	0	0	0	0	6,169	
	Moderate								0	6,242
Duck Valley Indian Reservation	Extreme								0	
	High	1,268	449	39,695	8	1,287	131		40,982	
	Moderate								0	40,982
Elko Band	Extreme								0	
	High								0	
	Moderate	729	267	30,884	15	44,797	6	4,565	80,246	80,246
Reno-Sparks Indian Colony	Extreme									*
	High									
	Moderate	919			2	183				
Pyramid Lake Paiute Tribe	Extreme									*
	High	Not available	6	128	2	324				
	Moderate	Not available	6	128	2	324				
Washoe Tribe	Extreme								0	35,339
	High	3,833			Not available	15,007	57	20,332	35,339	
	Moderate								0	
Esmeralda County	*All people, critical facilities and structures are equally vulnerable to this hazard*									
Nye County	*No critical facilities were found vulnerable to wildland fire in the LHMP; (data from 2010 NHMP, Table 3-49)*									

*included in Washoe County figures

This Section describes the State's mitigation goals that guide the selection of mitigation activities. It also describes how the previous goals were assessed and whether or not they were revised. It includes a discussion of the State's pre- and post-disaster hazard management policies, programs, and capabilities. It includes an evaluation of State laws, regulations, policies, and programs related to hazard mitigation. It evaluates the State's policies related to development in hazard-prone areas and discusses State funding capabilities for hazard mitigation projects. This section includes a general description and analysis of the effectiveness of local mitigation policies, programs, and capabilities.

The Subcommittee's strategy is to support and encourage the lead agencies and their efforts to achieve their mitigation goals and objectives to the maximum extent possible. This Plan stresses its support of all mitigation efforts as resources become available.

For the 2013 iteration of this plan, the NHMP Subcommittee made the following revisions:

- *Table 4-1showing the State's mitigation goals and lead agencies was changed by the deletion of the column showing changes to the goals because the goals remained valid.*
- *Table 4-2 showing the State's mitigation goals and strategic actions was updated with current data from groups such as the Nevada Earthquake Safety Council and the Nevada Division of Forestry.*
- *Table 4-3 of hazard management policies, programs, and capabilities was updated with additional hazardous materials programs and current data.*
- *Tables 4-4, 4-5, 4-6 and Figures 4-1, 4-2, 4-3 relating to hazard mitigation grant funding were revised to reflect additional program management capability and funding received since the last plan iteration.*
- *Table 4-7 of State Model Codes was updated to reflect changes in revised statutes since the last plan iteration.*
- *Table 4-8 Local Capabilities General Analysis was updated to reflect changes in local and plan status and changes to capabilities since the last plan iteration, and approved tribal plans were added.*
- *New STAPLE-E prioritization of Strategic Actions was done by the Subcommittee and used to update Table 4-10, Strategic Action Plan Matrix.*
- *Tables 4-11 and 4-12 of potential and current funding sources were revised slightly to reflect additional funding sources developed since the last plan iteration.*
- *Definitions for Repetitive Loss and Severe Repetitive Loss properties were revised based on new legislative data from the Biggert-Waters Act Flood Insurance Reform Act of 2012.*

The requirements for mitigation strategy are described below:

DMA 2000 REQUIREMENTS: MITIGATION STRATEGY OVERVIEW

Mitigation Strategy

Requirement §201.4(c)(3)(i): To be effective the plan **must** include a Mitigation Strategy that provides the State's blueprint for reducing losses identified in the risk assessment.

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

4.1 HAZARD MITIGATION GOALS

The requirements for hazard mitigation goals, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: MITIGATION STRATEGY

Hazard Mitigation Goals

Requirement §201.4(c)(3)(i): The State mitigation strategy **shall** include a description of State goals to guide the selection of activities to mitigate and reduce potential losses.

Requirement §201.4(d): Plan must be reviewed and revised to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities . . .

Element

Does the **new or updated** plan provide a description of State mitigation **goals** that guide the selection of mitigation activities?

Does the updated plan demonstrate that the goals were assessed and either remain valid or have been revised?

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

4.1.1 Hazard Mitigation Goal Assessment Overview

The NHMP Subcommittee members were asked to review and assess the 2010 goals for the 2013 Enhanced Plan based on the revised hazard rankings that resulted from the Subcommittee's hazard categorization and assessment work presented earlier in Section 3 that identified earthquake, flood, and wildfire as the High Risk hazards in the state. Specific feedback was requested from those Subcommittee members from the lead agencies for each of the major profiled high-risk hazards – earthquake, flood, and wildfire. The five previous 2010 goals were found to still be valid for 2013 without modifications. These goals and the lead agencies that assessed them are shown in Table 4-1. The lead agency for each goal is the state agency with regulatory responsibility to address a particular proposed action, or which is capable and willing to organize resources, find appropriate funding, oversee implementation, monitor and evaluate the goal's activities. Agencies that may be able to assist in the implementation of a particular proposed action item by providing added resources to the lead agency are also listed. The intent of these goals is to guide NHMPC in the selection of mitigation activities at the state level as well as the local jurisdiction level in accomplishing these goals.

Table 4-1. 2013 Goals and Lead Agencies	
2013 Goals	**2013 Lead Agencies**
Goal 1: *Reduce the loss of life and injuries.*	*Nevada Division of Emergency Management (NDEM) and Nevada Hazard Mitigation Planning Committee (NHMPC)*
Goal 2: *Improve local hazard mitigation plans -technical assistance.*	*Nevada Division of Emergency Management and Nevada Hazard Mitigation Planning Committee*
Goal 3: *Reduce the possibility of damage and losses due to earthquakes.*	*Nevada Bureau of Mines and Geology (NBMG), Nevada Seismology Laboratory (NSL), Nevada Earthquake Safety Council (NESC), NDEM, NHMPC*
Goal 4: *Reduce the possibility of damage and losses due to flooding.*	*Nevada Division of Water Resources(NDWR), NHMPC*
Goal 5: *Reduce the possibility of damage and losses due to wildfire.*	*Nevada Division of Forestry (NDF)*

4.1.2 Mitigation Goals and Strategic Actions

The NHMP Subcommittee members and specifically the lead agencies for each of the 2013 profiled High-Risk hazards were asked to review and assess all 2010 strategic actions for the 2013 Enhanced Plan. Updates are shown in Table 4-2 with any changes, additions, or deletions noted in an added column at the end. The intent of the updated Strategic Actions is to guide NHMPC in the selection of mitigation activities at the state level as well as the local jurisdiction level to accomplish the goals. Since these goals and actions were developed through the contribution of state and local agencies, they are a guide to the mitigation activities that are needed in Nevada. Each action provides a framework for the NHMPC members to advise, review, and direct resources of the state to projects that will address hazard mitigation. The flood action items were developed by the Nevada Division of Water Resources staff including the State Floodplain Manager and the Dam Safety Officer. The Nevada Division of Forestry provided the Wildland Fire actions. NBMG working with NESC and NSL developed the Earthquake actions. The Subcommittee and DEM staff joined forces to update the current actions found in Goal 1 to reduce the loss of life and injuries and improve local hazard mitigation plan technical assistance.

Table 4-2. Mitigation Goals and Strategic Actions			
Goal/Lead Agency	**#**	**Strategic Action**	**Changes and reason for (a) modification, or (b) deletion**
Goal 1: ***Reduce the loss of life and injuries*** ***Nevada Division of Emergency Management and Nevada Hazard Mitigation Planning Committee***	1.A	Improve awareness of the locations, potential impacts and links among hazards, vulnerability and measures to protect life safety and health.	
	1.B	Provide current information and workshops about hazards, vulnerabilities, mitigation processes and technical assistance for planning and grant availability and application procedures to State and local agencies.	
	1.C	Encourage the incorporation of mitigation measures into repairs, major alterations, new development and redevelopment practices.	
	1.D	Promote the modification of structures to meet life safety standards.	
	1.E	Improve communication, collaboration and integration among stakeholders and promote hazard mitigation as an integrated public policy.	
	1.F	Encourage local governments, special districts and tribal organizations to develop, adopt, implement maintain and update hazard mitigation plans.	The words “maintain and update” were added because a majority of local plans are developed or in progress and will require only maintenance and updating from now on
	1.G	Develop a hazard communication system that can be used to rapidly detect and provide early warning for multiple hazards, including earthquakes and wildfires.	

Table 4-2. Mitigation Goals and Strategic Actions			
Goal/Lead Agency	**#**	**Strategic Action**	**Changes and reason for (a) modification, or (b) deletion**
Goal 2: ***Improve Local Hazard Mitigation Plans Technical Assistance*** ***Nevada Division of Emergency Management and Nevada Hazard Mitigation Planning Committee***	2.A	~~Promote local hazard evaluation and mitigation planning and assist in developing local hazard mitigation plans~~ Provide technical assistance, guidance, resources and tools to local governments and tribal entities to promote hazard evaluation and to develop and update hazard mitigation plans.	Combined 2a and 2b The majority of local plans are developed or area in progress and will require only updating from now on; while most tribes still require plan development.
	~~2.B~~	~~Provide technical assistance, guidance, resources and tools to local governments for all aspects of local hazard mitigation planning~~	Combined 2a and 2b The majority of local plans are developed or in progress and will require only updating from now on; while most tribes still require plan development.
	2.B	Provide specialized training and exercises to state agency staff and local governments concerning local hazard mitigation planning and the local hazard mitigation plan program.	
	2.C	~~Develop~~ Maintain a tracking system for local and state government mitigation plans and projects.	Deleted word "Develop" and added "Maintain" because plan is already developed; and requires only maintenance
	2.D	Provide training to local governments and state agency staff to clarify mitigation measures from response and recovery and preparedness measures.	
	2.E	~~Develop~~ Maintain a system to allow state agencies with hazard mitigation programs and plans to make recommendations about how local governments can incorporate these in support of the state's mitigation program efforts.	Deleted word "Develop" and added "Maintain" because NHMPC is this system that has been

Table 4-2. Mitigation Goals and Strategic Actions			
Goal/Lead Agency	**#**	**Strategic Action**	**Changes and reason for (a) modification, or (b) deletion**
			implemented and requires only maintenance
	2.F	Continue to build operational links between hazard mitigation, disaster preparedness and recovery programs with public and private sectors	
	2.G	Promote understanding by the general public of the benefits of hazard mitigation in reducing casualty and property losses and ensuring continuity of businesses, institutional and government functions	
	2.H	Promote coordination among state agencies, local governments and tribal organizations of regional hazard mitigation activities	
	2.I	Identify, enhance and integrate public education efforts by state and local agencies that have programs directed to hazard mitigation	
Goal 3: ***Reduce the possibility of damage and losses due to earthquakes*** ***NBMG, NV Seismology Laboratory (NSL), Nevada Earthquake Safety Council (NESC),***	3.A	Protect existing assets, as well as future development, from the effects of earthquakes by providing setback criteria for building and development.	Goal 3 was modified to better integrate the strategic actions of the NESC 2013 Strategic Plan. Strategic Action 3A was modified to match strategies of NESC.
	~~3.B~~	~~Mitigate shaking hazards in communities' and State critical facilities so that they are seismically resistant and operational following a strong earthquake.~~	Deleted. Integrated into 3F and G
	3.B	Hold workshops on strategies, benefits, risk-reduction opportunities, and challenges associated with the inventory of seismically susceptible buildings.	
	3.C	Assist communities and State to retrofit, change occupancy to decrease risk, or demolish susceptible buildings and structures.	

Table 4-2. Mitigation Goals and Strategic Actions			
Goal/Lead Agency	**#**	**Strategic Action**	**Changes and reason for (a) modification, or (b) deletion**
	3.D	Create planning for "special consideration zones" for Nevada communities.	
	3.E	Create microzonation of earthquake hazards in Nevada.	
	~~3.G~~	~~Improve the threshold of detection and accuracy of location for earthquakes throughout Nevada~~	Deleted. Covered by #3S and 3Y
	3.F	Encourage seismic retrofit of deficient essential structures and infrastructure of community and State critical facilities (economic and lifeline-utilities) to structurally and seismically withstand the effects of earthquakes.	modified to match strategies of NESC
	3.G	Encourage seismic retrofit of public safety and critical facilities (both community and State) (such as 911 communications, hospitals, fire, law enforcement and ambulance facilities, etc.)	Added to match strategies of NESC
	3.H	Develop lesson plans or activities for teachers to increase awareness about Nevada's earthquake hazard that tie into the existing science curriculum and align with the science standards for the state.	Added to match strategies of NESC.
	3.I	Increase media involvement by networking with partners from all media types such as print, radio, TV, and social media.	Added to match strategies of NESC.
	3.J	Provide Applied Technology Council (ATC) training and develop formalization of the process.	Added to match strategies of NESC.
	3.K	Expand earthquake awareness in educational sites such as regional science fairs, and speakers.	Added to match strategies of NESC.
	3.L	Develop earthquake hazard information programs targeting public safety, emergency managers, local government executives, and business and industry.	Added to match strategies of NESC.
	3.M	Promote the Great Nevada Shakeout and earthquake drills throughout the state.	Added to match strategies of NESC.
	3.N	Promote training of volunteer community emergency response teams (CERT) about earthquake risks and possible mitigation activities.	Added to match strategies of NESC.
	3.O	Promote training of hospital staff about earthquake risks and possible mitigation activities.	Added to match strategies of NESC.

Table 4-2. Mitigation Goals and Strategic Actions			
Goal/Lead Agency	**#**	**Strategic Action**	**Changes and reason for (a) modification, or (b) deletion**
	3.P	Improve integration of the emergency management system at all levels of the community bringing forth the "whole community" approach.	Added to match strategies of NESC.
	3.Q	Provide publications and workshops to promote the exchange of technical information relating to earthquakes among professionals, managers and the citizens of Nevada.	Added to match strategies of NESC.
	3.R	Promote a post-earthquake technical clearinghouse through planning and established practices.	Added to match strategies of NESC.
	3.S	Give planning and special consideration to developing a "Fault Map of Nevada" and identifying all active faults and seismic sources near major urban areas in Nevada.	Added to match strategies of NESC.
	3.T	Establish a "lifelines and transportation" workgroup.	Added to match strategies of NESC.
	3.U	Enhance implementation of nonstructural remediation.	Added to match strategies of NESC.
	3.V	Create earthquake planning scenarios (Las Vegas and rural areas).	Added to match strategies of NESC.
	3.W	Determine potential fault rupture characteristics and maximum earthquakes.	Added to match strategies of NESC.
	3.X	Continue to inventory and field-verify unreinforced masonry buildings in Nevada and make this data publicly available to planners and emergency response staff in communities statewide.	Added to match strategies of NESC.
	3.Y	Promote coordination among private and public entities to improve statewide earthquake monitoring capabilities.	Added to match strategies of NESC.
	3.Z	Identify potential funding sources for earthquake mitigation strategic actions not only at the Federal and State levels but also from private funding and community partnerships.	Added to match strategies of NESC.
	3AA	Develop a set of model codes and regulations that would be presented after a major earthquake occurs in Nevada.	Added to match strategies of NESC.
Goal 4:	4.A	Protect existing assets, as well as future development, from the effects of flooding.	

Table 4-2. Mitigation Goals and Strategic Actions			
Goal/Lead Agency	**#**	**Strategic Action**	**Changes and reason for (a) modification, or (b) deletion**
Reduce the possibility of damage and losses due to flooding ***Div. of Water Resources, NHMPC***	4.B	Identify and prioritize areas in the State where existing flood hazard mapping is inadequate due to planned and existing significant development and conduct flood hazard mapping in those areas.	
	4.C	Conduct flood hazard mapping in piedmont and alluvial fan environments.	
	4.D	Retrofit State buildings to meet NFIP standards.	
	4.E	Assist communities and State with programs to elevate, dry-flood proof or wet-flood proof identified structures to obtain NFIP compliance and/or mitigate repetitive loss structures and severe repetitive loss structures.	Added SRL structures
	4.F	Assist communities and State with programs dealing with repetitive loss structures and severe repetitive loss structures; these programs may involve acquisition and demolition; relocation; elevation or other mitigation strategies.	Added SRL structures and broadened possible mitigation strategies to deal with them.
	4.G	Upgrade State-owned or operated infrastructure (e.g. servicing roads, culverts, bridges, channels, and structures) related to State-owned or operated critical facilities to protect critical facilities from flood damages or disruption of essential services.	
	4.H	Protect existing assets as well as future development from the effects of dam failure	
	4.I	Inventory existing dams and add to the inventory as dams are discovered or constructed.	
	4.J	Inventory and inspect existing dams for structural and hydraulic adequacy and implement operational constraints, if warranted.	
	4.K	Install early warning weather stations in watersheds with dams above populated areas.	
	4.L	Assist communities and State in structural mitigation measures, updates, repairs and maintenance to dams, ditches, and canals.	Added the words “maintenance, ditches, and canals” to incorporate mitigation activities for canals and ditches.

Table 4-2. Mitigation Goals and Strategic Actions			
Goal/Lead Agency	**#**	**Strategic Action**	**Changes and reason for (a) modification, or (b) deletion**
	4.M	Encourage local ordinances and regulations to reduce encroachment into flood-prone zones resulting from dam impoundment or high (non-failure) releases.	
	4.N	Identify hazards of flooding from man-made structures, such as irrigation ditches and canals, and integrate these into local zoning ordinances.	
	4.O	Develop laws and regulations that ensure reasonable standards of design and construction to reduce flood hazards.	
	4.P	Develop Emergency Action Plans to ensure swift coordinated response in the event of an emergency.	
Goal 5: ***Reduce the possibility of damage and losses due to wildfire.*** ***Division of Forestry***	5.A	Protect existing assets, as well as future development, from the effects of wildfire.	
	5.B	Identify and recommend changes to State NRS, NAC and communities' ordinances and regulations.	
	5.C	Assist local communities in enacting local ordinances for mitigation and fire prevention.	
	5.D	Provide public education and outreach to educate homeowners in the Wildland Urban Interface (WUI) about proper defensible space practices and landscaping for fire resistance and encourage community involvement in project completion, participation, and maintenance.	
	5.E	In highly motivated communities, focus on activities by individual participation in and maintenance of projects (personal responsibility).	
	5.F	Educate and train State and communities in current standards and regulations for proper practices in defensible space and firefighting.	
	5.G	Ensure proper personal protective equipment, apparatus, equipment and training for career staff and seasonal wildland firefighters.	
	5.H	Assist volunteer fire departments in attaining funds for proper personal protective equipment, apparatus, equipment and training.	
	5.I	Participate in research and development of interoperability for emergency response communications.	
	5.J	Coordinate the development of a comprehensive, collaborative program for mutual aid/mobilization of	

Table 4-2. Mitigation Goals and Strategic Actions			
Goal/Lead Agency	**#**	**Strategic Action**	**Changes and reason for (a) modification, or (b) deletion**
		state and local government fire resources.	
	5.K	Encourage collaboration on all levels among state, federal and local cooperators, both fire- and resource-related.	
	5.L	Continue to improve fire prevention programs statewide through partnerships with Fire Prevention Association of Nevada, State Fire Marshal's Office, University of Nevada Cooperative Extension, and any other cooperators.	
	5.M	Assist communities in fuels-reduction projects for areas with extreme or high ratings in updating Community Wildfire Protection Plan (CWPP) assessments.	
	5.N	Provide funding and service forestry technical assistance through the State Fire Assistance and Hazardous Fuels Reduction programs to reduce fuels on state and private property.	
	5.O	Provide assistance to counties for priority setting and CWPP updating.	
	5.P	Provide a statewide evaluation process for monitoring community progress, prioritization and participation in CWPP.	
	5.Q	Provide and maintain a statewide process for documenting fuels projects progress, completion, success and maintenance.	
	5.R	Focus projects in areas to attain desired forest conditions and coordinate with forest health program activities.	
	5.S	Ensure that all projects have an approved fuels/forest health/stewardship plan that includes all aspects of service forestry (State Historic Preservation Officer (SHPO) (threatened and endangered species, prescriptions, actions, etc.).	
	5.T	Provide training for employees and project managers on SHPO and cultural resource identification, reporting methods and clearances.	
	5.U	Work closely with the Tribal communities, local landowners, and the SHPO to obtain clearances and to mark sensitive sites.	

Table 4-2. Mitigation Goals and Strategic Actions			
Goal/Lead Agency	**#**	**Strategic Action**	**Changes and reason for (a) modification, or (b) deletion**
	5.V	Provide assistance to communities and State in planning and implementing long-term sustainable landscape projects.	
	5.W	Restore native and adapted vegetation and work to prevent areas being impacted by non-native or undesirable species conversions through collaborative efforts.	
	5.Y	Use mechanical and hand treatments as well as prescribed fire to assist in attaining desired forest and rangeland conditions.	
	5.Z	Provide native and accepted introduced seed species through the Nevada State seed bank program.	
	5.AA	Provide training for local cooperators for treatment practices and skill acquisition.	
	5.AB	Encourage collaboration at all levels with state, federal and local cooperators.	
	5.AC	Assist communities and State in Burned Area Emergency Rehabilitation, and complete fire damage reclamation reports and public education and outreach to provide the best land management practices available for collaborative land rehabilitation.	
	5.AD	Assess damage to critical watershed and threats to communities' domestic water supplies and mitigate those threats through erosion control practices.	
	5.AE	Supply resources for rehabilitation efforts through the State Tree Nurseries in Las Vegas and Washoe Valley, and the Nevada State seed bank programs.	
	5.AF	Provide training, expertise, and supplies/equipment in a collaborative manner to assist in rehabilitation.	
	5.AG	Provide public education and outreach to communities affected by wildfire.	
	5.AH	Focus fuels projects in communities with extreme or high ratings in CWPP assessments.	
	5.AI	Assist with the development of and the participation in a comprehensive program by which current CWPP or equivalent assessments are updated as projects are completed, ratings change or new at-risk communities arise.	
	5.AJ	Assist in the formulation and dissemination of current information such as Living with Fire documents.	

Table 4-2. Mitigation Goals and Strategic Actions			
Goal/Lead Agency	**#**	**Strategic Action**	**Changes and reason for (a) modification, or (b) deletion**
	5.AK	Encourage community involvement in project completion, participation, and maintenance.	
	5.AL	Assist, encourage and provide guidance to communities in the development of the appropriate fire service organization for their community (i.e. a legally constituted fire protection district or fire department) according to NRS 472.040.	
	5.AM	Assist in acquiring funding for local firefighters for training and equipment through the State Fire Assistance, and Volunteer Fire Assistance when funded by US Forest Service.	
	5.AN	Assist in the planning for and removal of biomass waste on fuels reduction and forest health projects, as well as following wildland fires, flooding and other catastrophic natural event.	
	~~5.AO~~	~~Provide technical assistance in the formation of end users of woody biomass to produce heat and/or power (i.e. Fuels in Schools program) and provide ongoing outreach and education as to the societal benefits associated with utilization of biomass in the State of Nevada.~~	Action no longer valid due to federal funding cutbacks.
	~~5.AP~~	~~Participate in the Nevada State Biomass Working Group, southern Nevada Woody Biomass Collaboration Group, and other state, local, and national biomass committees.~~	Program closed by Dept. of Corrections; Action deleted
	5.AO	Comply with all federal regulations in the funding stream to ensure compliance and future competitiveness.	
	5.AP	Keep apprised of all federal, state, and local regulations.	
	5.AQ	Participate in interagency project planning, implementation and monitoring.	
	5.AR	Protect the envelope of buildings from wildfire.	

The implementation strategy for the Strategic Actions shown in Table 4-2 above is found in Section 4.4, Table 4-10, Strategic Action Plan Matrix. This table includes the lead department/division, potential funding sources, implementation timelines, and economic justification.

4.2 STATE CAPABILITY ASSESSMENT

The requirements for State capability assessment, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: MITIGATION STRATEGY

State Capability Assessment

Requirement §201.4(c)(3)(ii): The State mitigation strategy **shall** include a discussion of the State's pre- and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including: an evaluation of State laws, regulations, policies, and programs related to hazard mitigation as well as to development in hazard-prone areas [and] a discussion of State funding capabilities for hazard mitigation projects … .

Element

Does the new or updated plan include an evaluation of the State's **pre-disaster** hazard management policies, programs, and capabilities?

Does the new or updated plan include an evaluation of the State's **post-disaster** hazard management policies, programs, and capabilities?

Does the new or updated plan include an evaluation of the State's policies related to **development in hazard prone areas?**

Does the new or updated plan include a discussion of State **funding capabilities** for hazard mitigation projects?

Does the updated plan address any hazard management capabilities of the State that have changed since approval of the previous plan?

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

4.2.1 Pre- and Post- Disaster Hazard Management Capability

Table 4-3 below presents the state's capability to mitigate the hazards described in Section 3 and demonstrates pre-and post-disaster hazard management policies, programs, and capabilities. It also presents the state's funding capabilities for hazard mitigation projects - whether it can support, facilitate, or fund such projects. Support implies that the state manages federally-funded programs. The state may also facilitate mitigation programs by providing technical assistance to local, tribal, and other entities. The last column provides details of each listed program or agency and its policies and capabilities to mitigate hazards in the state. In the 2013 iteration of the plan, the State's capability to mitigate hazards has been increased by the addition of 4 programs, one federal and 3 State programs that have been added to Table 4-3 below under the Hazardous Materials section of the Table: the Nevada Brownfields Program, t he Federal Brownfields Program, the Nevada Petroleum Fund, and the Nevada Voluntary Clean-up Program.

Table 4-3. Pre- and Post-Disaster Hazard Management Policies, Programs, and Capabilities

Funding Agency (Federal, State, Local, Private)	Hazard	Program	Type of Hazard Management Capability		State Involvement			Description of Program, Policy, Regulation; links
			Pre-Disaster	Post-Disaster	Support	Facilitate	Funds	
U. S. Housing and Urban Development (HUD)	All Hazards	Community Development Block Grants (CDBG)	√	√	√	√		Grants to develop viable communities, principally for low and moderate income persons. CDBG funds available through Disaster Recovery Initiative. Contingent upon Presidential Disaster declaration http://www.hud.gov/offices/cpd/communitydevelopment/programs/
HUD	All Hazards	Disaster Recovery Assistance		√	√	√		Disaster relief and recovery assistance in the form of special mortgage financing for rehabilitation of impacted homes. http://www.hud.gov/offices/cpd/communitydevelopment/programs/dri/assistance.cfm
HUD	All Hazards	HUD Sustainable Communities Planning Grant Program	√		√	√		This program supports multi-jurisdictional regional efforts that integrate housing, economic development, transportation, water infrastructure and environmental planning, and assists regional entities and consortia of local governments with integrated decision-making. www.hud.gov/sustainability
HUD	All Hazards	HOME Investment Partnerships Program	√	√	√	√		HOME provides formula grants to States and localities that communities use, often in partnership with local nonprofit groups, to fund a wide range of activities that build, buy, and/or rehabilitate affordable housing for rent or home ownership or provide direct rental assistance to low-income people. The construction is up to standard hazard-resistant building codes.

Table 4-3. Pre- and Post-Disaster Hazard Management Policies, Programs, and Capabilities

Funding Agency (Federal, State, Local, Private)	Hazard	Program	Type of Hazard Management Capability		State Involvement			Description of Program, Policy, Regulation; links
			Pre-Disaster	Post-Disaster	Support	Facilitate	Funds	
								http://www.hud.gov/offices/cpd/affordablehousing/programs/home
U. S. Dept. of Agriculture (USDA)	All Hazards	Smith-Lever Special Needs Funding	√		√	√		Grants to State Extension Services at 1862 Land-Grant Institutions to support education-based approaches to addressing emergency preparedness and disasters. http://www.csrees.usda.gov/funding/rfas/smith_lever.html
USDA	All Hazards	Community Facilities Guaranteed Loan Program	√		√	√		This program provides an incentive for commercial lending tol develop essential community facilities, such as fire stations, police stations, and other public buildings. http://www.rurdev.usda.gov/rhs/cf/cp.htm
USDA	All Hazards	Community Facilities Direct Loans Community Facilities Direct Grants	√		√	√		This program provides direct loans for essential community facilities. http://www.rurdev.usda.gov/rhs/cf/cp.htm
USDA	All Hazards	Community Facilities Direct Grants	√		√	√		This program provides grants to develop essential community facilities. http://www.rurdev.usda.gov/rhs/cf/cp.htm

Table 4-3. Pre- and Post-Disaster Hazard Management Policies, Programs, and Capabilities

Funding Agency (Federal, State, Local, Private)	Hazard	Program	Type of Hazard Management Capability		State Involvement			Description of Program, Policy, Regulation; links
			Pre-Disaster	Post-Disaster	Support	Facilitate	Funds	
USDA Farm Service Agency	All Hazards	Farm Service Agency Disaster Assistance Programs		√	√	√		This program provides emergency funding and technical assistance for farmers and ranchers to rehabilitate farmland and livestock damaged by natural disasters. http://www.fsa.usda.gov/
U.S. Department of Health & Human Services	All Hazards	Disaster Assistance for State Units on Aging (SUAs)		√	√	√		This program provides disaster relief funds to those SUAs and tribal organizations who are currently receiving a grant under Title VI of the Older Americans Act. http://www.aoa.gov/doingbus/fundopp/fundopp.asp
U.S. Economic Development Administration (EDA)	All Hazards	Economic Development Administration Investment Programs	√	√	√	√		These programs provide grants that support public works, economic adjustment assistance, and planning. Certain funds are allocated for locations recently hit by major disasters. http://www.eda.gov/AboutEDA/Programs.xml
U.S. Small Business Administration	All Hazards	Small Business Administration Loan Program		√	√	√		This program provides low-interest, fixed rate loans to small businesses for the purpose of implementing mitigation measures. Also available for disaster- damaged property. http://www.sba.gov/services/financialassistance/index.html

Table 4-3. Pre- and Post-Disaster Hazard Management Policies, Programs, and Capabilities

Funding Agency (Federal, State, Local, Private)	Hazard	Program	Type of Hazard Management Capability		State Involvement			Description of Program, Policy, Regulation; links
			Pre-Disaster	Post-Disaster	Support	Facilitate	Funds	
USDA/APHIS/ Veterinary Services	All Hazards	Animal Disaster Program	√	√		√		This program plans and facilitates sheltering of animals during emergency or disaster incidents.
Federal Emergency Management Agency	All Hazard	Hazard Mitigation Grant Program (HMGP)		√	√	√		This program provides grants to implement long-term hazard mitigation measures after a major disaster declaration. http://www.fema.gov/government/grant/hmgp/index.shtm
FEMA	All Hazard	Pre-Disaster Mitigation Grant Program (PDM)	√		√	√		This program provides funds for hazard mitigation planning and implementation of mitigation projects prior to a disaster event. http://www.fema.gov/government/grant/pdm/index.shtm
FEMA	All Hazard	Hazard Mitigation Funding Under Section 406 (Stafford Act)		√	√	√	√	This FEMA program provides funds for the repair of disaster-damaged facilities that directly reduce the potential of future, similar damages to the repaired facility by subsequent disaster events.
FEMA	All Hazard	Emergency Management Performance Grant	√		√	√	√	This program assists in the development, maintenance and improvement of state, tribal and local emergency management capabilities
NDEM	All Hazard	Disaster Relief Fund		√	√	√	√	This fund provides required matching funds for federal grants for local governments.
NDEM	All Hazard	Emergency Assistance Account		√	√	√	√	This account provides required matching funds for federal grants local governments.
US Department of Commerce, Economic Development	All Hazard	Disaster Mitigation Planning and Technical	√		√	√		This provides technical and planning assistance grants for capacity building and mitigation project activities focusing on creating disaster resistant jobs and workplaces.

Table 4-3. Pre- and Post-Disaster Hazard Management Policies, Programs, and Capabilities

Funding Agency (Federal, State, Local, Private)	Hazard	Program	Type of Hazard Management Capability		State Involvement			Description of Program, Policy, Regulation; links
			Pre-Disaster	Post-Disaster	Support	Facilitate	Funds	
Administration		Assistance						www.doc.gov/eda
USDA NRCS	All Hazard	Watershed Program	√		√	√		Through the Watershed Programs NRCS provides technical and financial assistance to States, local governments and Tribes (project sponsors) to plan and implement authorized watershed project plans for the purpose of: watershed protection, flood mitigation, water quality improvements, soil erosion reduction, rural, municipal and industrial water supply, irrigation, water management, sediment control, fish and wildlife enhancement, wetlands and wetland function creation and restoration, groundwater recharge, easements, wetland and, floodplain conservation, hydropower, watershed dam rehabilitation. http://www.nrcs.usda.gov/programs/watershed/index.html
USDA-NRCS	All Hazards	Emergency Watershed Protection Program		√	√	√		The EWP Program assists sponsors, landowners, and operators in implementing emergency recovery measures for runoff retardation and erosion prevention to relieve imminent hazards to life and property created by a natural disaster that causes a sudden impairment of a watershed. http://www.nrcs.usda.gov/programs/ewp/
National Science Foundation (NSF)	All Hazards	Decision, Risk, and Management Sciences Program (DRMS)	√		√	√		This program provides grants for small-scale, exploratory, high-risk research having a severe urgency with regard to natural or anthropogenic disasters and similar unanticipated events. http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5423&org=SES

Table 4-3. Pre- and Post-Disaster Hazard Management Policies, Programs, and Capabilities

Funding Agency (Federal, State, Local, Private)	Hazard	Program	Type of Hazard Management Capability		State Involvement			Description of Program, Policy, Regulation; links
			Pre-Disaster	Post-Disaster	Support	Facilitate	Funds	
Department of Homeland Security (DHS), FEMA, NDCNR Bureau of Corrective Actions (BCA), NDEM	All Hazards	Homeland Security Grant Programs	√		√	√	√	These programs provide funding to assist state, tribal, and local governments to maintain and improve plans, facilities and equipment. They also fund disaster preparedness exercises and training for emergency services.
NBMG	All Hazards	GIS and HAZUS support	√	√	√	√		NBMG provides expertise in HAZUS loss estimation modeling to support mitigation planning efforts and disaster training.
National Science Foundation (NSF)	All Hazards	Hazard Reduction Program			√	√	√	NSF provides funding for research and related educational activities on hazards.
US Department of Health and Human Services (USDHHS) (partners with Nevada Department of Health and Human Services (NDHHS) and State Health Division (SHD))	All Hazards	Emergency Management/ Mitigation Training	√		√	√		This program provides training in disaster mitigation, preparedness, and planning for Public Healthcare http://www.cdc.gov/about/business/funding.htm
ACE, USDA-Farm Service Agency (FSA)	Drought	Drought Assistance	√	√	√	√		Nevada Department of Agriculture coordinates requests for disaster declarations related to drought. The state's Disaster Assistance Account funding may become available for drought declaration assistance.

Table 4-3. Pre- and Post-Disaster Hazard Management Policies, Programs, and Capabilities

Funding Agency (Federal, State, Local, Private)	Hazard	Program	Type of Hazard Management Capability		State Involvement			Description of Program, Policy, Regulation; links
			Pre-Disaster	Post-Disaster	Support	Facilitate	Funds	
Nevada Department of Conservation and Natural Resources, Division of Water Planning	Drought	Nevada Drought Plan	√		√	√		This document establishes a system for determining drought severity and establishes an administrative coordinating system among agencies to help mitigate drought impacts. It also establishes a process for obtaining federal assistance if required.
NDWR, Colorado River Water Commission	Drought		√		√	√		Coordination of water distribution for the Colorado River basin among all interested parties.
USDA Farm Service Agency	Drought	Emergency Conservation Program (ECP)		√	√	√		This program provides emergency funding and technical assistance for farmers and ranchers to rehabilitate farmland damaged by natural disasters and for carrying out emergency water conservation measures in periods of severe drought. http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=ecp
USDA Farm Service Agency	Drought	Emergency haying and grazing		√	?	?		Emergency haying and grazing of CRP acreage may be authorized to provide relief to livestock producers in areas affected by a severe drought. Emergency authorization is provided by either a national FSA office authorization or by a state FSA committee determination utilizing the U.S. Drought Monitor. http://www.fsa.usda.gov/Internet/FSA_File/haying_and_grazing_july2012.pdf

Table 4-3. Pre- and Post-Disaster Hazard Management Policies, Programs, and Capabilities

Funding Agency (Federal, State, Local, Private)	Hazard	Program	Type of Hazard Management Capability		State Involvement			Description of Program, Policy, Regulation; links
			Pre-Disaster	Post-Disaster	Support	Facilitate	Funds	
Southern Nevada Water Authority, Truckee Meadows Water Authority	Drought	Several water conservation and drought mitigation programs	√		√	√	√	Local government and state agencies and consortia have authority to place restrictions on water use and to implement programs for drought mitigation. TMWA offers a information on water conservation at http://www.tmh20.com/conservation/ SNWA offers incentive programs and information to encourage water conservation. http://www.snwa.com/html/cons_index.html
US Environmental Protection Agency (EPA)	Drought and Flood	Clean Water Act Section 319 Grants	√		√	√	√	This program provides grants to state agencies to implement non-point source programs, including support for nonstructural watershed resource restoration activities. http://www.epa.gov/nps/cwact.html
EPA Bureau of Water Quality Planning (BWQP) may have a grant from EPA to fund this type of program/project in NV)	Drought and Flood	Clean Water Act Section 319 Grants	√		√	√	√	This program provides grants to state agencies to implement non-point source programs, including support for nonstructural watershed resource restoration activities. http://www.epa.gov/nps/cwact.html
National Institute of Science and Technology (NIST); FEMA; US Department of Interior, USGS; National Science Foundation (NSF) (Partnering with UNR-	Earthquake	National Earthquake Hazard Reduction program (NEHRP) in Earth Sciences	√		√	√		NEHRP Provides grants for seismic mapping for U.S. HAZUS loss-estimation modeling, fault-hazard identification, liquefaction-hazard identification, landslide-hazard identification, probabilistic seismic hazard analysis, ground-shaking microzonation, basin-effect analysis, earthquake process research. http://www.nehrp.gov/contracts/solicitations.htm

Table 4-3. Pre- and Post-Disaster Hazard Management Policies, Programs, and Capabilities

Funding Agency (Federal, State, Local, Private)	Hazard	Program	Type of Hazard Management Capability		State Involvement			Description of Program, Policy, Regulation; links
			Pre-Disaster	Post-Disaster	Support	Facilitate	Funds	
NBMG, NSL, UNLV)								
Center for Disease Control (CDC), US Dept. of Health and Human Services	Epidemic	Programs for prevention of epidemic disease	√	√	√	√		CDC Provides funding for preparation for and prevention and control of diseases. http://emergency.cdc.gov/
USDA/Animal and Plant Health Inspection Service/ Veterinary Services (Partners with Nevada Dept. of Agriculture)	Epidemic	Animal diseases	√		√	√		USDA conducts tests for State/Federal program of animal diseases, livestock issues related to food safety, and those animal diseases transmissible to man. http://www.aphis.usda.gov/animal_health/ http://agri.nv.gov/index_Animal2.htm
EPA (NDEP has a grant from EPA to manage a Safe Drinking Water Revolving Loan Fund)	Epidemic	Safe Drinking Water Revolving Loan.	√		√	√		This program provides funds to communities, tribes, individuals and others to finance infrastructure improvements to drinking water systems with an emphasis on providing funds to small and disadvantaged communities and to programs that encourage pollution prevention as a tool for ensuring safe drinking water. http://www.epa.gov/safewater/dwsrf/index.html
US Department of Health and Human Services (USDHHS)	Epidemic	The Hospital Preparedness Program (HPP)	√	√	√	√		This program enhances the ability of hospitals and health care systems to prepare for and respond to bioterrorism and other public health emergencies.

Table 4-3. Pre- and Post-Disaster Hazard Management Policies, Programs, and Capabilities

Funding Agency (Federal, State, Local, Private)	Hazard	Program	Type of Hazard Management Capability		State Involvement			Description of Program, Policy, Regulation; links
			Pre-Disaster	Post-Disaster	Support	Facilitate	Funds	
								http://www.hhs.gov/aspr/opeo/hpp/
FEMA (Partners with NDWR, Tribes, local and individuals)	Flood	National Flood Insurance Program	√	√	√	√		This program enables property owners to purchase insurance as a protection against flood losses in exchange for state and community floodplain management regulations that reduce future flood damages. HTTP://WWW.FEMA.GOV/BUSINESS/NFIP
FEMA (Partners with NDWR, Tribes, local and individuals)	Flood	Flood Mitigation Assistance	√		√	√		This program provides funding to implement measures to reduce or eliminate the long term risk of flood damage. http://www.fema.gov/government/grant/fma/index.shtm
FEMA (Partners with NDWR, Tribes, local and individuals)	Flood	Repetitive Flood Claims	√		√	√		This program provides funds to assist States and communities reduce flood damages to insured properties that have had one or more claims to the National Flood Insurance Program (NFIP). http://www.fema.gov/government/grant/rfc/index.shtm
EPA (Partners with NDWR, Tribes, local and individuals)	Flood	Wetlands Program Development	√		√	√		This program provides funds for projects that promote research, investigations, experiments, training, demonstrations, surveys, and studies relating to the causes, effects, extent, prevention, reduction and elimination of water pollution. http://www.epa.gov/wetlands/grantguidelines/
ACE (Army Corps of Engineers) (Partners with Tribes, Div. of Water Resources	Flood	Planning Assistance to States	√		√	√		This program provides funding for the development of plans to conserve water resources, dam safety, flood damage reduction, and flood plain management. http://www.lre.usace.army.mil/planning/assist.html

Table 4-3. Pre- and Post-Disaster Hazard Management Policies, Programs, and Capabilities

Funding Agency (Federal, State, Local, Private)	Hazard	Program	Type of Hazard Management Capability		State Involvement			Description of Program, Policy, Regulation; links
			Pre-Disaster	Post-Disaster	Support	Facilitate	Funds	
(DWR), Carson Water Subconservancy District (CWSD), Truckee River Flood Project (TRFP), Tribes)								
ACE (Partners with Tribes, TRFP, NDWR, Clark County Flood Control Project)	Flood	Flood Plain Management Services	√		√	√		This program provides technical support for effective flood plain management. http://www.lre.usace.army.mil/planning/fpman.html
ACE (Partners with Tribes, locals, NDWR)	Flood	USACE Environmental Laboratory						This program provides guidance for implementing environmental programs as ecosystem restoration and reuse of dredged materials. http://el.erdc.usace.army.mil/products.cfm?Topic=none
USDA	Flood	Emergency Watershed Protection Support Services		√	√	√		This program provides funds for implementing emergency measures in watersheds in order to relieve imminent hazards to life and property created by a natural disaster. www.nrcs.usda.gov./programs/ewp/
USDA	Flood	Watershed Protection and Flood Prevention	√		√	√		This program provides funding for soil conservation, development, utilization and disposal of water, and conservation as well as the proper use and conservation of land. www.nrcs.usda.gov/programs /watershed/index.html

Table 4-3. Pre- and Post-Disaster Hazard Management Policies, Programs, and Capabilities

Funding Agency (Federal, State, Local, Private)	Hazard	Program	Type of Hazard Management Capability		State Involvement			Description of Program, Policy, Regulation; links
			Pre-Disaster	Post-Disaster	Support	Facilitate	Funds	
ACE, EPA	Flood	Aquatic Ecosystem Restoration	√		√	√		The purpose of the program is the development of aquatic ecosystem restoration and protection projects that improve the quality of the environment, are in the public interest, and are cost effective. www.usace.army.mil/howdoi/where.html http://cfpub.epa.gov/fedfund/program.cfm?prog_num=104
USEPA (Partners with DCNR, Bureau of Water Quality Planning(BWQP))	Flood	Wetlands Protection and Development	√		√		√	This Federal grant program supports State, Tribal, and local efforts to protect wetlands by providing funds to enhance existing programs or develop new programs. http://www.epa.gov/owow/wetlands/initiative/#financial
USEPA (Partners with DCNR, Bureau of Safe Drinking Water, Dept. of State Lands)	Flood	Source Water Protection	√		√	√		This program provides funding to states, local and tribes for activities to protect drinking water. http://cfpub.epa.gov/safewater/sourcewater/sourcewater.cfm?action=Programs
FEMA	Flood	National Dam Safety Program	√		√	√		This program provides financial assistance to the states for strengthening their dam safety programs.
FEMA (Partners with NDWR, Tribes, local communities)	Flood	Community Assistance Program - State Support Services Element	√		√	√		This program provides funding to States to provide technical assistance to communities in the National Flood Insurance Program (NFIP) and to evaluate community performance in implementing NFIP floodplain management activities http://www.fema.gov/plan/prevent/floodplain/fema_cap-ssse.shtm

Table 4-3. Pre- and Post-Disaster Hazard Management Policies, Programs, and Capabilities

Funding Agency (Federal, State, Local, Private)	Hazard	Program	Type of Hazard Management Capability		State Involvement			Description of Program, Policy, Regulation; links
			Pre-Disaster	Post-Disaster	Support	Facilitate	Funds	
U.S. Department of Energy Partners with NDEM, DRI, and NDHHS	Hazardous Materials	U. S. Department of Energy's Radiological Assistance Program (RAP)	√		√	√		RAP provides resources (trained personnel and equipment) to evaluate, assess, advise, isotopically identify, search for, and assist in the mitigation of actual or perceived nuclear or radiological hazards. The RAP is implemented on a regional basis, with coordination between the emergency response elements of state, local, and federal agencies. http://nnsa.energy.gov/emergency_ops/print/1709.htm
U.S. Department of Transportation Pipeline and Hazardous Materials Administration (Partners with State Emergency Response Commission (SERC), tribes and local emergency planning committees)	Hazardous Materials	Hazardous Materials Emergency Preparedness (HMEP) Grant Program	√		√	√		The HMEP program provides financial and technical assistance as well as national direction and guidance to enhance State, Territorial, Tribal, and local hazardous materials emergency planning and training. http://www.phmsa.dot.gov/grants-state-programs
SERC Partners with local emergency planning committees and state agencies	Hazardous Materials	Superfund Amendment and Reauthorization Act (SARA) Title III	√		√	√	√	Filing fees for reports submitted pursuant to SARA, Title III provide funding for planning, training and equipment activities in emergency preparedness, prevention, mitigation and response capabilities associated with hazardous chemicals. Eligible applicants include local emergency planning committees (LEPCs) and state agencies. Funding is available to public officials, fire and police personnel, medical personnel, first responders and tribal personnel through the

Table 4-3. Pre- and Post-Disaster Hazard Management Policies, Programs, and Capabilities

Funding Agency (Federal, State, Local, Private)	Hazard	Program	Type of Hazard Management Capability		State Involvement			Description of Program, Policy, Regulation; links
			Pre-Disaster	Post-Disaster	Support	Facilitate	Funds	
								LEPCs. http://serc.nv.gov/
USEPA Partners with Tribes	Hazardous Materials	Hazardous Waste Management grant program	√		√	√		This program supports projects designed to develop and implement hazardous waste management programs that improve the applicant's ability to properly identify, manage, or dispose of hazardous waste. All hazardous waste management activities that address the RCRA Subtitle C "cradle to grave" approach are eligible. http://www.epa.gov/oswer/docs/grants/09-01.pdf
NDEP	Hazardous Materials	Nevada Brownfields Program		√	√	√	√	The Nevada Brownfields Program currently operates a $2 million dollar revolving loan fund intended to help property owners or developers cover the costs associated with the cleanup of sites with environmental contamination. http://ndep.nv.gov/bca/brown_loan.htm
NDEP	Hazardous Materials	Nevada Brownfields Revolving Loan Fund Program		√	√	√	√	The Nevada Brownfields Program currently operates a $900,000 dollar revolving loan fund to help property owners or developers cover the costs associated with the cleanup of sites that are hindered for redevelopment due to environmental contamination and have no viable responsible party. http://ndep.nv.gov/bca/brown_loan.htm
NDEP	Hazardous Materials	Nevada 128(a) Brownfields Program		√	√	√	√	The Nevada 128(a) Brownfields Program provides funding to municipalities and non-profit organizations when there are no viable responsible parties for the assessment and characterization of sites that are abandoned or under developed due to the perception of

Table 4-3. Pre- and Post-Disaster Hazard Management Policies, Programs, and Capabilities

Funding Agency (Federal, State, Local, Private)	Hazard	Program	Type of Hazard Management Capability		State Involvement			Description of Program, Policy, Regulation; links
			Pre-Disaster	Post-Disaster	Support	Facilitate	Funds	
								contamination. http://ndep.nv.gov/bca/brownfld.htm
USEPA	Hazardous Materials	104(k) Brownfields Program		√	√			US EPA provides a wide-range of funding opportunities to municipalities and non-profit organizations that may be used to mitigate potential hazards on eligible Brownfields sites. EPA Region IX also may provide Targeted Site Assessment services with their federal monies for Brownfields projects in the State of Nevada http://www.epa.gov/brownfields/
NDEP	Hazardous Materials	Nevada Petroleum Fund		√				This fund provides reimbursement to the qualified storage tank owner/operators for corrective action costs associated with cleaning up petroleum product releases. http://ndep.nv.gov/bca/petrofnd.htm
NDEP	Hazardous Materials	Nevada Voluntary Cleanup Program		√				This program provides relief from liability to owners who undertake cleanups of contaminated properties under the oversight of the NDEP.. http://ndep.nv.gov/bca/vcpfctsht.pdf
USDA Farm Service Agency (FSA)	Multiple: drought, infestation, flood	Noninsured Crop Disaster Assistance Program (NAP)		√	√	√	?	Provides financial assistance to producers of noninsurable crops when low yields, loss of inventory or prevented planting occur due to a natural disaster. http://www.fsa.usda.gov/Internet/FSA_File/nap_august_2011.pdf

Table 4-3. Pre- and Post-Disaster Hazard Management Policies, Programs, and Capabilities								
Funding Agency (Federal, State, Local, Private)	**Hazard**	**Program**	**Type of Hazard Management Capability**		**State Involvement**			**Description of Program, Policy, Regulation; links**
			Pre-Disaster	**Post-Disaster**	**Support**	**Facilitate**	**Funds**	
USDA Farm Service Agency	Multiple: drought, infestation, flood	Supplemental Revenue Assistance Payments (SURE) Program		√	√	√	?	is authorized by the 2008 Farm Bill to provide assistance to producers suffering crop losses due to natural disasters. SURE is available for crop losses due to natural disasters occurring through Sept. 30, 2011. http://www.fsa.usda.gov/Internet/FSA_File/sure_2011.pdf
SERC Partners with local emergency planning committees and state agencies	Terrorism	United We Stand State License Plates	√		√	√	√	The revenue will be disbursed by the State Emergency Response Commission to provide financial assistance to state or local governments to support preparedness to combat terrorism including planning, training, supplies and equipment efforts. http://serc.nv.gov/

4.2.2 Policies Related to Development in Hazard-Prone Areas

The State of Nevada has not established a statewide land use plan although the state provides guidance to the counties and local communities in legislating policies related to development in hazard-prone areas. However, it is the responsibility of the counties to adopt and enforce building code policies within their jurisdictions. Nevada Revised Statutes require each county to have and maintain a Master Plan that regulates development in hazard-prone areas. In addition, organizations such as the University of Nevada Cooperative Extension and regulating state agencies such as the Division of Water Resources provide a wide array of technical assistance, funding, and support to Nevada communities in the mitigation of hazards.

Nonetheless, the current social and political climates are not conducive to providing the necessary foundation for the State to promote a uniform statewide ~~"s~~mart growth" policy. HMPC attempts to promote ~~"s~~mart growth" in its grant-awarding procedures by considering the subapplicant's existing building codes and regulations when prioritizing proposals for mitigation funding. The State's Notice of Intent requires information about the proposed activity's concurrence with the subapplicant's adopted building codes which is provided to NHMPC members with the proposal. Please see a copy of the Notice of Intent in Appendix I and in Section 8.2., Figure 8-2, page 8-5 for the prioritization criteria.

4.2.3 State Funding Capabilities

Nevada has two sources of funding created by the Legislature to assist with hazard management and mitigation.

1. The Emergency Assistance Account (EAA) provides support to state agencies and local jurisdictions during declared emergencies on the state or local level. In order to receive moneys from the EAA, the applicant must declare an emergency or disaster, have a preliminary damage assessment, and disclose financial records within thirty days or forty-five days depending on jurisdiction type. See Appendix E for a copy of the Nevada Administrative Code 414.105 through 414.140 with detailed information on procedures to obtain funding from this State source.
2. The Disaster Relief Account is a special account intended to stabilize the operation of the state government after a disaster. The Interim Finance Committee administers the account. This account is used to match Federal funding for declared disasters. See NRS 353.2735 and 2755 for details.

4.2.4 Hazard Management Capabilities Changes

The permanent staffing levels in DEM have remained essentially unchanged since the 2010 plan, although temporary staff members have helped with the management of the program. The collaborative approach to mitigation has enabled Nevada's mitigation capability to multiply, since the process involves coordination among government entities at all levels,

including tribal nations. The following paragraphs provide a summary of mitigation activities accomplished since the approval of the last plan.

FEMA's unification of the hazard mitigation programs provided an excellent platform for NDEM and the Nevada Division of Water Resources to join forces in the management of the five programs in Nevada. During the update of this plan, the State Flood Plain Manager and the SHMO have worked together to promote all five programs and provide additional technical assistance to local and tribal government resulting in added number of and improved quality of applications. This resulted in increased funding for the state. In 2012 NDWR ceded the management of the 3 flood programs to NDEM while maintaining a close working relationship for HMA programs.

Since the approval of the previous 2010 plan, more counties and State agencies have become involved in the planning process. This has promoted networking which has led to a greater awareness of existing mitigation programs. This has resulted in better mitigation planning and related activities in the State. In 2004, 5 counties and 3 cities had approved plans. At the beginning of 2013, eleven (11) local counties have plans that have been approved. These include Carson City, Churchill, Clark, Douglas, Elko, Esmeralda, Lincoln, Mineral, Nye, Storey, and Washoe. The remaining six counties in the state are in the process of developing their plans: Eureka, Lyon, Humboldt, Lander, Pershing, and White Pine. Clark County, Carson City and Washoe County updated their earlier existing plans. The State has promoted the cost effectiveness as well as other benefits of a regional planning approach. Washoe and Clark Counties updated their plans with multi-jurisdictional and regional plans to include incorporated cities, school districts, and tribal nations. Nye County has updated their plan to include the Duckwater Tribe as an additional jurisdiction. Churchill County included the City of Fallon in its multi-jurisdictional plan. Additionally, White Pine and Eureka as well as Pershing, Humboldt and Lander counties are regional areas with low populations but similar topography and hazards that have joined together to develop regional multi-jurisdictional plans. This has allowed the state to better manage the planning process including training and support with limited state resources.

The SHMO and the NHMPC are increasing public awareness by convening the NHMPC quarterly committee meetings at locations around the state where the local community stakeholders are invited to participate. At these meetings, local community leaders are invited to give presentations on the area's demographics, government, geography, economic, and social profile. Local emergency managers provide specifics on the area's hazards and capabilities or needs and the area Flood Plain Manager presents local flood hazard information and capabilities if known. The State Geologist or representative presents information regarding the HAZUS-MH runs on earthquakes and the SHMO provides information on the PDM and HMGP grants. NBMG provides MyPlan information and data access details. This provides to the community increased awareness of the programs and funding opportunities and provides the NHMPC information to help with their evaluation of applications. The SHMO continues working closely with fiscal staff to increase efficiency in distributing funds to subgrantees and to improve capability for obtaining the cost share requirements. The SHMO continues to take advantage of the administrative funds allocated by HMA programs.

The table below provides information on the number of PDM applications submitted each year. The SHMO and NHMPC continue to provide technical assistance during the application drafting process. The SHMO annually provides a Grant Application Workshop and a BCA Workshop in both northern and southern Nevada.

Table 4-4. HMA Grant Applications

Year	Type	# Submitted	# Approved
PDM 2007	Planning	3	3
	Project	1	1
PDM 2008	Planning	1	1
	Project	4	1
PDM 2009	Planning	1	0
	Project	4	2
PDM 2010	Planning	4	4
	Project	7	4
PDM 2011	Planning	4	1
	Project	3	1
FMA 2011	Planning	0	0
	Project	1	1
PDM 2012	Planning	2	2
	Project	3	1
PDM 2013 – Accepted by NHMPC but not submitted to FEMA because PDM 2013 remains unfunded.	Planning	1	0
	Project	2	0

The table and figures below provide HMA funding by year in Nevada, including management costs where applicable. The increased local awareness combined with the technical assistance are demonstrated by the increased funding each year. Also evident is the state's reliance on pre-disaster funding sources for the implementation of mitigation plans.

Table 4-5. Mitigation Funding 2001-2013

Year	Funding by Program			Three-Year Total		
	PDM ($)*	**HMGP ($)**	**FMA ($)**	**PDM ($)**	**HMGP ($)**	**FMA ($)**
2001						
2002	297,271	0				
2003	198,125	0		**198,125**	**0**	
2004 – SHMP Approved Oct		523,113				
2005	60,064	392,541				
2006	29,115	413,679		**89,178**	**1,329,333**	
2007 – Update Approved Oct	561,347					
2008	573,173	489,792				
2009	1,067,996			**2,202,515**	**489,792**	
2010	3,515,777					
2011	905,822		1,930,138			
2012	2,598,569			**7,020,168**	**0**	**1,930,138**
2013						
Sub-Total	**$9,807,258**	**$1,819,125**	**$1,930,138**			
Total	**$13,556,521**			**$8,950,306**		

* Funding amounts reflect selected projects. Funding is conditioned on NEPA review

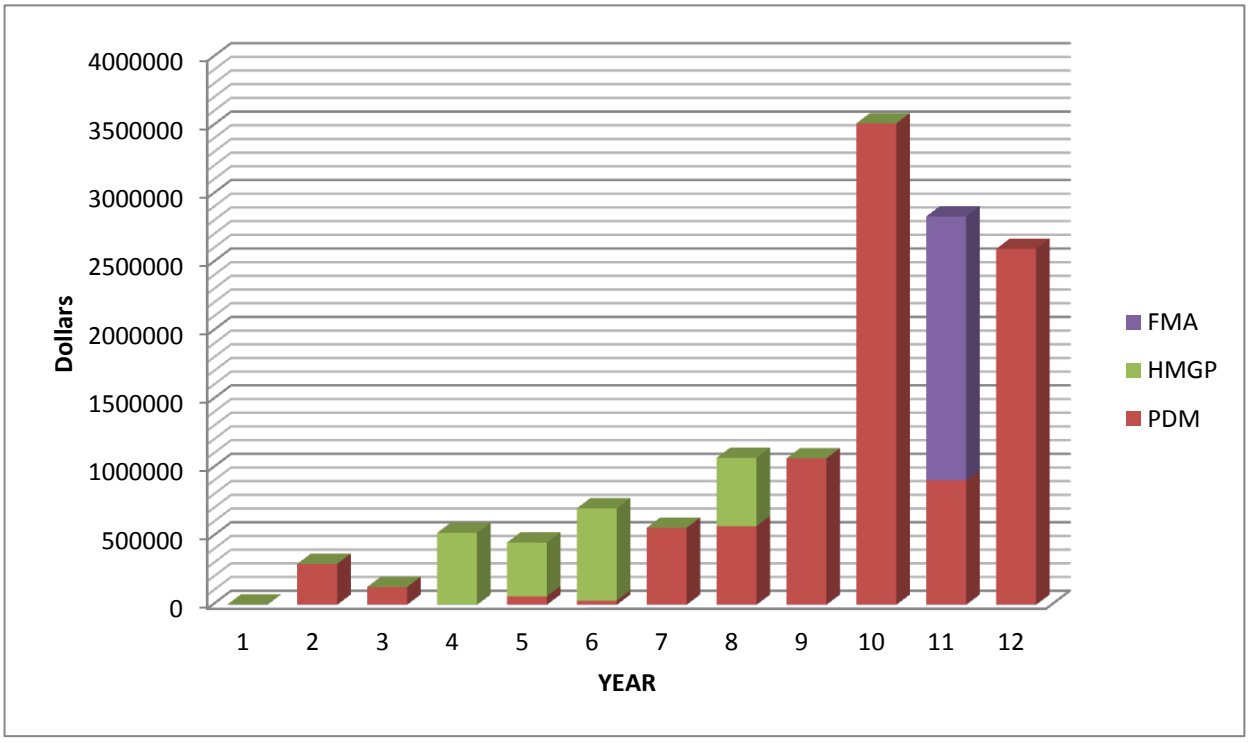


Figure 4-1. PDM, FMA and HMGP Grant Dollars of Funding per Year

The table and figure below provide the PDM, FMA, and HMGP funding by type of mitigation activity and project. Earthquake, flood and wildfire are Nevada's most destructive hazards.

Table 4-6. PDM & HMGP Funding by Hazard Type	
Hazard or Grant Type	**Amount**
Earthquake	$ 513,262.00
Flood	$ 8,169,963.82
Wildfire	$ 2,047,127.29
Public Awareness	$ 36,310.00
Local Planning	$ 562,392.85
NHMPC & State Plan	$ 1,053,602.95
Management	$ 1,005,104.77
Total	$ 13,387,763.68

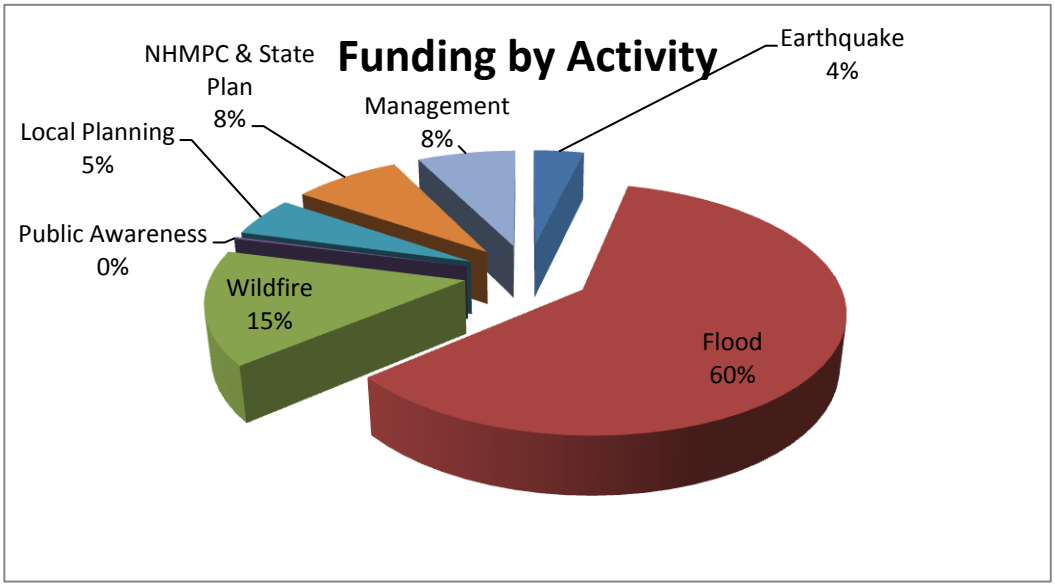
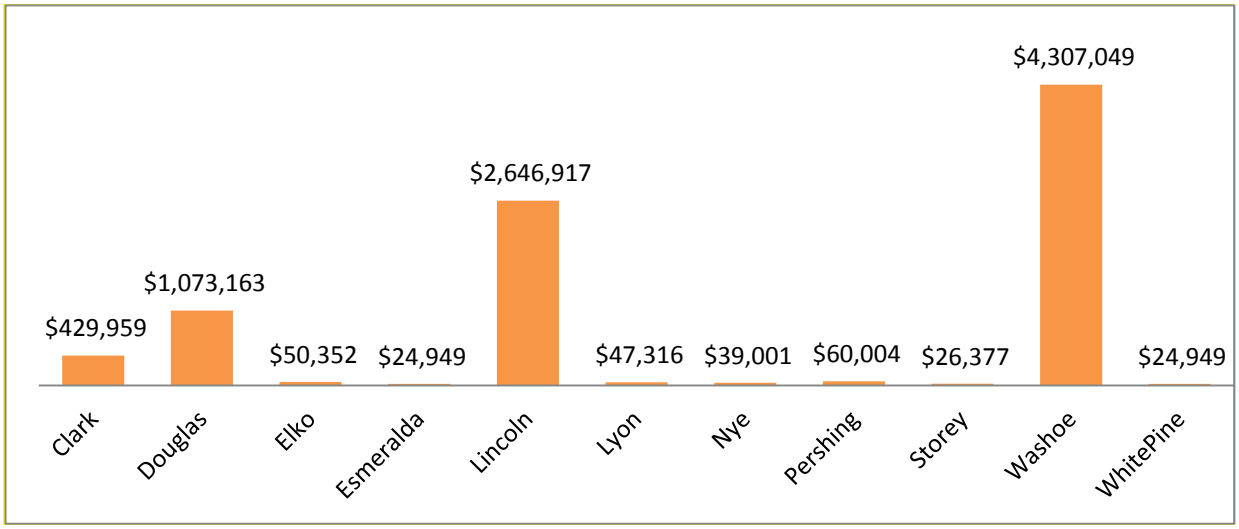


Figure 4-2. PDM, FMA & HMGP Funding by Activity Type

Figure 4-3 below depicts HMA funding by county. Tracking county funding allows the State to provide training and public awareness to counties that are not applying.



Carson, Churchill, Eureka, Humboldt, Lander, and Mineral counties are not shown because they have not received direct HMA funding but may have partnered with other counties.

Figure 4-3. Bar Graph of HMA Funding by County

Currently, the Division of Risk Management and Public Works Division works closely with NDEM, Public Works, and Buildings and Grounds to complete mitigation activities and projects affecting State buildings. This change has an added capability to the State's hazard management programs.

The Nevada Bureau of Mines and Geology first ran HAZUS ~~-~~Loss-Estimation Modeling" earthquake scenarios for each county in Nevada in 2007 and created a new report with similar data for 35 additional towns and cities with population of 500 or greater in 2009. They reran the data using the new revised HAZUS software in 2012 using FEMA's newly revised HAZUS software, but results were inconsistent with some known values. FEMA is currently working to fix problems with the fragility curves that may have caused the inconsistencies, Due to the submission deadlines for this report, the new HAZUS data based on the FEMA HAZUS revisions are not available as of the writing of this plan revision. The new HAZUS numbers will be made available to communities for planning purposes via the MyPlan website as they become available and will be contained in the next iteration of this plan.

There is continued commitment of the Nevada Division of Emergency Management (NDEM), Nevada Division of Water Resources (NDWR), and NHMPC to a comprehensive mitigation program as evidenced by the development of this Plan, the commitment to local mitigation planning, statewide promotion of mitigation, interdepartmental coordination, and

the continuation of training workshops, technical assistance and outreach efforts. Examples of these ongoing efforts are listed below.

1. NDEM- and NDWR coordinate regular training sessions on the five Unified Hazard Mitigation Assistance Programs (HMA) to assist local governments with grant administration, hazard mitigation planning and related duties.
2. NDEM administers pass-through of HMA grant funds to counties and municipalities to develop DMA 2000-compliant hazard mitigation plans.
3. NDEM coordinates the Nevada Hazard Mitigation Planning Subcommittee which is directly responsible for assisting in the development and updating of this plan.
4. NHMPC and NDWR evaluate and prioritize hazard mitigation grant proposals.
5. NHMPC and NDWR provide advice to NDEM in mitigation planning activities statewide.
6. NHMPC and NDWR improve the level of coordination across state agency programs that share objectives that complement the goals of this plan.
7. NDEM continues to develop the mitigation program's GIS capability with support from UNR, Nevada Bureau of Mines and Geology's existing system.
8. NBMG partnering with NDEM provides and enhances risk and vulnerability assessment data for local and tribal governments.
9. NDEM coordinates local annual Tabletop Exercises (TTX) for Hazard Mitigation plan maintenance statewide.
10. NDEM supports Threat Hazard Identification and Risk Assessment (THIRA) activities at the state and local level.
11. NDWR manages and coordinates the Silver Jackets team program.

4.3 LOCAL CAPABILITY ASSESSMENT

The requirements for local capability assessment, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: MITIGATION STRATEGY

Local Capability Assessment

Requirement §201.4(c)(3)(ii): The State mitigation strategy **shall** include a general description and analysis of the effectiveness of local mitigation policies, programs, and capabilities.

Element

Does the **new or updated** plan present a general description of the local mitigation policies, programs, and capabilities?

Does the **new or updated** plan provide a general analysis of the effectiveness of local mitigation policies, programs, and capabilities?

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

4.3.1 Local Capability Description

The Nevada Hazard Mitigation Planning Committee (NHMPC) has been actively working with local governments to identify the most effective strategic actions for hazard mitigation planning. Nevada has a history of being strong on property rights, but support is growing for policies that will help with hazard mitigation. NHMPC identifies those local governments with policies currently in place that include strong hazard mitigation programs and offers them as positive examples to other Nevada communities and local governments in developing their own effective hazard mitigation plans and ordinances. The State provides guidance to these communities, and supports pass-through funds available to communities interested in adopting hazard mitigation actions.

The existing State model codes are shown in Table 4-7 below and local code adoption is found in Table 8-3 in Section 8. Adoption of these codes by local jurisdictions is encouraged and will make local mitigation more effective. As stated above, the NHMPC takes into consideration the adoption of building codes by the community applying for hazard mitigation funding when prioritizing proposals.

Table 4-7. Existing State Model Codes Promoted for Adoption by Local Governments

Policy	Description of Model Codes	Applicability
Building and Fire Codes	The State has adopted a building code and local governments are required to adopt and enforce this code with the exception of Clark County. **NRS 278.580 –** Amend building codes to include seismic provision of the International Building Code. **NRS 461.170 –** Manufactured buildings required to use the various uniform codes. **NRS 477.030 (1)–**Requires the State Fire Marshal to adopt minimum fire and building codes applicable statewide to ensure fire safety. **NRS 477.030 (3) –** The State Fire Marshal and the State Forester adoption of fire retardant roofing requirements in specified areas and the adoption of a wildland-urban interface code in Carson City, Clark, Douglas and Washoe Counties. **NRS 477.030 (12)-**Provides an exception requested by Clark County where the state codes do not apply in that county **NRS 514.040(3) –** Nevada Bureau of Mines and Geology to apply geologic engineering principles to construction, etc. **NRS 623 –** Architecture, Interior Design and Residential Design.	The adoption and enforcement of building and fire codes relates the design and construction of structures to standards established for withstanding wildfires, earthquakes, flooding, dam failure, and high winds.

Table 4-7. Existing State Model Codes Promoted for Adoption by Local Governments		
Policy	**Description of Model Codes**	**Applicability**
Zoning	Laws and ordinances regulate development by dividing the community into zones and by setting development criteria for each zone. **NRS 278.147 –** Conditional use permits for explosive and highly hazardous material manufacturing, handling, processing, and storage facilities. **NRS 278.160 –** Planning and zoning. **NRS 278.580—**Investigation of seismic hazards: fault, fissure, and liquefaction. **NRS 410.095 through 410.210 –** Regulation and restriction of landfills, garbage dumps, and junkyards.	Zoning can keep inappropriate development out of hazard-prone areas and can designate certain areas for such things as conservation, public use, or agriculture. Zoning can also be used to control construction by dedicating areas for cluster development or planned unit development. The State currently works with local governments on implementing these last two policies.
Land Use Planning	Comprehensive land use planning provides a mechanism to prevent development in hazardous areas or allows development in a manner that minimizes damage from hazards. Land use planning gives local governments "the big picture" of what is happening in their jurisdiction. **NRS 278.02521 –** Protecting environmentally sensitive areas **NRS 278.160 –** Planning and zoning. **NRS 278.580—**Investigation of seismic hazards: fault, fissure, and liquefaction. **NRS 321.640 through 321,770 –** Laws to govern growth and use of lands which could impact emergencies. **NRS 324 –** Regulates use of water and reclamation of water projects. **NRS 376A –** Taxes for development of open space land. **NRS 472 –** Fire warden's duties to include preservation of forest and vegetation cover. **NRS 528 –** Regulation of forest practice and reforestation. **NRS 534 –** Planning and development of water resources and management of water resources.	Local governments can use land use planning to identify those areas subject to damage from hazards and work to keep inappropriate development out of those areas. Land use planning can also be used for more regional approach when local governments work together.
Subdivision Regulations	Sets construction and location standards for subdivision layout and infrastructure. **NRS 445D –** Environmental covenants that attach to real property.	Contains standards for such things as storm water management and erosion control
Capital Improvements Planning	Identifies where major public expenditures will be made over the next 5 to 10 years.	Capital Improvement Plans can secure hazard-prone areas for low risk uses, identify roads or utilities that

Table 4-7. Existing State Model Codes Promoted for Adoption by Local Governments		
Policy	**Description of Model Codes**	**Applicability**
		need strengthening, replacement, or realignment, and can prescribe standards for the design and construction of new facilities.

4.3.2 Local Capabilities General Analysis

At this time 12 out of 17 Nevada counties have FEMA-approved mitigation plans. The Subcommittee will integrate the capabilities from local jurisdictions as soon as their completed plans are approved by FEMA. The NHMPC Task Force derived this information from the local jurisdictions' hazard mitigation plans. The following table provides a general summary analysis of the effectiveness of the local capabilities of the completed plans.

Table 4-8. Local and Tribal Capabilities General Analysis				
County	**Effectiveness**			**Comments**
	Legal Regulatory	**Administrative Technical**	**Fiscal**	
Carson City	Excellent	Excellent	Excellent	The awareness of mitigation needs to be enhanced through training and public awareness campaigns. Carson City adopted the most current building codes.
Churchill	Excellent	Very Good	Very Good	Plan approved. Actively working to implement flood mitigation activities.
Clark	Excellent	Excellent	Excellent	They have excellent mitigation actions in flood awareness and prevention. Currently, they are researching earthquake mitigation actions, but already have regulations dealing with faults and fissures. They have one community rated extreme for wildfire risk. The County, State, and Federal agencies implement mitigation activities for wildfire. The most current building codes are in place
Douglas	Very Good	Very Good	Very Good	Douglas has legal, regulatory, and

Table 4-8. Local and Tribal Capabilities General Analysis				
County	**Effectiveness**			**Comments**
	Legal Regulatory	**Administrative Technical**	**Fiscal**	
				fiscal and administrative capability. Coordination and partnerships have improved in the hazard management field. Plan under update process,
Duck Valley Shoshone-Paiute	Good	Good	Good	Plan is approved by FEMA Region X. Hazard Mitigation Program is managed via State of Idaho.
Duckwater-Shoshone	NA	NA	NA	Under development in conjunction with Nye County
Elko	Very Good	Very Good	Very Good	Elko County has the foundation in place to enhance current hazard mitigation strategy. Plan under update process. Implementing local mitigation activities.
Elko Band Council (Te-Moak Tribal Council)	Very Good	Very Good	Very Good	Approved plan in 2011; expires in 2016.
Eureka	NA	NA	NA	Developing a plan with local money.
Esmeralda	Good	Good	Good	Considering the rural nature of this County, they are progressing well in adopting their hazard mitigation plan. Coordination among its agencies improved through the planning process.
Humboldt	NA	NA	NA	Developing a plan
Lander	NA	NA	NA	Developing a plan
Lincoln	Very Good	Very Good	Very Good	Considering the rural nature of this County, they are progressing well in updating their hazard mitigation plan. Coordination among its agencies improved through the planning process and implementing a strategy.
Lyon	NA	NA	NA	Developing a plan
Mineral	Very Good	Good	Very Good	Plan approved in May 2012. First Annual Tabletop exercise took place in May 2013.
Nye	Good	Good	Good	Nye Co. has the ability to adopt regulations. Additional staff and funding for mitigation purposes would

Table 4-8. Local and Tribal Capabilities General Analysis				
County	**Effectiveness**			**Comments**
	Legal Regulatory	**Administrative Technical**	**Fiscal**	
				help the growing population. Update in progress.
Pershing	NA	NA	NA	Developing a plan.
Pyramid Lake Paiute Tribe	Good	Very Good	Good	Developed an approved plan in conjunction with Washoe County.
Reno-Sparks Indian Colony	Good	Good	Very Good	Developed an approved plan in conjunction with Washoe County.
Storey	Very Good	Very Good	Very Good	Approve plan in update process; building codes adopted and funding requests for UHMA selected for further review.
Washoe	Excellent	Excellent	Excellent	Washoe Co. completed a regional hazard mitigation plan to include tribes, and communities have applied for funding to implement strategy.
Washoe Tribe of Nevada and California	Excellent	Excellent	Excellent	First tribe to develop and update their HMP for all their colonies; served as model for other tribes. Approved plan in June 2009, expires in 2014
White Pine	NA	NA	NA	Developing a plan.

The Subcommittee will continue to track and analyze the local jurisdictions' capabilities as their hazard mitigation plans are approved.

4.4 MITIGATION ACTIONS

The requirements for mitigation actions, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: MITIGATION STRATEGY

Mitigation Actions

Requirement §201.4(c)(3)(iii): State plans **shall** include an identification, evaluation, and prioritization of cost-effective, environmentally sound, and technically feasible mitigation actions and activities the State is considering and an explanation of how each activity contributes to the overall mitigation strategy. This section **should** be linked to local plans, where specific local actions and projects are identified.

Requirement §201.4(d): **Plan must be reviewed and revised to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities . . .**

Element

Does the **new or updated** plan identify cost-effective, environmentally sound, and technically feasible mitigation actions and activities the State is considering?

Does the **new or updated** plan evaluate these actions and activities?

Does the **new or updated** plan prioritize these actions and activities?

Does the **new or updated** plan explain how each activity contributes to the overall State mitigation strategy?

Does the mitigation strategy **in the new or updated** section reflect actions and projects identified in local plans?

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

This is the process by which the Subcommittee identified, evaluated and prioritized cost-effective, environmentally sound, and technically feasible mitigation strategy actions

4.4.1 Identification of Cost-Effective, Environmentally Sound, and Technically Feasible Mitigation Actions

To identify strategic actions, we first reviewed the 2010 mitigation strategic actions and projects and requested input from Subcommittee members on any needed additions deletions or changes to the list or any that had been accomplished. Newly identified strategic actions have been added to Table 4-2. Completed mitigation activities are listed in Appendix P.

4.4.2 Evaluation and Prioritization of Strategic Actions and Activities

The standard FEMA-approved STAPLEE process was used as a starting point for the Subcommittee to focus prioritization of action items in the strategic plan. Table 4-9 presents the evaluation criteria of the STAPLEE process as used in development of mitigation strategy.

Table 4-9. STAPLE-E Evaluation Criteria for Ranking Mitigation Strategic Action Items		
Evaluation Category	**Discussion topics**	**Considerations**
Social	Is there public support for the overall mitigation strategy and specific mitigation actions?	Community acceptance; any adverse effects on population
Technical	Is the mitigation action technically feasible and is it a whole or partial solution?	Technical feasibility; long-term solutions; secondary impacts
Administrative	Does the community have the personnel and administrative capabilities necessary to implement the action or will outside help be necessary?	Staffing; funding allocation; maintenance/operations
Political	What do the community and its members feel about issues related to the environment, economic development, safety, and emergency management aspects of the action?	Political support; local champion; public support
Legal	Does the community have the legal authority to implement the action, or must the community pass new regulations?	Local, state, and federal authority; potential legal challenges
Economic	Can the action be funded with current or future internal and external sources? Do the costs seem reasonable for the size of the project, and is enough information available to complete a FEMA Benefit-Cost Analysis?	Benefit/cost of action; contributes to other economic goals; outside funding required; FEMA Benefit-Cost Analysis
Environmental	What is the impact on the environment? Does the action promote a desirable, sustainable and environmentally healthy community for the public?	Effect on local flora and fauna; consistent with community environmental goals; consistent with local, state, and federal laws.

To achieve this, the subcommittee members were given a spreadsheet containing the action items as rows and the items defining STAPLEE as columns. The members ranked the actions using numbers 1 to 5 with 1 being the lowest rating and 5 the highest rating for each specific action and item. The numbers were added and ranked based on a summation of all points received from members providing input. These results for all of the participating members are shown as a column under the Subcommittee Respondents heading.

A review of the results of the STAPLEE prioritization shows that the 102 strategic action items received scores of between 249 and 347 points each from Subcommittee members; The top 25% scoring 293 and above were ranked as ~~H~~High" priority strategic action items. The second quartile (scoring 281 to 292) were ranked as ~~M~~Medium" priority strategic action items and the lower half receiving less than 280 points in the STAPLEE rating process were ranked as ~~L~~Low" priority strategic action items.

The Subcommittee met in a Special Meeting after this ranking was suggested to discuss details and change the priority of any strategic action items that members felt merited special consideration due to particular circumstances not addressed by the numerical modeling. The members discussed the suggested prioritization at the meeting and approved it with no revisions.

The resulting prioritization of strategic actions effectively constitutes the Mitigation Strategy for the State and is listed below in Table 4-10, Strategic Action Plan Matrix. This listing details not only the ranking of strategic action items, but also the lead agencies for each item, possible funding sources for their highest priority actions, implementation timeline and economic justification. The Subcommittee strongly supports any mitigation action for earthquake, flood, and wildfire — those hazards that are rated ~~H~~High" and that affect all Nevada communities.

Although this prioritization presents a general framework for mitigation strategy at the state level, it should not be regarded as a rigid set of guidelines dictating all mitigation activity. Actual mitigation efforts across the state are more often directed by the efforts of the local communities and groups who submit innovative, feasible, fundable grant projects with local matching funds for activities of importance to them at the community level. These projects are deserving of state support whenever possible.

Table 4-10. Strategic Action Plan Matrix; 2013 NHMP Prioritization of Strategic Actions						
Action Number	**Strategic Action Item Description**	**Lead Agency Department/ Division**	**Potential Funding Sources**	**Implementation Timeline**	**Economic Justification**	**Prioritization**
5.D	Provide public education and outreach to educate homeowners in the Wildland Urban Interface (WUI) about proper defensible space practices and landscaping for fire resistance and encourage community involvement in project completion, participation, and maintenance	NDF	HMA, EMPG, FMAG, USDA, BLM, USFS	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
5.A	Protect existing assets, as well as future development, from the effects of wildfire	NDF	HMA, EMPG, FMAG, USDA, BLM, USFS	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
5.AR	Protect the envelop of buildings from wildfire	NDF	USDA, BLM, USFS, NRCS, UNCE, locals, private, FEMA	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
5.M	Assist communities in fuels reduction projects for areas with extreme or high ratings in Community Wildfire Protections Plan (CWPP) assessments	NDF	HMA, EMPG, FMAG, USDA, BLM, USFS, locals	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
5.C	Assist local communities in enacting local ordinances for mitigation and fire prevention	NDF	HMA, EMPG, FMAG, USDA, BLM, USFS	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**

1.A	Improve awareness of the locations, potential impacts and links among hazards, vulnerability and measures to protect life safety and health	DEM, DWR	HMA, EMPG, DHS grant, USFS, FMAG, BLM, Emergency Response Commission, Local fees	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
5.N	Provide funding and service forestry technical assistance through the State Fire Assistance and Hazardous Fuels Reduction programs to reduce fuels on state and private property	NDF	HMA, EMPG, FMAG, USDA, BLM, USFS, locals	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
5.F	Educate and train State and communities in current standards and regulations for proper practices in defensible space and firefighting	NDF	HMA, EMPG, FMAG, USDA, BLM, USFS,UNCE	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
3.G	Encourage seismic retrofit of public safety and critical facilities (both community and State) (such as 911 communications, hospitals, fire, law enforcement and ambulance facilities, etc.)	NESC, NSL, NBMG	HMA, EMPG, USFS, BLM, NDF, Local FD	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
5.AO	Comply with all federal regulations in the funding stream to ensure compliance and future competitiveness	NDF	NDF	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
4.B	Identify and prioritize areas in the State where existing flood hazard mapping is inadequate due to planned and existing significant development and conduct flood hazard mapping in those areas	NDWR, NDEM	RFC, SRL, PDM, HMGP, FMA, EMPG, USACE,NRCS, USDA	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
2.A	Provide technical assistance, guidance, resources and tools to local governments and tribal entities to promote hazard mitigation planning	DEM, DWR	HMA, EMPG	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**

4.G	Upgrade State owned or operated infrastructure (e.g. servicing roads, culverts, bridges, channels, and structures) related to State owned or operated critical facilities to protect critical facilities from flood damages or disruption of essential services	NDWR, NDEM	RFC, SRL, PDM, HMGP, FMA, EMPG, USACE, NRCS, USDA	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
5.AG	Provide public education and outreach to communities affected by wildfire	NDF	USDA, BLM, USFS, NRCS, UNCE, Living With Fire Program, FEMA	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
1.B	Provide current information about hazards, vulnerabilities, mitigation processes and technical assistance for planning and grant availability and application procedures to State and local agencies	DEM, DWR	HMA, EMPG, DHS grant, USFS, FMAG, BLM, Emergency Response Commission, Local fees	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
5.AC	Assist communities and State in Burned Area Emergency Rehabilitation, and complete fire damage reclamation reports and public education and outreach to provide the best land management practices available for collaborative land rehabilitation	NDF	USDA, BLM, USFS, NRCS, USACE, UNCE	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
5.L	Continue to improve fire prevention programs statewide through partnerships with Fire Prevention Association of Nevada, State Fire Marshals Office, University of Nevada, Reno Cooperative Extension, and any other cooperators.	NDF	HMA, EMPG, FMAG, USDA, BLM, USFS	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**

5.G	Ensure proper personal protective equipment, apparatus, equipment and training for career staff and seasonal wildland firefighters.	NDF	FMAG, USDA, BLM, USFS	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
5.B	Identify and recommend changes to State NRS, NAC and communities ordinances and regulations	NDF	HMA, EMPG, FMAG, USDA, BLM, USFS	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
2.G	Promote understanding by the general public of the benefits of hazard mitigation in reducing casualty and property losses and ensuring continuity of businesses, institutional and government functions	DEM, DWR	HMA, EMPG, NHERP, NSF	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
4.K	Install early warning weather stations in watersheds with dams above populated areas	NDWR, NDEM	NWS, NOAA, USGS	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
4.A	Protect existing assets, as well as future development, from the effects of flooding	NDWR, NDEM	RFC, SRL, PDM, HMGP, FMA, EMPG, USACE,NRCS, USDA	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
5.H	Assist volunteer fire departments in attaining funds for proper personal protective equipment, apparatus, equipment and training	NDF	FMAG, USDA, BLM, USFS	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
5.AL	Assist, encourage and provide guidance to communities in the development of the appropriate fire service organization for their community (i.e. a legally constituted fire protection district or fire department) according to NRS 472.040	NDF	USDA, BLM, USFS, NRCS, UNCE, locals, private	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**

5.K	Encourage collaboration on all levels among state, federal and local cooperators, both fire- and resource-related	NDF	HMA, EMPG, FMAG, USDA, BLM, USFS	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
5.AN	Assist in the planning for and removal of biomass waste on fuels reduction and forest health projects, as well as following wildland fires, flooding and other catastrophic natural event.	NDF	USDA, BLM, USFS, NRCS, UNCE, locals, private	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
2.F	Continue to build operational links between hazard mitigation, disaster preparedness and recovery programs with public and private sectors	DEM, DWR,	HMA, EMPG	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
5.AH	Focus fuels projects in communities with extreme or high ratings in CWPP assessments	NDF	USDA, BLM, USFS, NRCS, UNCE, Living With Fire Program, FEMA	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**HIGH**
1.F	Encourage local governments, special districts and tribal organizations to develop, adopt and implement, maintain and update hazard mitigation plans	DEM, DWR	HMA, EMPG	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
3.N	Promote training of volunteer community emergency response teams (CERT) about earthquake risks and possible mitigation activities.	NESC, NSL, NBMG	HMA, NEHRP	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
4.P	Develop Emergency Action Plans to ensure swift coordinated response in the event of an emergency	NDWR, NDEM	RFC, SRL, PDM, HMGP, FMA, EMPG, NRCS, USDA	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
3.M	Promote the Great Nevada Shakeout and earthquake drills throughout the state.	NESC, NSL, NBMG	HMA, NEHRP	ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**

4.E	Assist communities and State with programs to elevate, dry-flood proof or wet-flood proof identified structures to obtain NFIP compliance and/or mitigate repetitive loss structures and severe repetitive loss structures.	NDWR, NDEM	RFC, SRL, PDM, HMGP, FMA, EMPG, USACE,NRCS, USDA	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
2.B	Provide specialized training and exercises to state agency staff and local governments concerning local hazard mitigation planning and the local hazard mitigation plan program	DEM, DWR	HMA, EMPG, CDBG	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
5.AK	Encourage community involvement in project completion, participation, and maintenance.	NDF	USDA, BLM, USFS, NRCS, UNCE, Living With Fire Program, FEMA	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
1.E	Improve communication, collaboration and integration among stakeholders and promote hazard mitigation as an integrated public policy	DEM, DWR	HMGP, EMPG, USGS, BLM, USFS	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
5.E	In highly motivated communities, focus on activities by individual participation in and maintenance of projects (personal responsibility)	NDF	HMA, EMPG, FMAG, USDA, BLM, USFS,UNCE	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
3.P	Improve integration of the emergency management system at all levels of the community bringing forth the “whole community” approach.	NESC, NSL, NBMG	HMA, NEHRP	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
1.C	Encourage the incorporation of mitigation measures into repairs, major alterations, new development and redevelopment practices	DEM, DWR	HMA, EMPG, DHS grant, USFS, FMAG, BLM, Emergency Response Commission, Local fees	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**

4.J	Inventory and inspect existing dams for structural and hydraulic adequacy and implement operational constraints, if warranted.	NDWR, NDEM	RFC, SRL, PDM, HMGP, FMA, EMPG, USACE, NRCS, USDA	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
5.AP	Keep apprised of all federal, state, and local regulations	NDF	NDF	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
5.AQ	Participate in interagency project planning, implementation and monitoring	NDF	USDA, BLM, USFS, NRCS, UNCE, locals, private	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
1.G	Develop a hazard communication system that can be used to rapidly detect and provide early warning for multiple hazards, including earthquakes and wildfires	DEM, DWR	HMA, EMPG, BLM, Nevada Division of Forestry, USFS, SERC, Local Fees	12-18 Months	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
5.AD	Assess damage to critical watershed and threats to communities' domestic water supplies and mitigate those threats through erosion control practices	NDF	USDA, BLM, USFS, NRCS, USACE	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
5.AJ	Assist in the formulation and dissemination of current information such as Living with Fire documents	NDF	USDA, BLM, USFS, NRCS, UNCE, Living With Fire Program, FEMA	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
3.X	Continue to inventory and field-verify unreinforced masonry buildings in Nevada and make this data publicly available to planners and emergency response staff in communities statewide.	NESC, NSL, NBMG	HMA, NEHRP, EMPG, locals	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**

5.J	Coordinate the development of a comprehensive, collaborative program for mutual aid/mobilization of state and local government fire resources	NDF	HMA, EMPG, FMAG, USDA, BLM, USFS	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
5.O	Provide assistance to counties for priority setting and CWPP updating	NDF	HMA, EMPG, FMAG, USDA, BLM, USFS, locals	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
4.L	Assist communities and State in structural mitigation measures, updates, and repairs to dams	NDWR, NDEM	RFC, SRL, PDM, HMGP, FMA, EMPG, USACE, NRCS, USDA	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
3.F	Encourage seismic retrofit of deficient essential structures and infrastructure of community and State critical facilities (economic and lifeline-utilities) to structurally and seismically withstand the effects of earthquakes.	NESC, NSL, NBMG	HMA, EMPG, USFS, BLM, UNR Coop Extension	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
4.D	Retrofit State buildings to meet NFIP standards	NDWR, NDEM	RFC, SRL, PDM, HMGP, FMA, EMPG, USACE, NRCS, USDA	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
5.Y	Use mechanical and hand treatments as well as prescribed fire to assist in attaining desired forest and rangeland conditions	NDF	USDA, BLM, USFS, locals, private	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
3.Z	Identify potential funding sources for earthquake mitigation strategic actions not only at the Federal and State levels but also from private funding and community partnerships.	NESC, NSL, NBMG	HMA, NEHRP, EMPG	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
3.L	Develop earthquake hazard information programs targeting public safety, emergency managers, local government executives, and business and industry.	NESC, NSL, NBMG	HMA, EMPG, USFS, BLM, NDF, Local FD	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**

5.AM	Assist in acquiring funding for local firefighters for training and equipment through the State Fire Assistance, and Volunteer Fire Assistance when funded by US Forest Service.	NDF	USDA, BLM, USFS, NRCS, UNCE, locals, private	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
5.AB	Encourage collaboration at all levels with state, federal and local cooperators	NDF	USDA, BLM, USFS, Living With Fire Program	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**MEDIUM**
2.H	Promote coordination among state agencies, local governments and tribal organizations of regional hazard mitigation activities	DEM, NESC, BMNG,	HMA, EMPG, FEMA,	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
1.D	Promote the modification of structures to meet life safety standards	DEM, DWR	HMA, EMPG	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
4.M	Encourage local ordinances and regulations to reduce encroachment into flood prone zones resulting from dam impoundment or high (non-failure) releases.	NDWR, NDEM	RFC, SRL, PDM, HMGP, FMA, EMPG, NRCS, USDA	Ongoing	Reduce the impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
4.N	Identify hazards of flooding from man-made structures, such as irrigation ditches and canals, and integrate these into local zoning ordinances	NDWR, NDEM	RFC, SRL, PDM, HMGP, FMA, EMPG, USACE, NRCS, USDA	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
3.S	Give planning and special consideration to developing a “Fault Map of Nevada” and identifying all active faults and seismic sources near major urban areas in Nevada.	NESC, NSL, NBMG	HMA, NEHRP	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
5.V	Provide assistance to communities and State in planning and implementing long-term sustainable landscape projects	NDF	USDA, BLM, USFS, locals, private	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**

4.O	Develop laws and regulations that ensure reasonable standards of design and construction to reduce flood hazards	NDWR, NDEM	RFC, SRL, PDM, HMGP, FMA, EMPG, NRCS, USDA	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
3.Q	Provide publications and workshops to promote the exchange of technical information relating to earthquakes among professionals, managers and the citizens of Nevada.	NESC, NSL, NBMG	HMA, NEHRP	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
2.C	Maintain a tracking system for local and state government mitigation plans and projects	DEM, DWR	HMA, EMPG	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
5.AI	Assist with the development of and participation in a comprehensive program by which current CWPP or equivalent assessments are updated as projects are completed, ratings change or new at-risk communities arise.	NDF	USDA, BLM, USFS, NRCS, UNCE, Living With Fire Program, FEMA	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
2.I	Identify, enhance and integrate public education efforts by state and local agencies that have programs directed to hazard mitigation	DEM, DWR	HMA, EMPG, FMA, RFC, local fees	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
4.C	Conduct flood hazard mapping in piedmont and alluvial fan environments	NDWR, NDEM	RFC, SRL, PDM, HMGP, FMA, EMPG, USACE,NRCS, USDA, USGS	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
3.B	Hold workshop on strategies, benefits, risk-reduction opportunities, and challenges associated with the inventory of seismically susceptible buildings	DEM, DWR	HMA, EMPG, FMA	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**

5.W	Restore native and adapted vegetation and work to prevent areas being impacted by non-native or undesirable species conversions through collaborative efforts.	NDF	USDA, BLM, USFS, locals, private	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
3.A	Protect existing assets, as well as future development, from the effects of earthquakes by providing setback criteria for building and development	DEM, DWR	HMA, EMPG, FMA, RFC	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
5.P	Provide a statewide evaluation process for monitoring community progress, prioritization and participation in CWPP	NDF	locals?	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
3.K	Expand earthquake awareness in educational sites such as regional science fairs, and speakers	NESC, NSL, NBMG	HMA, EMPG, USFS, BLM, NDF, UNR Coop Extension	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
3.I	Increase media involvement by networking with partners from all media types such as print, radio, TV, and social media.	NESC, NSL, NBMG	HMA, EMPG, USFS, BLM,	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
5.AE	Supply resources for rehabilitation efforts through the State Tree Nurseries in Las Vegas and Washoe Valley, and the Nevada State Seedbank programs.	NDF	NDF	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
3.Y	Promote coordination among private and public entities to improve statewide earthquake monitoring capabilities.	NESC, NSL, NBMG	HMA, NEHRP, EMPG	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
3.E	Create microzonation of earthquake hazards in Nevada	NESC, NSL, NBMG	HMA, EMPG, USFS, BLM	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**

4.F	Assist communities and State with programs dealing with Repetitive Loss and Severe Repetitive Loss structures; these programs may involve acquisition and demolition; relocation; elevation or other mitigation strategies.	NDWR, NDEM	RFC, SRL, PDM, HMGP, FMA, EMPG, USACE,NRCS, USDA	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
3.O	Promote training of hospital staff about earthquake risks and possible mitigation activities.	NESC, NSL, NBMG	HMA, NEHRP	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
2.D	Provide training to local governments and state agency staff to clarify mitigation measures from response and recovery and preparedness measures	DEM, DWR	HMGP, EMPG, Interoperable Communications, USGS, USFS, BLM, FEMA, BOR	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
5.AF	Provide training, expertise, and supplies/equipment in a collaborative manner to assist in rehabilitation	NDF	USDA, BLM, USFS	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
5.R	Focus projects in areas to attain desired forest conditions and coordinate with forest health program activities	NDF	USDA, BLM, USFS, locals	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
3.V	Create earthquake planning scenarios (Las Vegas and rural areas).	NESC, NSL, NBMG	HMA, NEHRP, EMPG	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
3.W	Determine potential fault rupture characteristics and maximum earthquakes.	NESC, NSL, NBMG	HMA, NEHRP, EMPG	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
3.C	Assist communities and State to retrofit, change occupancy to decrease risk, or demolish susceptible buildings and structures	DEM, DWR	HMA, EMPG, USGS, Interoperable communications, local fees	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**

5.Z	Provide native and accepted introduced seed species through the Nevada State Seedbank program	NDF	USDA, BLM, USFS, locals, private	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
2.E	Maintain a system to allow state agencies with hazard mitigation programs and plans to make recommendations about how local governments can incorporate these in support of the state's mitigation program efforts	DEM, DWR	HMA, EMPG, Local fees, SERC	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
5.I	Participate in research and development of interoperability for emergency response communications	NDF	HMA, EMPG, FMAG, USDA, BLM, USFS	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
3.H	Develop lesson plans or activities for teachers to increase awareness about Nevada's earthquake hazard that tie into the existing science curriculum and align with the science standards for the state.	NESC, NSL, NBMG	HMA, EMPG, USFS, BLM, SHPO,	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
5.S	Ensure that all projects have an approved fuels/forest health/stewardship plan that includes all aspects of service forestry (State Historic Preservation Officer (SHPO) (threatened and endangered species, prescriptions, actions, etc.)	NDF	USDA, BLM, USFS, locals	ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
3.AA	Develop a set of model codes and regulations that would be presented after a major earthquake occurs in Nevada.	NESC, NSL, NBMG	HMA, NEHRP, EMPG	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**

4.I	Inventory existing dams and add to the inventory as dams are discovered or constructed.	NDWR, NDEM	RFC, SRL, PDM, HMGP, FMA, EMPG, USACE, NRCS, USDA	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
4.H	Protect existing assets as well as future development from the effects of dam failure	NDWR, NDEM	RFC, SRL, PDM, HMGP, FMA, EMPG, USACE, NRCS, USDA	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
5.Q	Provide and maintain a statewide process for documenting fuels projects progress, completion, success and maintenance	NDF	locals?	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
3.U	Enhance implementation of nonstructural remediation.	NESC, NSL, NBMG	HMA, NEHRP	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
5.AA	Provide training for local cooperators for treatment practices and skill acquisition	NDF	USDA, BLM, USFS, locals, private	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
5.U	Work closely with the Tribal communities, local landowners, and the SHPO to obtain clearances and to mark sensitive sites	NDF	USDA, BLM, USFS, locals, private	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
3.T	Establish a “lifelines and transportation” workgroup.	NESC, NSL, NBMG	HMA, NEHRP	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
3.R	Promote a post-earthquake technical clearinghouse through planning and established practices.	NESC, NSL, NBMG	HMA, NEHRP	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
3.J	Provide Applied Technology Council (ATC) training and develop formalization of the process	NESC, NSL, NBMG	HMA, EMPG, USFS, BLM, UNR Coop X	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**

5.T	Provide training for employees and project managers on SHPO and cultural resource identification, reporting methods and clearances	NDF	BLM, USFS	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**
3.D	Create planning for "special consideration zones" for Nevada communities	DEM, DWR	HMA, EMPG, USGS, FMA, FEMA, local fees	Ongoing	Reduce economic impact of hazards on infrastructure and reduce loss of life and injury	**LOW**

The Subcommittee will continue to evaluate all the listed strategic action items during its quarterly meetings for validity and revise the related plan sections accordingly. Any significant revisions will be submitted to FEMA as they occur.

The action items provided by each of the lead agencies participating in the Planning Subcommittee meetings fall into one of the following broad mitigation strategy categories.

Prevention: These strategic activities are especially effective in areas where development has not occurred or capital improvements have not been substantial. For example:

- Planning and zoning
- Hazard mapping
- Building codes
- Studies, data collection and analysis
- Open space preservation
- Floodplain regulations
- Storm water management

Property Protection: Examples of activities for property protection are listed below. These actions enable structures to better withstand hazard events or remove structures from hazardous locations.

- Acquisition
- Relocation
- Building elevation
- Critical facilities protection and/or hardening
- Retrofitting
- Insurance

Natural Resource Protection: These activities reduce the impact of hazards by preserving or restoring the natural function of environmental systems. These measures serve the dual purpose of protecting lives and property while enhancing environmental goals. These activities are usually carried out by parks, recreation or conservation organizations.

- Floodplain protection
- Fire resistant landscaping
- Fuel breaks
- Watershed protection

Structural Projects: These projects modify the physical environment of the structures to lessen the impacts of a hazard.

- Levees/dikes/floodwalls
- Reservoirs
- Diversion, detention, retention dams

Emergency Services: These activities are generally not considered as mitigation

techniques, but they minimize the impact of a hazard on people and property.

- Warning system
- Evacuation planning and management

Public Information and Awareness: These activities are used to advise residents, business owners, visitors and government officials about hazards, hazardous areas, and mitigation techniques used to protect life and property.

- Outreach and education
- Training
- Public service announcement

4.4.3. Actions in Local Plans & State Mitigation Strategy

The NHMPC's quarterly meetings are now being conducted at a different county each quarter. A list of the local planning area goals and actions, when available, is provided to the NHMPC members prior to the meeting, providing them with background on mitigation strategy identified by the locals. It also provides input for NHMPC to reflect these local mitigation strategies in the state goals and objectives.

Although local agencies are independent in their development of mitigation goals and actions, the state provides a plan format as a recommended guide. The plan format provides a sample list of mitigation goals and objectives that mirror the state strategy. The final local actions are reviewed by Planning Subcommittee members and NHMPC as each local plan is submitted. This dual process of similar goals and actions provide familiarity and supports the development of concurrent action items for both state and local plans.

Some tribal entities have chosen to develop mitigation plans as governmental entities at the State level and their planning process did not include a review by the State of Nevada. They received their funding directly from FEMA. Nevada provides technical assistance to tribal entities only when requested. When the information on goals and actions is available NDEM will distribute it to the NHMPC members.

4.5 FUNDING SOURCES

The requirements for funding sources, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: MITIGATION STRATEGY

Funding Sources

Requirement §201.4(c)(3)(iv): The State mitigation strategy **shall** include an identification of current and potential sources of Federal, State, local, or private funding to implement mitigation activities.

Element

Does the **new or updated** plan identify **current** sources of Federal, State, local, or private funding to implement mitigation activities?

Does the **new or updated** plan identify **potential** sources of Federal, State, local, or private funding to implement mitigation activities?

Does the updated plan identify the sources of mitigation funding used to implement activities in the mitigation strategy since approval of the previous plan?

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

4.5.1 Current Funding Sources

Since 2010, the State of Nevada has used the funding sources shown in the table below for mitigation activities. Local jurisdictions supply matching funds and at times fully support mitigation activities without assistance from Federal or State resources. The rural counties have less economic, administrative, and technical capability to manage and support mitigation activities. The more populous counties, Clark, Carson City, Douglas, Washoe and to a limited extent, Elko have programs that support mitigation activities, such as paid fire departments, flood control districts and the ability to enforce land-use regulations. For additional sources of funding currently available for mitigation activities, see Table 4-3 in Section 4.2.1. This table will be updated as the Subcommittee finds new funding sources to implement mitigation activities.

Table 4-11. Current Funding Sources for Strategic Mitigation Actions	
Description	**Comments**
Clark County Flood Control District	Develops flood control projects countywide
FEMA	For pre-disaster and post-disaster mitigation and emergency funding, HMGP, PDM, FMA, RFC, FMAG
National Weather Service	Early warning public announcements ***(new in 2012)***
Nevada Division of Forestry	Administers funding from FEMA, BLM, and U.S. Forest Service for wildfire emergency and mitigation funding, except for HMGP and PDM ***(new in 2011)***
Nevada Earthquake Safety Council	Allocates FEMA money for earthquake mitigation efforts
Nevada State Emergency Response Commission (SERC)	Administers state and federal money for pre-disaster funding in mitigation efforts for Hazardous Materials and Terrorism (***newly identified in 2012)***
Nevada Mining Association, Newmont Gold, Barrick Mines, and other individual mining companies.	Donations, public awareness, and/or mitigating their structures for hazard safety ***(new in 2012)***
Private individuals	Provide labor and matching costs for mitigation activities.
Southern Nevada Water Authority	Provides incentives to preserve water ***(new in 2012)***
Truckee Meadows Water Authority	Regulates the use of water in the Truckee Meadows
Truckee River Flood Management Authority	Responsible for implementing the "Living River" project that eliminates flood risk throughout the Truckee River.
U. S. Army Corps of Engineers (ACE)	Mitigation and emergency funding for any navigable river, stream, or waterway ***(new in 2011)***
U. S. Bureau of Land Management	Funding for plans and projects for wildfire and urban-wildfire interface
U. S. Forest Service	Provides emergency and mitigation funding for wildfire
U. S. Geological Survey	UNR and UNLV have participated in the external grants program of the USGS portion of the National Earthquake Hazard Reduction program.
U. S. HUD Community Development Block Grants (CDBG)	State-administered Small Cities CDBG grants program to smaller units of local government for community development activities. Annually, each State develops funding priorities and criteria for selecting projects to address a wide range of community development needs including hazard mitigation ***(newly identified in 2012)***
United We Stand	Special License Plate that funds first responder training and equipment. ***(new in 2012)***
Volunteer Fire Departments (local and paid)	Local fundraisers and local jurisdictions; general fund ***(newly identified in 2012)***

4.5.2 Potential Funding Sources

In addition to Federal agencies already providing hazard mitigation funding (see Table 4-3, Section 4.2.1), Table 4-12 lists several potential funding sources in the private sector for mitigation activities. This table will be updated as the Subcommittee discovers new potential funding sources for implementing strategic mitigation activities.

Table 4-12. Potential Funding Sources for Strategic Mitigation Activities	
Private Sources	**Comments**
Casinos	Donations, public awareness, and/or mitigating their structures for hazard safety
Construction (New Development) Companies, Contractors	Donations, public awareness, and/or mitigating their structures for hazard safety
Federal Emergency Management Agency	Through the PDM and the HMGP funded local jurisdiction hazard mitigation plans, FMA, CAP, National Dam Safety Program, NFIP and flood modernization programs, etc.
Housing and Urban Development	CDBG
Intermountain Farmers Association, Nevada Cattlemen's Association, etc.	Public awareness and/or mitigating their structures for hazard safety
Local communities/districts	Fire districts, school districts, general improvement districts, county and city governing authorities have all provided in-kind or cash matching sources for all the activities accomplished through federal sources.
Local media	Offering free public safety announcements
National Science Foundation	Earthquake risk reduction
Private Insurance Companies Farmers Insurance, AIG, Allstate, etc.	Public awareness, incentives for mitigation activities, and mitigation training.
U. S. Army Corps of Engineers	Design and construction of local flood control projects, riverbank protection, floodplain management, etc.
U. S. Department of Agriculture	Waterway protection from erosion: EQIP, WHIP, AMA, CSP,CRP
U. S. Department of Agriculture	Invasive species protection programs: EQIP, WHIP, GRP,WRP, CSP,CRP
U. S. Department of Agriculture	Wildfire protection programs: HERP, EQIP, WHIP, GRP,WRP, CSP , AMA
U. S. Department of Agriculture	Animal disease, rural development, flood control projects, etc.
U. S. Department of Agriculture	Severe wind damage protection: EQIP, WHIP, CSP
U. S. Department of Energy	Stream gauging, flood monitoring, disaster mitigation planning and technical assistance, disaster resistance jobs and workplaces, etc.
U. S. Department of Health and Human Services	Medical emergency management and mitigation, training and preparedness, etc.
U. S. Environmental Protection Agency	Wetlands protection, emergency watershed protection, Clean Water Act, etc.
U. S. Bureau of Land Management	Funded CWPPs and WUIs
U. S. Geological Survey	Earthquake hazard reduction, mapping, etc.

4.6 Repetitive Loss and Severe Repetitive Loss

This Section addresses the State's strategy for mitigation of repetitive loss properties including Severe Repetitive Loss properties.

DMA 2000 REQUIREMENTS: PREREQUISITES

Severe Repetitive Loss Strategy

Requirement §201.4(c)(3)(v): A State may request the reduced cost share authorized under §79.4(c)(2) of this chapter for the FMA and SRL programs, if it has an approved State Mitigation Plan…that also identifies specific actions that the State has taken to reduce the number of repetitive loss properties (which **must** include severe repetitive loss properties), and specifies how the State intends to reduce the number of such repetitive loss properties.

Element

Does the new or updated plan describe State mitigation goals that support the selection of mitigation activities for repetitive loss properties (see also Part 201.4(c)(3)(i)?

Does the new or updated plan consider repetitive loss properties in its evaluation of the State's hazard management policies, programs, and capabilities and its general description of the local mitigation capabilities (see also Part 201.4(c)(3)(ii))?

Does the new or updated plan address repetitive loss properties in its risk assessment (see also Part 201.4(c)(2))?

Does the new or updated plan identify, evaluate and prioritize cost-effective, environmentally sound, and technically feasible mitigation actions for repetitive loss properties (see also Part 201.4(c)(3)(iii))?

Does the new or updated plan describe specific actions that have been implemented to mitigate repetitive loss properties, including actions taken to reduce the number of sever repetitive loss properties?

Does the new or updated plan identify current and potential sources of Federal, State, local, or private funding to implement mitigation activities for repetitive loss properties(see also Part 201.4(c)(3)(iv))?

Requirement §201.4(c)(3(v): *In addition, the plan* ***must*** *describe the strategy the State has to ensure that local jurisdictions with severe repetitive loss properties take actions to reduce the number of these properties, including the development of local mitigation plans.*

Element

Does the new or updated plan provide a description of the State process to support, through funding and technical assistance, the development of local mitigation plans in communities with severe repetitive loss properties (see also Part 201.4(c)(4)(i))?

Does the new or updated plan include considerations for repetitive loss properties in its criteria for prioritizing communities and local jurisdictions that would receive planning and project grants under available mitigation funding programs (see also Part 201.4(c)(3)(iii))?

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

Legislative changes made in the Biggert-Waters Flood Insurance Reform Act of 2012 define a **Severe Repetitive Loss** (SRL) property as a **structure** that:

(a) is covered under a contract for flood insurance made available under the NFIP and

(b) Has incurred flood-related damage

(i) For which four or more separate claims made available under flood insurance coverage with the amount of each such claim exceeding $5,000, and the cumulative amount of such claims payments exceeding $20,000; or

(ii) For which at least 2 separate claims payments have been made under such coverage, with the cumulative amount of such claims exceeding the market value of the insured structure.

A **Repetitive Loss Property** is a structure covered by a contract for flood insurance made available under the NFIP that:

(a) Has incurred flood-related damage on 2 occasions, in which the cost of the repair, on the average, equaled or exceeded 25% of the market value of the structure at the time of each such flood event; and

(b) At the time of the second incidence of flood-related damage, the contract for flood insurance contains increased cost of compliance.

Existing National Flood Insurance Program data for the State of Nevada indicate that there is currently one Severe Repetitive Loss property in the State that fulfills the criteria defined above.

The Nevada Hazard Mitigation Plan Subcommittee will continue to monitor data from the National Flood Insurance Program to identify any SRL properties in the State. The goal is to address any repetitive flood structure to avoid it becoming an SRL. Should the State develop any additional SRL properties in the future, the following strategy will be followed to mitigate such SRL occurrences.

4.6.1 Goals that Support Mitigation Activities for Repetitive Loss Properties

State mitigation goals that support the selection of mitigation activities for repetitive loss properties are Goal 1 – Reduce the loss of life and injuries, and Goal 4 – Reduce the possibility of damage and losses due to flooding. See Section 4.1.2 for more detail on goals and actions.

4.6.2 Repetitive Loss and State & Local HM Policies, Programs & Capabilities

Section 4.2.1, Table 4-3 provides Nevada's policies, programs and capabilities for flood hazards. Additionally, NDWR manages floodplain managers. NDWR works with local communities to address NFIP issues and flood mapping. This provides communities with guidance and assistance in hazard mitigation projects.

4.6.3 Repetitive Loss Properties in Risk Assessment

Table 3-17 in Section 3.3.7.3.2 provides a summary of repetitive loss and severe repetitive loss properties due to flood for each community in Nevada. Section 3.3.7.3.3 provides a description of partnerships and stakeholders with whom Nevada copperates to reduce repetitive losses from floods.

4.6.4 Mitigation Actions for Repetitive Loss and Severe Repetitive Loss Properties

Section 4.1.2., Table 4-2, Goal 4, Action item 4.E and 4.F provide actions effective in mitigating and reducing the flood hazard in repetitive loss and severe repetitive loss properties in Nevada. Specifically:

Action item 4.E: ~~-~~Assist communities and State with programs to elevate, dry-flood proof or wet-flood proof identified structures to obtain NFIP compliance and/or mitigate repetitive loss structures and Severe Repetitive Loss structures, ~~-~~and

4.F ~~-~~Action 4.F: ~~–~~Assist communities and State with programs dealing with Repetitive Loss and Severe Repetitive Loss structures; these programs may involve acquisition and demolition; relocation; elevation or other mitigation strategies." The STAPLEE process was used to prioritize actions.

4.6.5 Specific Actions Implemented to Mitigate Repetitive Loss Properties

See Section 3.3.7.3.3 and Appendix P, page 2 for examples of actions implemented in Nevada to mitigate repetitive loss properties. In addition, the Truckee River Flood Management Authority (TRFMA) purchased a parcel that contains repetitive loss structures. Through NDEM, TRFMA applied for a PDM 2010 grant to demolish these structures along the Truckee River and this project has now been completed. Using HMGP funds, repetitive loss property located along the Truckee River at the Lockwood Mobile Home Park was purchased thus eliminating repetitive loss structures.

The TRFMA is applying for funding in 2013 to elevate flood-prone residences in the Hidden Valley area of Washoe County.

In a separate area within the Carson River Special Flood Hazard Area, residences located in flood-prone areas were elevated.

In 2012, Nevada applied for its first FMA funding. The application was selected for further review and is currently in the NEPA process.

4.6.6 Funding for Repetitive Loss Properties

Sections 4.5.1 and 4.5.2 identify current and potential sources of Federal, State, local, and private funding to implement mitigation activities for repetitive loss properties.

This section provides a description of the State of Nevada's support in the development and maintenance of local mitigation plans. *Major accomplishments in this section since the last iteration of the NHMP include the following:*

- *Four counties have updated their hazard mitigation plans*
- *Five more counties have plans under development*
- *The State has developed and successfully implemented a "TableTop Exercise" (TTX) for updating of local plans*
- *Successfully developed and used the MyPlan website for the exchange of hazard mitigation data with local and tribal entities*
- *Integrated local HMP data into the current Enhanced State Plan*

5.1 LOCAL FUNDING AND TECHNICAL ASSISTANCE

The requirements for local funding and technical assistance for the development of local mitigation plans, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: COORDINATION OF LOCAL MITIGATION PLANNING

Local Funding and Technical Assistance

Requirement §201.4(c)(4)(i): The section on the Coordination of Local Mitigation Planning **must** include a description of the State process to support, through funding and technical assistance, the development of local mitigation plans.

Element

Does the **new or updated** plan provide a description of the State process to support, through funding and technical assistance, the development of local mitigation plans?

Does the updated plan describe the funding and technical assistance the State has provided in the past three years to assist local jurisdictions in completing approvable mitigation plans?

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

5.1.1 Development of Local Mitigation Plans

The primary goal of the NHMPC is to ensure that every community in Nevada, develops a hazard mitigation plan and maintains it in a current, updated status. The NHMPC believes that the planning process is the first step in awareness of the risk and vulnerability posed by the hazards and provides the communities with a method to "do something about the risk." This goal includes the updating of existing plans and enhancing the data available for locals to use in the update process. The State provides technical assistance in the development of local mitigation plans in all communities including those with severe repetitive loss properties. Through 2012, every plan needing an update has acquired funding through the application process, and, where needed, communities have joined together to develop regional plans. Since the previous state plan was approved in 2010, funding received for planning has allowed one county to develop a new plan, five counties to develop two

separate regional plans, and four to update their current plans. As a result, Nevada has reached its goal of all counties developing or updating hazard mitigation plans by 2013. Nevada has also developed plans to cover 4 more of the 26 tribal entities in the past 3 years whereas only two were covered in the previous period, for a total of six.

Planning funds have been "shared" by more than one community in several instances. For example, in 2012, Humboldt, Lander and Pershing counties are developing a regional plan under the approved PDM 2011 funding, and White Pine and Eureka counties are developing a joint regional plan under a PDM 2010 Grant. This leveraging of grant monies to develop regional plans is a very cost-effective way for rural communities to work together to become covered by a mitigation plan.

Eleven counties in the state have approved plans and the remaining six are currently developing hazard mitigation plans under approved HMA grant funding. Of the eleven with approved plans, three counties' plans are being updated in a timely manner. The status of hazard mitigation plans and updates for all 17 counties is shown pictorially in Figure 5-1:

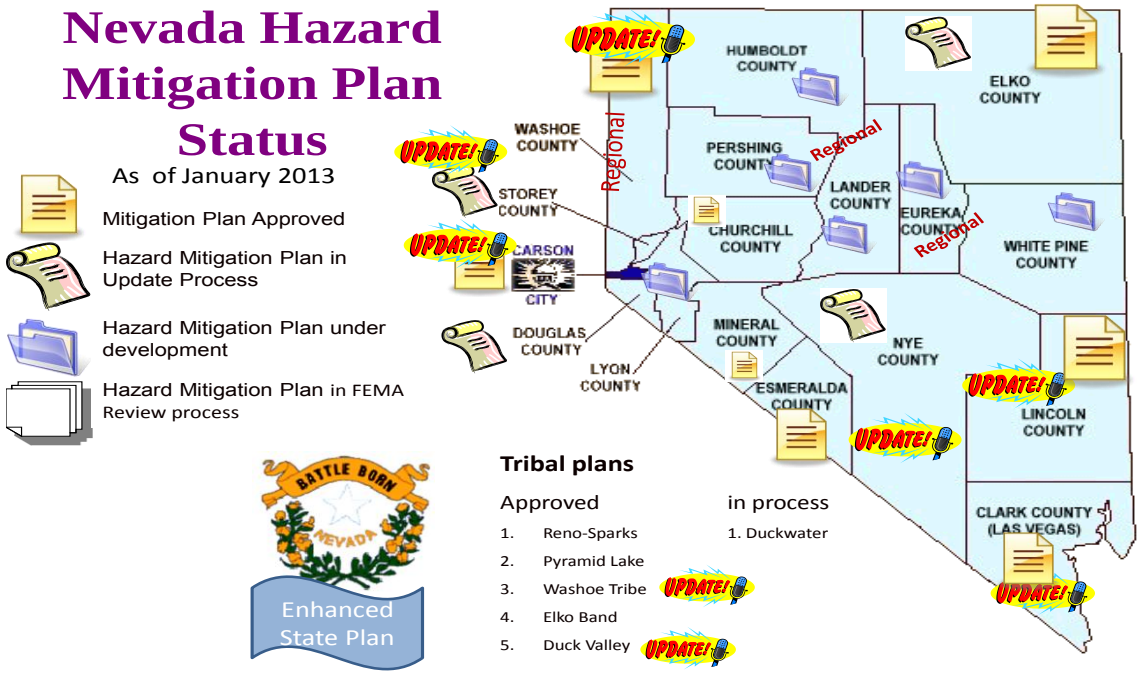


Figure 5-1. Map of Counties and LHMP Status

Since the last NHMP was approved:

- Lyon County is finalizing development of their plan.
- Churchill and Mineral County plans were approved in 2012 under a PDM 2010

planning grant. These planning efforts were helped by NHMPC traveling to rural counties to conduct the quarterly meeting.

- White Pine County and Eureka County are jointly developing a regional plan. The plan is funded by a PDM 2010 grant to White Pine County and Eureka County is matching the grant with cash.
- Pershing, Humboldt, and Lander Counties were awarded a PDM 2011 planning grant to develop a regional plan. These planning efforts were helped by NHMPC traveling to rural counties to conduct the quarterly meeting.
- FEMA approved updates for the following county plans: Carson, Clark, Lincoln, and Washoe.

The following counties are in the process of updating plans: Douglas, Elko, Nye, and Storey.

A TTX is scheduled with Esmeralda County in summer 2013.

Nevada's SHMO and NHMPC are currently working to assist the tribal nations in developing hazard mitigation programs. Since the last iteration of the NHMP, hazard plans have been developed that cover the Reno-Sparks tribe, the Pyramid Lake Paiute tribe, Elko Band, sometimes singly and sometimes in conjunction with other community plans. Plans for Duck Valley Shoshone-Paiute tribe and Washoe tribe of Nevada and California were updated. With the assistance of the State Tribal Liaison, mitigation staff continues to meet with tribal emergency managers to discuss development and/or update of mitigation plans. As with any community, awareness and the readiness of the community is the first step in beginning the planning process. A TTX is scheduled with Elko Band Council in April 2013.

Nevada's Local Hazard Mitigation Planning Process

With the elimination of pre-disaster hazard mitigation funding, NDEM is limited to providing technical support for local planning efforts. These efforts are supported by Cooperating Technical Partners (CTP) and Management Cost funds. The SHMO does outreach through visits to the targeted communities and personal meetings with emergency managers, planners, public works directors and county commissioners of all Nevada communities to build awareness about the hazard mitigation plan requirements and process. Once the local jurisdiction has established resources and committed to the planning process, the SHMO assists in obtaining funds for the development and/or updating of the plan. Technical support from the state continues throughout the application process and plan development and/or update. Under the unified Hazard Mitigation Assistance (HMA) program, NDEM works together with the help and guidance of NDWR staff in administering and processing all five hazard mitigation grant (HMA) programs to ensure that Nevada's subgrantees follow the same process when applying for funding under the HMA and both agencies provide outreach together.

Nevada's established methodology for technical support for the development and maintenance of local plans is as follows:

- SHMO and staff attend local planning meetings in rural venues to ascertain their needs and capabilities, and to develop local points of contact.
- SHMO and staff act as liaison with consultants and local entities to ensure information is provided promptly and accurately.
- NDEM provides risk assessment data and access to experts in the all hazard fields specific to the local jurisdictions. It also provides risk assessment data on flood, wildfire and earthquake hazards through the MyPlan website. (MyPlan is a FEMA-funded GIS-based website developed by NBMG to assist local planning professionals with hazard data necessary to address the risk and vulnerability assessment information required for hazard mitigation planning in their communities. For additional details see Section 8.6.2).

For plan maintenance, NDEM staff developed a Table Top Exercise (TTX) to facilitate annual evaluation of approved local hazard mitigation plans. NDEM staff demonstrates this exercise at established Local Emergency Planning Committee (LEPC) meetings where there is already a broad cross-section of community leaders in attendance without requiring an additional meeting. State Emergency Response Commission requires that the LEPC meetings include representatives from local law enforcement, fire departments, hospitals, elected officials, and the private sector.

The primary benefit of the TTX has been to educate individuals not involved in the original planning process about hazard mitigation actions for the community. Where it has been implemented, this exercise has also proved its usefulness in generating requests from the participating local individuals about hazard mitigation activities. As one example, Lincoln County requested information on seismic retrofits of mobile homes as a result of the TTX. As another example, as a result of the TTX, Storey County decided to ground-truth URM data presented at the exercise.

The TTX is compliant with the Homeland Security Exercise and Evaluation Program (HSEEP) and FEMA Region IX is considering it as a Best Management Practices example for other states to follow.

Tables 5-1 and 5-2 below show details of the current status of hazard plan development and updates in the local jurisdictions, tribal communities, and the state, as well as the dates FEMA approved their plans.

Table 5-1. Current Status of Local Hazard Plan Development and Updates.

State of Nevada - Division of Emergency Management

County Hazard Mitigation Plan Status as of: 2-Jan-2013

	County/City	Type of Plan	Date Approved	Update Due	Comments
1	Carson City	Multi	6-Apr-2011	6-Apr-2016	
2	Churchill	Multi	13-Jun-2012	13-Jun-2017	
3	Clark County	Multi	29-Nov-2012	29-Nov-2017	
4	Douglas County	Single	24-Mar-2008	24-Mar-2013	Plan update in process
5	Elko County	Multi	26-Oct-2008	26-Oct-2013	Plan update in process
6	Esmeralda County	Single	4-Apr-2011	4-Apr-2016	
7	Eureka County	Multi			Plan development in process PDM 2010 Grant
8	Humboldt County	Multi			Planning in Process PDM 2011 Grant
9	Lander County	Multi			Planning in Process PDM 2011 Grant
10	Lincoln County	Multi	1-May-2012	30-Apr-2017	
11	Lyon County	Multi			Plan development in process
12	Mineral County	Single	11-Apr-2012	10-Apr-2017	
13	Nye County	Multi	29-Apr-2006	29-Apr-2011	Plan update in process
14	Pershing County	Multi			Planning in Process PDM 2011 Grant
15	Storey County	Multi	29-Dec-2009	28-Dec-2014	
16	Washoe County	Multi	15-Dec-2010	14-Dec-2015	
	Reno, City of	Multi			
	Sparks, City of	Multi			
17	White Pine County	Multi			Plan in Process PDM 2010 Grant

Table 5-2. Current Status of Nevada Tribal Hazard Plan Development and Updates.

	TRIBAL	Type of Plan	Date Approved	Update Due	Comments
1	Duck Valley Shoshone-Paiute	Single	11-Jul-2011	11-Jul-16	Update approved by Region X
2	Duckwater Shoshone	Multi			Development in conjunction with Nye
3	Ely Shoshone Council				
4	Fallon Paiute-Shoshone				
5	Fort Mojave Indian				
6	Goshute Business Council				
7	Las Vegas Paiute				
8	Lovelock Paiute				
9	Moapa Business Council				

Table 5-2. Current Status of Nevada Tribal Hazard Plan Development and Updates.

	TRIBAL	Type of Plan	Date Approved	Update Due	Comments
10	Pyramid Lake Paiute	Multi	7-Apr-2011	15-Dec-2015	Regional with Washoe Co.
11	Reno-Sparks Indian Colony	Multi	7-Apr-2011	15-Dec-2015	Regional with Washoe Co.
12	Summit Lake Paiute				
13	TeMoak Tribal Council				
14	Battle Mountain Band Council				
15	Elko Band Council	Single	18-Jan-2011	18-Jan-2016	
16	South Fork Bank Council				
17	Wells Band Council				
18	Timbisha Shoshone				
19	Yerington Paiute				
20	Yomba Shoshone				
21	Walker River Paiute				
22	Washoe Tribe of NV & CA	Multi	3-Jun-2009	3-Jun-2014	Update
23	Carson Colony Council				
24	Dresslerville Community Council				
25	Stewart Community Council				
26	Woodfords Community Council				

5.1.1.1 Identification and Notification of Potential Subgrantees (206.437(b)(4)(i))

Potential subgrantees for pre-disaster mitigation funding are identified and notified via the TTX sessions, workshops, social media, FM technical assistance sessions, NHMPC member networking, as well as widely distributed e-mail notices and hard-copy paper flyers.

First, there is a well-established email communication tree network that connects the main "trunk" SHMO with all subsidiary branches of the emergency management network throughout Nevada that reaches all levels of emergency management personnel in state, county, local, and tribal governments. This e-mail network is used to communicate with, identify, and notify potential subgrantees of pre-disaster mitigation funding opportunities. Through this network the initial notification is sent to the following main branches of the emergency management system and all subsidiary networks throughout the state:

- State Floodplain Manager
- Emergency Managers
- NHMPC
- NESC

- Tribal Liaison
- Nevada Association of Counties
- Public Works Directors for local communities
- Homeland Security Distribution list
- Governor's office email list of State agencies
- Current and past subgrantee list
- Community Emergency Response Teams
- Local Emergency Planning Committees
- Nevada Grants Office

In addition to the mass e-mail notification, a paper flyer, found in Appendix Q, is updated annually that describes the Unified Hazard Mitigation Assistance (HMA) programs, eligible activities, and a calendar with scheduled deadlines for the current grant cycle. This flyer is distributed to potential subgrantees through the DEM staff, the floodplain manager, and at the NHMPC meetings statewide. The flyer directs potential subgrantees to the NHMPC website for details on the application process.

In addition, the NHMPC website, the Floodplain Management Website, and the DEM website are updated with current application procedures and notices of intent and relevant forms.

Below is the State Administrative Plan's section pertaining to identification and notification of potential subgrantees for the post-disaster funding, HMGP. It includes the application process for PDM and HMGP as well as the application prioritization criteria used by NHMPC for all hazard mitigation requests under HMA. This process is also used to prioritize FMA and RFC proposals managed by NDWR.

1. IDENTIFICATION:
   a. Upon receipt of a presidential disaster declaration, the SHMO consults with the Federal Hazard Mitigation Officer (FHMO) to identify potential projects. The FHMO, and the FEMA Public Assistance Officer provide the SHMO with early indications of potential projects. The SHMO coordinates with the State Public Assistance and Individual Assistance Officers to determine a preliminary list of Subgrantees. Using the most current disaster assessment information available, the SHMO develops a list of potential Subgrantees. The SHMO considers the use of pre-identified mitigation strategies and potential HMGP projects found in the State and/or Local Multi Hazard Mitigation Plan. Potential projects may also be

identified during the preliminary damage assessment or post-disaster hazard mitigation team process. The SHMO uses these initial consultations to obtain a general estimate of available program funds.

b. The SHMO reviews the existing State Multi Hazard Mitigation Plan (Section 322 of the Stafford Act) for potential applications of Section 404 funding. The SHMO forwards all applications to NHMPC's Proposal Review Subcommittee for review of eligibility and prioritization recommendations. The SHMO obtains additional information necessary to assist the NHMPC in making their determination and notifying Subgrantees of ineligible projects.

c. The NHMPC reviews all pre-disaster and post-disaster projects, and other projects/programs for potential Section 404 and 322 funding.

d. The list of potential Subgrantees will continue to expand as recovery efforts get underway.

2. NOTIFICATION:

a. The SHMO will:

(1) Work with the FHMO to coordinate an announcement of the availability of the Section 404 Program funding during the Public Assistance Applicant Briefing. The FHMO and SHMO will present a detailed overview of the program to potential Subgrantees for assistance under this program. See Annex B for a sample copy of a "Notification Letter" for the Hazard Mitigation Grant Program.

(2) Notify potential applicants of information via public notices, news releases, direct contact and media coverage.

b. The NHMPC's Proposal Review Subcommittee will recommend, to the NHMPC, a selection and prioritization of projects to be submitted to FEMA for approval. The NHMPC approves the final selection and prioritization of projects for submission to FEMA. The SHMO will notify each Subgrantee of the NHMPC's decision. The SHMO submits projects approved by NHMPC to FEMA.

c. The SHMO will notify Subgrantees of projects not selected for submission to FEMA and advise them of the following ***State*** appeal process (206.437 (b)4(ix)):

1) The Subgrantee may appeal a decision made by the NHMPC.

2) The written appeal must be submitted to the NHMPC within 60 days after the receipt of a notice of denial/rejection.

3) The appeal must contain documented justification supporting the Subgrantee's position to warrant reconsideration by the NHMPC.

d. The SHMO will establish a Point of Contact (POC) with all Subgrantees and coordinate technical assistance, project management and overview with the Subgrantee's POC for the duration of the project. The NHMPC, the SHMO, State staff, and the FHMO can generate expertise.

5.1.1.2 Application Procedures (206.437(b)(4)(ii))

1. The SHMO will coordinate with the State Public Assistance and Individual Assistance Officers as well as the FHMO to determine deadlines for the HMGP.
2. The SHMO will have responsibility to ensure the proper completion of all applications prior to submission to the FEMA Regional Director. The State requires submission of an electronic copy and a hard copy of all applications.
3. An interested potential subgrantee must submit a Notice of Interest (NOI) to the SHMO within 60 days of the disaster declaration. The SHMO and/or the PA officer will announce the 60-day deadline at the Public Assistance and/or Mitigation Applicants' Briefings.
4. The SHMO will forward all applications to the NHMPC for review of eligibility in accordance with Section H, Part 1. The SHMO will obtain additional information necessary to assist NHMPC in making their determination and notifying Subgrantees of ineligible projects.
5. In the event that several eligible projects are competing for limited funding, the NHMPC will prioritize the applications. Applications will be submitted to FEMA according to NHMPC's prioritization.
6. The SHMO will prepare the Hazard Mitigation Grant Program application package for submission to FEMA. The Governor's Authorized Representative (GAR) for the HMGP or the Chief of DEM for PDM will forward state application to FEMA based on the NHMPC's recommendation.
7. The SHMO will notify Subgrantees of the NHMPC's decision regarding application approval or disapproval. Requests and project information will be coordinated with the Federal Hazard Mitigation Officer (FHMO).

5.1.2 Funding and Technical Assistance for the Past Three Years

Nevada's SHMO continues to work with local entities to provide funding and technical assistance for local hazard mitigation plans. Technical assistance for local mitigation planning projects has consisted of the following:

a) Providing guidance for organization of resources

b) Mitigation planning presentations for elected officials

c) Putting local entities in contact with appropriate sources of expertise such as the Nevada Bureau of Mines and Geology for earthquake information, and the Division of Water Resources for flood issues

d) Regularly attending local mitigation planning meetings.

Funding for mitigation plans and projects is provided under FEMA mitigation programs through NDEM in close coordination with the Division of Water Resources. All plans developed at the local and State levels are presented to the SHMO for a preliminary review. Jurisdictions are strongly encouraged to present partial sections to the SHMO allowing for

"course corrections" before their final draft submissions. As mentioned before, the SHMO also participates as a State Liaison in key plan development meetings with the jurisdiction whose plan is under development. State funding for development and/or updating of hazard mitigation plans is not available. Local, tribal, and state plans are developed only with funding received through the HMA process. Table 5-3 presents a summary of HMA funding received by counties, regional communities, and the State for plan development and updates during the period since the last state update, 2010-2013.

Table 5-3. HMA Funding for Plans 2010-2013

Year	County/City	Description	Source	Amount ($)
2010	Churchill and Mineral	Development of separate HM plans	PDM	39,375.00
2010	Lincoln County	Update of HM plan	PDM	23,099.00
2010	Nye County	Update of HM plan	PDM	39,001.00
2010	White Pine and Eureka County	Development of Regional HM plan	PDM	39,500.00
2010	State of Nevada	MyPlan Website Development	CTP	100,000.00
2011	Pershing, Lander, and Humboldt	Development of Regional HM plan	PDM	60,006.00
2012	State of Nevada	Community Resilience	CTP	75,000.00
2012	Douglas County	Update of HM plan	PDM	102,258.00
2012	Enhanced SHMP	Update of SHM plan	PDM	399,728.00
Total received during three-year state planning cycle				877,967.00

5.2 LOCAL PLAN INTEGRATION

The requirements for local plan integration, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: COORDINATION OF LOCAL MITIGATION PLANNING

Local Funding and Technical Assistance

Requirement §201.4(c)(4)(ii): The section on the Coordination of Local Mitigation Planning **must** include a description of the State process and timeframe by which the local plans will be reviewed, coordinated, and linked to the State Mitigation Plan.

Requirement §201.4(d): **Plan must be reviewed and revised to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities . . .**

Element

Does the **new or updated** plan provide a description of the **process and timeframe** the State established to **review** local plans?

Does the **new or updated** plan provide a description of the **process and timeframe** the State established to **coordinate and link** local plans the State Mitigation Plan?

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

5.2.1 Process and Timeframe to Review Local Plans

The SHMO or his/her designee requests review of drafts from the communities as the planning process progresses in an effort to provide feedback and guide the plan to meet the federal requirements. While attending local HM planning meetings locally, State HM staff recommends appropriate action to ensure compliance with federal planning requirements. Once a completed draft of the plan is received, mitigation staff reviews the crosswalk and content of the plan document and together with the lead local planner make revisions. In addition to attending local planning meetings when possible, mitigation staff is available to provide planning technical assistance when requested by the community.

Rapid review of local mitigation plans was hindered in early years by understaffing within the DEM mitigation section. A consultant hired in 2009 to assist the SHMO with planning, grant, application and technical assistance tasks greatly increased efficiency and timeliness of the SHMO's ability to fully review all local hazard mitigation plans within 45 days of receipt. From 2009 to 2011, PDM management costs funded this contractor and during 2012, funding from CTP sources was received to continue contractor funding and to provide technical assistance and support to local communities for their annual evaluation through the Table Top Exercise, or to assist in the update process of an expiring HM plan. This assistance is essential to provide the technical support for local hazard mitigation updates and maintenance in the future. However, with the state's budgetary constraints, no additional staffing is foreseen in the future.

5.2.2 Coordinate and Link Local Plans to the State Mitigation Plan

The NHMP Subcommittee is charged with coordinating and linking the local plans to the Nevada HMP. Once a local plan is completed and approved by FEMA Region IX, the plan must wait for review until the next quarterly Subcommittee meeting. The integration process is expected to take 6 months to a year. The following process will be used for linking the local plan to the Nevada HMP.

1. NHMP Subcommittee Meeting (6 months to a year)
2. Local plans are presented to the Subcommittee as new business by SHMO as follows:
    a. Written detailed items found in new local plan, including required analyses, proposed for incorporation into the State Plan (examples of information presented for incorporation are listed below)
        i. Recommended additions to State plan under each identified hazard, noting hazards not identified in the State plan.
        ii. Add capability assessment information
        iii. Add goals, objectives and action (GOAS) items, noting current mitigation activities, funding sources, and link to the State's GOAS.
        iv. Record the completed plan in appropriate State plan locations.
3. The additions are approved, disapproved, or modified by the Subcommittee.

4. Incorporation of new plan data made to the Nevada HMP by the SHMO or designee

Local plans use the state plan to compile information about the communities' hazards, their nature, location, and estimated potential losses. The information for earthquake and flood hazards currently found in the state plan has been used by communities such as Washoe County and Carson City to update their plans. The state in turn uses the local plans to update the data about the communities' capabilities, hazard ratings, and the mitigation strategy.

Since 2007, the integration of local plans with the state plan has really been upside down, with the planning communities using the state plan's information to assist in their risk assessment. This is the primary reason for the NHMPC to work on enhancing the data found in the state plan and making it available in electronic format to Nevada's communities. Much work remains to be done and although priorities exist, these are not always the same for the state as for the communities. As the state is not a source for mitigation funding, support for communities who go above and beyond the norm in mitigation planning and strategy consists basically of written letters of recognition from NHMPC, and the state tracks the activity when notified.

In an effort to better support the integration of local plans with the state plan, the NHMPC has initiated a special project funded by the Regional Office called "MyPlan", implemented by NBMG's GIS staff. This project uses the same format as that created by California's "MyPlan" project, which consists of a website directed to community planners to access hazard risks for each and all communities but populates it with Nevada-specific data. The use of the website as a resource for developing and/or updating hazard mitigation plans with better, more accessible data will make the planning process much easier for locals and for state integration purposes. During the 2010-2013 plan update period, Gary Johnson with NBMG has been accompanying the SHMO on visits to LHMP meetings and giving presentations to those groups in order to familiarize planners with MyPlan and its capabilities in the planning process and to solicit input of additional local hazard data sets into the system.

5.3 PRIORITIZING LOCAL ASSISTANCE

The requirements for prioritizing local assistance, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: COORDINATION OF LOCAL MITIGATION PLANNING

Local Funding and Technical Assistance

Requirement §201.4(c)(4)(ii): The section on the Coordination of Local Mitigation Planning **must** include criteria for prioritizing communities and local jurisdictions that would receiving planning and project grants under available funding programs, which **should** include consideration for communities with the highest risks, repetitive loss properties, and most intense development pressures.

Further, that for non-planning grants, a principal criterion for prioritizing grants **shall** be the extent to which benefits are maximized according to a cost benefit review of proposed projects and their associated costs.

Requirement §201.4(d): **Plan must be reviewed and revised to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities . . .**

Element

Does the **new or updated** plan provide a description of the criteria for prioritizing those communities and local jurisdictions that would receive planning and project grants under available mitigation funding programs?

For the **new or updated plan, do** the prioritization criteria include, for non-planning grants, the consideration of the extent to which benefits are maximized according to a cost benefit review of proposed projects and their associated cost?

For the **new or updated plan, do** the criteria include considerations for communities with the highest risk?

For the **new or updated plan, do** the criteria include considerations for repetitive loss properties?

For the **new or updated plan, do** the criteria include considerations for communities with the most intense development pressures?

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

5.3.1 Local Funding and Technical Assistance

5.3.1.1 Planning, Review, Ranking, and Selection

The guidelines used by the NHMPC to review, rank, and select projects for HMA are set forth in Section 8. Please refer to Section 8.2.3 and Figure 8-2 for these guidelines on the review, ranking and selection of projects for HMA.

5.3.1.2 Prioritization Evaluation

Application Prioritization criteria used by the NHMPC prioritize projects for HMA funding are set forth in Section 8. Please refer to Section 8.2.3 and Figure 8-2 for these Prioritization criteria

5.3.1.3 Prioritization Form

The Mitigation Grant Prioritization Form used by the NHMPC is shown in Section 8, Figure 8-2 and below.

NHMPC Prioritization Form

Subgrantee: _____ **Activity Name:** _____

Ranking and Selection of Applications:

Application Prioritization Criteria (I-3)	**Assigned Value (0 - 10)**
a. Population Affected	
b. Public Perception of Need	
c. Emergency Access and Public Inconvenience *For **planning** applications:* *Performance of current plan maintenance activities & Implementation of mitigation activities.*	
d. Cost Effectiveness of the Project (BCA=1) (10 pts) *For **planning** applications: (15 pts)* *Understanding of the planning process and a methodology for completing the proposed mitigation plan.*	
e. Availability of Other Funding Sources	
f. Timing and Implementation	
g. Environmental Enhancement (10 pts) *For **planning** applications: (0 pts)*	
h. Resilience, Maintenance & Sustainability of Project (10 pts) *For **planning** applications: (15 pts)* *The description of unique or innovative outreach activities*	
Subtotal Prioritization Criteria (I-3, a thru h)	
Subtotal Criteria - (80-Point Maximum)/2 =	

(Max. 40 points)

Additional Prioritization Considerations (I-4)

a. Consistent with State & Local Mitigation Plan	
b. Detrimental Impact if Not Taken	
c. Greatest Impact to Reduce Future Disaster Losses	
d. Mitigate Multiple Hazards and/or Accomplish Multiple Objectives	
e. Optimize Total Funds Available	
f. Local Level of Interest & Degree of Commitment to Project	
Additional Considerations Combined (I-4, a thru f)	

(Max. 60 points)

Total Criteria + Considerations _____

(Max. 100 points)

Figure 5-2. NHMPC Application Prioritization Form

5.3.2 Cost Benefit Review of Proposed Projects

Section 8.2.1, Figure 8-2 subsection 3.d, Application Prioritization, letter d. states the consideration of the cost benefit review criteria.

5.3.3 Highest Risk Communities

Section 8, Figure 8-2 subsection 4 lists a series of considerations taken by the committee regarding highest risk communities.

5.3.4 Repetitive Loss Properties

Section 8, Figure 8-2 subsection 4, letter i lists a series of considerations taken by the committee regarding repetitive loss properties.

5.3.5 Intense Development Communities

Population affected is the first criterion used for prioritization of mitigation funding proposals. According to the U.S. Census Bureau, between April 2010 and July 2012, four Nevada counties saw population growth of 2.5% or more: Clark-2.5%, Lander–2.9%, Humboldt - 3.1%, and Elko-4.9%. Four counties had very low to no growth and 8 actually lost population during the same time period. However, Clark and Washoe Counties still contain the greatest percentage of Nevada's population and thus the greatest number of people at risk from flood, wildfire, and earthquake.

During the last three-year period, funded proposals for planning included one from Churchill County; a regional plan from Pershing, Lander, and Humboldt; and a second regional from White Pine and Eureka. Clark, Nye, Douglas counties received grants to update their currently approved plans. Storey, and Elko counties are updating their plans with funding from Cooperating Technical Partners grant program.

Washoe, Douglas, Clark, and Storey counties and the cities of Reno and Henderson continue to take advantage of available funding sources. All have projects eligible for future HMA funding that include embankment protection, fuels reduction, demolition of flood-prone buildings, culvert enhancement and infrastructure protection. NHMPC members discuss and evaluate the criteria for the prioritization process every time applications are submitted to the state. To date, the primary challenge has been to submit applications that are competitive nationally.

As for successes in coordination of Local Mitigation Plans, data in Table 5-1 reveal that Nevada now has 11 counties with approved local county hazard mitigation plans in 2013, as compared to only 5 counties with approved local county hazard mitigation plans in 2007 and 8 in 2010. All remaining 6 counties are in the process of developing county hazard mitigation plans – either in preparation or pending approval by FEMA.

Development of Local Mitigation Plans among Nevada's 26 independent tribal entities has presented a challenge to coordination. In 2007, Nevada had only one tribal entity with an approved hazard mitigation plan, 3 in 2010, and in 2013 we have 5 approved tribal hazard mitigation plans. The State, through its tribal liaison member on the NHM Planning

Subcommittee and the Intertribal Emergency Response Committee provides an avenue for tribal participation in mitigation planning. The SHMO makes regular visits throughout the year to various tribal communities with mitigation outreach flyers, funding information, planning tools, and technical expertise.

This section provides the State of Nevada's schedule for monitoring, evaluating, and updating the Nevada HMP; including reviewing progress on goals and actions in the mitigation strategy.

No significant changes were made to this Section other than updates to the data referenced and pertinent Section number changes.

6.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

The requirements for monitoring, evaluating, and updating the plan, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: PLAN MAINTENANCE PROCESS

Monitoring, Evaluating, and Updating the Plan

Requirement §201.4(c)(5)(i): The Standard State Plan Maintenance Process **must** include an established method and schedule for monitoring, evaluating, and updating the plan.

Element

Does the **new or updated** plan describe the method and schedule for monitoring the plan? (e.g., identifies the party responsible for **monitoring,** includes schedule for reports, site visits, phone calls, and/or meetings)

Does the **new or updated** plan describe the method and schedule for **evaluating** the plan? (e.g., identifies the party responsible for evaluating the plan, includes the criteria used to evaluate the plan)

Does the **new and updated** plan describe the method and schedule for **updating** the plan?

Does the updated plan include an analysis of whether the previously approved plan's method and schedule worked, and what elements or processes, if any, were changed?

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

6.1.1 Schedule for Monitoring, Evaluating and Updating the Plan

To ensure that the goals and objectives for Nevada are current and that local mitigation efforts are accomplished, the Subcommittee periodically monitors the Nevada HMP.

The Subcommittee monitors the Nevada HMP quarterly or as situations dictate, such as after a disaster declaration or when new information is obtained. The Subcommittee Chair in coordination with the SHMO or his/her designee is responsible for updating the Nevada HMP in the second quarter of the year. A record of updates is maintained in the minutes of the Subcommittee meetings. When an evaluation of the plan determines it is necessary, the update process will begin immediately.

6.1.2 Method for Monitoring the Plan

The process to initiate and complete the modification of the Nevada HMP has five basic steps listed below.

1. The Chair of the NHMP Subcommittee receives a quarterly report on the status of the Nevada HMP's goals, objectives, action items, and the status of identified hazards.
2. The report evaluates whether the Nevada HMP's current mitigation hazards, goals, objectives, and action items are appropriate and/or effective.
3. The report recommends any needed changes and/or amendments to the Nevada HMP. Any proposed changes are discussed in open forum at the quarterly meetings by Subcommittee members.
4. If the NHMP Subcommittee determines to modify the Nevada HMP, the NHMP Subcommittee can initiate a modification by a majority vote at a quarterly meeting followed by an agenda item at the next quarterly meeting following the administrative requirements of the state's open meeting law.
5. SHMO or his/her designee records any reviews and updates in formal meeting minutes.

6.1.3 Method for Evaluating the Plan

This methodology did not change during the 2013 update process. The evaluation was accomplished by reviewing each and every section of the 2010 plan and each question listed below was asked as the appropriate section was reviewed by the Subcommittee. Please note the addition of questions 1c and 1d to encompass the hazard profiling and ranking activities.

The Subcommittee Chair incorporates the following process into the quarterly meetings:

1. Risk Assessment Evaluation
    a. Incorporate new and/or updated local mitigation plan risk assessment information.
    b. Have the risks changed at a state level?
    c. Are there new hazards at the local or state level?
    d. Has the current ranking of the hazards changed?
2. Goals Evaluation
    a. Are the goals appropriate for what the State wants to accomplish?
    b. Do the goals reflect what the local jurisdictions want to accomplish?
    c. Do the State's and local jurisdictions' goals and actions complement each other?
    d. Do the goals satisfy the Federal criteria (i.e., the crosswalk)?
    e. Do the goals reflect the local jurisdictions' plans and concerns?
    f. Are the goals feasible given the funding sources available to state, and local jurisdictions?

3. Modify goals in accordance with the results of the evaluation.
4. Action/Project Evaluation
    a. What action items have been accomplished?
    b. Are the action items appropriate to accomplish the plan's goals and objectives?
    c. Do any of the action items need to be changed?
    d. Do new action items need to be added?
5. Does the Nevada HMP meet federal criteria?
    a. Using current FEMA "Review Tool," review the plan for appropriate content.

6.1.4 Method for Updating the Plan

Once the Nevada HMP is monitored and evaluated, it must be updated to stay current with hazards, mitigation goals, objectives, and activities. The process for updating the plan is in the following list of actions:

1. The Subcommittee Chair, SHMO, or his/her designee submits changes to the Subcommittee. (A NHMPC member can also submit changes to the Nevada HMP).
2. The Subcommittee reviews and recommends (or rejects) the changes, then sends the changes to the NHMPC.
3. The NHMPC approves/rejects the Nevada HMP's changes.
4. SHMO or his/her designee updates the Nevada HMP with approved changes.
5. The changes are recorded in the meeting minutes which become part of the plan in the form of Appendix D.
6. The process is completed within 90 days.
7. Update the record of adoption if necessary.

As mentioned before, the update of the SHMP is continuous in Nevada. After FEMA approval in October, the next Subcommittee meeting in January marks the beginning of the update process through the monitoring, evaluating, data compilation, and updating of the plan document.

6.1.5 Previous Process and Recommended Changes

No major changes to the previous process for monitoring and updating of the plan were made in this iteration. The Subcommittee used the Annual Questionnaire form at its quarterly meeting as a guide to gather data and solicit input from the members. The Completed Mitigation Activity Report Form (Figure 6-3) was distributed to all members via e-mail and in hard copy at the quarterly meetings. The information collected in these reports is found in Appendix P. Additionally the Planning Team developed a form that assisted in gathering the information about public awareness and outreach efforts by

members of the NHMP Subcommittee. These efforts include but are not limited to civil and professional organizations with content about hazard mitigation planning or project activities. These data are summarized in section 2.2.2, Participation of Interested Groups in the Planning Process.

As events occur in the State, the Subcommittee will continue to learn from them and adjust both the process and the plan to address any deficiencies highlighted by these occurrences.

The periodic monitoring of the plan and process takes place through quarterly meetings of the Subcommittee. Below is a possible list of general agenda items for discussion and/or action at the established quarterly meetings of the Subcommittee, which are scheduled the last Monday of the first month of each quarter at 1:30 pm.

1. Risk assessment review involving both the state and local level:
    a. Local level
        i. New plans
        ii. Updated plans
2. Ongoing studies
3. Addition of action items to address risk
4. Modification of action items
5. Deletion of action items completed or no longer applicable
6. Grant application, funding sources
7. Training and workshops

This information will be reported to the NHMPC by the Subcommittee Chair at its quarterly meetings.

PLAN SECTION	QUESTIONS	YES	NO	COMMENTS
PLANNING PROCESS	Are there internal or external organizations and agencies that have been invaluable to the planning process or to mitigation action?			
	Are there procedures (e.g., meeting announcement, plan updates) that can be done more efficiently?			
	Has the Steering committee undertaken any public outreach activities regarding the HMP or implementation of mitigation actions?			
HAZARD PROFILES	Has a natural and/or human-caused disaster occurred in this reporting period?			
	Are there natural and/or human-caused hazards that have not been addressed in this HMP that should be?			
	Are additional maps or new hazards studies available? If so, what have they revealed?			
VULNERABILITY ANALYSIS	Do any new critical facilities or infrastructure need to be added to the asset lists?			
	Have there been changes in development patterns that could influence the effects of hazards or create additional risks?			
MITIGATION STRATEGY	Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning?			
	Are the goals still applicable?			
	Should new mitigation actions be added to a community's Mitigation Action Plan?			
	Do existing mitigation actions listed in a community's Mitigation Action Plan need to be reprioritized?			
	Are the mitigation actions listed in a community's Mitigation Action Plan appropriate for available resources?			

Figure 6-1. Annual Review Questionnaire

6.2 MONITORING PROGRESS OF MITIGATION ACTIVITIES

The requirements for monitoring the progress of mitigation activities, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: PLAN MAINTENANCE PROCESS

Monitoring Progress of Mitigation Activities

Requirement §201.4(c)(5)(ii): The Standard State Plan Maintenance Process **must** include a system for monitoring implementation of mitigation measures and project closeouts.

Requirement §201.4(c)(5)(iii): The Standard State Plan Maintenance Process **must** include a system for reviewing progress on achieving goals as well as activities and projects in the Mitigation Strategy.

Element

Does the **new or updated** plan describe how mitigation measures and project closeouts will be monitored?

Does the **new or updated** plan identify a system for reviewing progress on achieving goals in the Mitigation Strategy?

Does the updated plan describe any modification, if any, to the system identified in the previously approved plan to track the initiation, status, and completion of mitigations activities?

Does the **new and updated** plan identify a system for reviewing progress on implementing activities and projects of the Mitigation Strategy?

Does the updated plan discuss if mitigation actions were implemented as planned?

Source: FEMA, Standard State Hazard Mitigation Plan Review Crosswalk 2008

6.2.1 Monitor Progress of Mitigation Activities

The SHMO or his/her designee will track, monitor and provide oversight for approved projects under FEMA's Hazard Mitigation Assistance (HMA) programs. The tracking of projects includes a comparison against the mitigation goals, objectives, and actions from Nevada HMP Section 4. The comparison allows the SHMO to verify that Nevada is meeting the goals and objectives set in the updated Nevada HMP as well as the effectiveness of the mitigation program.

For HMA funding, the tracking of projects begins when the SHMO reviews initial project applications for completeness and eligibility. At this time, the SHMO also compares the project with the Nevada HMP Section Four to determine whether the project is in agreement with the goals, objectives, and actions established in the mitigation strategy. The SHMO maintains records of the applicable action, goal and objective by funding source, year, and hazard. The resulting information is shown in figures and tables found in Section 4.2.4 as Hazard Management Capability changes. This report is presented to the Nevada HMPC at its quarterly meetings. The form shown here in Figure 6-3 is used by DEM to assist in tracking mitigation actions in Nevada. Data collected from these forms is incorporated into this plan in Appendix P, Completed Mitigation Activities.

After the project closeout, the SHMO will work with the Subcommittee and Committee to re-evaluate two items: one; the mitigation strategy to determine the progress made and, two; if modifications are necessary. The SHMO maintains a record of any modifications to the mitigation strategy in the minutes of the NHMPC and Subcommittee meetings. This record is used to create the report for the Subcommittee's review at their subsequent meeting.

It is our intent to compile data about the State's accomplishments in the mitigation field. These data are provided by the representatives of the lead agencies participating in the Subcommittee, the NHMPC and/or the annual survey described in section 6.2 as well as through the annual Tabletop Exercise (TTX) at local meetings attended by the Hazard Mitigation staff and the incorporation of after-action reports from the TTX.

6.2.2 Project Closeouts

The process described in 2010 remains essentially the same; the only change was the form presented.

1. Subgrantees mark final report accordingly
2. NDEM confirms payment of all reimbursements
3. NDEM requests closure of award to FEMA; closing request includes package with
    a. Expend
    b. Deobligations
    c. Final site visit with photos if applicable
    d. Confirmation that project is complete

When the SHMO determines that all project management procedures have been satisfied, the original signed Final Quarterly Report Form will be filed with the project file. A copy of the form will be forwarded to FEMA with a formal letter, officially requesting closure of the project. Nevada successfully closed HMGP and PDM projects during the update of this plan following the procedure above.

6.2.3 Review Progress on Mitigation Strategy

The SHMO or his/her designee tracks mitigation objectives, goals, or action items implemented with the Unified Hazard Mitigation Assistance programs. To obtain data about activities implemented by local, tribal, other state and private entities with different sources of funding, the form shown in Figure 6-3: Completed Mitigation Activity/Project Report is distributed quarterly to the current tree network of contacts described in Section 5.1.1.1. The information serves as a means for the SHMO to measure progress and capability of the group performing the mitigation activity in the implementation of the mitigation strategy at the community level.

6.2.4 Modifications in Tracking Mitigation Actions

No modification was made to this process during the 2013 plan update. Figure 6-3 is a valid and useful form that provides the SHMO a standardized format to track state agencies and local jurisdictions' objectives, goals, and actions as well as track their progress and accomplishments. The SHMO compiles data and compares the activities to the goals and objectives. This data is presented to the Subcommittee and NHMPC at their regularly scheduled meetings.

6.2.5 Reviewing Progress on Implementing Activities and Projects

The document shown in Figure 6-2 is an example of a quarterly financial and progress report used in the system for reviewing the progress of activities and projects of the Nevada HMP programs managed by NDEM. This form is updated on a quarterly basis by the subgrantees and sent to the SHMO for review. The SHMO reports this information to the NHMPC at its quarterly meeting. The NHMPC discusses the information and formulates recommendations to modify the Nevada HMP accordingly.

All activities requesting funds from HMA programs require NHMPC's input in the prioritization process before submission to FEMA. Beginning in 2012, NDWR and NDEM agreed to have all HMA applications managed by NDEM.

Nevada Department of Public Safety
Division of Emergency Management

QUARTERLY FINANCIAL AND PROGRESS REPORT

Reporting Period:	Quarter STARTING month, day & year	Quarter ENDING month, day & year
	January 1, 2010	March 31, 2010

DESCRIPTION

Subgrantee Agency:	Esmeralda, Emergency Management			Report No. :	Nine (9)
Address:	Box 57, Goldfield, NV 89013			Funding Year:	2007
Project Name:	2007 PDMC-002, HM Plan			Grant Fund Stream:	PDM
Project Manager:	*Harriet Ealey*	Fiscal Agent:		Funding Job #:	97017E7
E-mail:	harrietealey@frontiernet.net	E-mail:		Fed Funds Share %:	75%
Phone:	775-485-9974	Phone:		Match Funds Share %:	25%

TO-DATE CUMULATIVE TOTALS

			DEM Use Only
A. Total Expenses Previously Claimed	$	24,086.19	
B. Total Expenses Claimed This Period	$	-	Budget Account:
C. Total Expenses Claimed To Date (*Lines A+B*)	$	24,086.19	Category:
D. Total Match provided by Sub-grantee To-date (*If applicable*)	$	6,021.55	General Ledger:
F. Total Expenses Reimbursed To Date (*Total Fed Funds Requested this QTR+Prev*)	$	18,064.64	Amount Reimbursed:
G. Encumbered	$	-	Voucher #:
H. Total Federal Grant Funds Awarded	$	24,949.50	Initials:
I. Unobligated Balance of Federal Funds (Lines H - (G+F))	$	6,884.86	Date:

BUDGET, EXPENDITURES & COMMITMENTS BY CATEGORY

Category	Grant Funds Awarded (H)	Previously Claimed To Date (A)	Claimed This Period (B)		Total Claimed To Date (C)	Encumbered (G)
Personnel				=	$ -	$ -
Consultants/Contracts	$ 33,266.00	$ 24,086.19	$ -	=	$ 24,086.19	$ -
Travel		$ -	$ -	=	$ -	$ -
Supplies/Operating		$ -	$ -	=	$ -	$ -
Equipment		$ -	$ -	=	$ -	$ -
Training		$ -	$ -	=	$ -	$ -
Planning		$ -	$ -	=	$ -	$ -
M&A		$ -	$ -	=	$ -	$ -
COLUMN TOTALS	$ 33,266.00	$ 24,086.19	$ -	=	$ 24,086.19	$ -

Total Federal Funds Requested this Claim: (*Current Period Total Less Match*):	$	-

PROJECT REPORTING

Do you anticipate completion of work within the performance period.	Yes
If not, please describe any problems, delays or adverse conditions that will impair the ability to meet the stated objectives in the application.	
Do you anticipate: Cost underrun/overrun?	No
Do you anticipate: Request for extension of performance period?	No

DEM-EMPG-09.00 1 of 2

Figure 6-2. Sample Quarterly Financial & Progress Report

Nevada Department of Public Safety
Division of Emergency Management

QUARTERLY FINANCIAL AND PROGRESS REPORT

Reporting Period:	Quarter STARTING month, day & year	Quarter ENDING month, day & year
	January 1, 2010	March 31, 2010

DESCRIPTION

Subgrantee Agency:	Esmeralda, Emergency Management			Report No. :	Nine (9)
Address:	Box 57, Goldfield, NV 89013			Funding Year:	2007
Project Name:	2007 PDMC-002, HM Plan			Grant Fund Stream:	PDM
Project Manager:	*Harriet Ealey*	Fiscal Agent:		Funding Job #:	97017E7
E-mail:	harrietealey@frontiernet.net	E-mail:		Fed Funds Share %:	75%
Phone:	775-485-9974	Phone:		Match Funds Share %:	25%

PROJECT COMPLETION (Note: The Tasks as identified and tracked here come from the Porject Plan)

Task #	Task Description	% Completion of Task	% Total Completion
1		100%	
2		100%	
3		100%	
4		90%	
5			
6			
7			98%
8			
9			
10			
11			
12			
	Total Actual Project Completion To Date:	98%	

Please describe significant activities and developments that have occurred that show performance during this quarter, including a comparison of actual accomplishments to the tasks listed above.

Task #1	Project Initiation - Complete
Task #2	Risk Assessment - Completed
Task #3	Mitigation Strategy - Completed
Task #4	Prepare Plan-Submitted draft plan to County and Elizabeth Ashby for review. The draft will be amended to relect the comments or changes received and submitted to FEMA.
Task #5	
Task #6	
Task #7	
Task #8	
Task #9	
Task #10	
Task #11	
Task #12	

Attached are copies of all expenses to substantiate the expenses requested on this claim. I certify that submitted invoices have been paid prior to the request for reimbursement from the SAA and to the best of my knowledge and belief, this report is correct and complete and that all outlays and unpaid obligations are for the purposes set forth under the terms of federal and state assurances, program regulations and the approved grant budget. I further certify that a copy of this Financial Report has been provided to the above named Project Manager.

Harriet Ealey — 4/13/2010

Signature - Fiscal Agent — Date

I certify that to the best of my knowledge and belief, this report is correct and complete and that all pertinent facts regarding the status of this Project are included. I further certify that I have provided a copy of this report to the above named Fiscal Agent.

Harriet Ealey — 4/13/2010

Signature - Project Manager — Date

NOTE: Back-up for this claim can be found in the grant program file located at the Division of Emergency Management.

DEM-EMPG-09.00 2 of 2

Figure 6-2. (cont.) Sample Quarterly Financial & Progress Report

As mentioned previously in Section 6.1.4, other programs will be monitored by Subcommittee members. The SHMO will place an action item in the Subcommittee's agenda requesting information about accomplished mitigation projects supported, facilitated and/or funded through/by other state agencies.

Each member reports on the current status of and progress made on any mitigation-related activities or projects within the agency he or she represents and files a "Completed Mitigation Activity/Project Report" (shown in Figure 6-3), with the Planning Team upon completion of any of these mitigation-related activities or projects. These forms are distributed at the same time as the Annual Review Questionnaire to both NHMPC and Subcommittee members and any completed forms are requested to be turned in at each quarterly meeting for reporting purposes. This form was presented to the Subcommittee or NHMPC during the current plan update. The Planning Team compiles all completed mitigation-related activities and projects submitted by committee members into one document presented as Appendix P.

QUARTER :Jan, Feb Mar 2013 **Date Submitted:** _____ **Activity/Project**	**Agency and Amount ($)**		**Effect on Loss Reduction**	**Goal, Action # achieved from State Plan** (See Table 4-2 for Mitigation Goals and Strategic Actions)
	State – Manage, support, Fund ($)	**Federal ($)**		
Sample: Silver Spring drainage pipe enhancement at Highways 50 and 95	DEM Manage	FEMA $53,340	Flood	Action 6.E.2
Complete applicable areas. If unknown, write N/A. Any questions call SHMO Elizabeth Ashby at 775-687-0314				

Figure 6-3. Completed Mitigation Activity/Project Report

The staff reviews each updated section of the plan before the next quarterly Subcommittee meeting and helps to develop future strategic mitigation actions based on those developed in the State or local plans or in supporting agency goals and objectives, or discussed at meetings to include for consideration in the new iteration.

Mitigation actions were implemented as planned during the 3-year update cycle; see Section 4.1.1, Goal Assessment and 4.2.4 Hazard Management Capabilities Changes for details.

Nevada closed disaster funding for hazard mitigation from HMGP-1540 and 1583 and is currently working on closing PDM-2007 award.

The Nevada Enhanced HMP references the following plans and documents:

7.1 REFERENCES

7.1.1 State Documents

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7.1.2 Local Jurisdiction Documents

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- Clark County Regional Flood Control District website: http://www.ccrfcd.org/

- Clark County Regional Flood Control District and website documents major flooding between 1997 and present: http://www.ccrfcd.org/

- Clark County Regional Flood Control District data, earlier: http://gustfront.ccrfcd.org/FileLibrary2/FileLibrary.aspx

- FEMA definitions: http://edocket.access.gpo.gov/cfr_2008/octqtr/pdf/44cfr59.1.pdf

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- *Flood Chronology of the Carson River Basin, California and Nevada*, *Nevada* was developed jointly by Nevada's Floodplain Management Program of the Nevada Division of Water Resources (NDWR) and the U.S. Geological Survey (USGS) within the U.S. Department of the Interior, with the support of the Federal

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Pre-1900: http://water.nv.gov/mapping/chronologies/humboldt/hrc-pt2.pdf

1900-2000: http://water.nv.gov/mapping/chronologies/humboldt/hrc-pt3.pdf

- Nevada Bureau of Mines and Geology Special Publication 34, "Weather and Climate of the Reno-Carson City-Lake Tahoe Region," published in 2007, documents both major historical floods along rivers in western Nevada., as well as significant flash floods, related landslides, and debris flows that have occurred in the Reno-Carson City-Lake Tahoe Region.

- Nevada Bureau of Mines and Geology (NBMG) Special Publication 23 (published in 1998) describes the effects of the 1997 New Year's floods in western Nevada on the Carson, Truckee, and Walker Rivers, and includes a section on previous flood history.

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- U.S. Soil Conservation Special Report entitled *History of flooding, Clark County, Nevada 1905-1975.,* This report documents 184 different flooding events that resulted in damage to private property and public facilities. Since 1960, the area has experienced at least 11 floods costing more than a million dollars each. In that same period, 31 lives were lost in 21 separate flash flood events.

http://gustfront.ccrfcd.org/pdf_arch1/Flood%20Event%20Reports/History%20of%20Flooding.pdf

- U.S. Geological Survey 1963b, *USGS Chronology of the Humboldt River.*

7.2 OTHER IMPORTANT LINKS

- Department of Geological Sciences and Engineering http://www.unr.edu/geology
- Earth Science News and Maps http://geology.com/
- Living with Earthquakes in NV http://www.seismo.unr.edu/Files/Preparedness/nvguide_2010.pdf
- Living with Fire http://www.livingwithfire.info/
- National Oceanic & Atmospheric Administration www.noaa.gov
- Nevada Dam Safety http://water.nv.gov/Engineering/Dams/Safety/damsafety.htm
- Nevada Division of Emergency Management http://dem.nv.gov/
- Nevada Earthquake Safety Council http://www.nbmg.unr.edu/nesc/index.html
- Nevada Fire Safe Council http://www.nvfsc.org/
- Nevada Hazard Mitigation Planning Committee http://www.nbmg.unr.edu/nhmpc/nhmpc.htm
- Nevada Quick Facts from the US Census Bureau http://quickfacts.census.gov/qfd/states/32000.html
- Nevada Seismological Laboratory http://www.seismo.unr.edu/
- Plan Ahead Nevada http://dps.nv.gov/uploadedFiles/dpsnvgov/content/Citizen/evacuationguide_PAN.pdf
- Southern Nevada Health District http://www.southernnevadahealthdistrict.org/
- Tahoe Research, Scholarship & Outreach http://www.tahoe.unr.edu/
- USGS Nevada Aquifer Basics http://capp.water.usgs.gov/aquiferBasics/ext_snvrock.html
- Washoe County District Health Department http://www.washoecounty.us/health/

- Western Great Basin Coordination Center http://gacc.nifc.gov/wgbc/

This section demonstrates the extent to which this plan is integrated with other State and regional programs as well as with FEMA programs and initiatives. It describes current mitigation program management capabilities and discusses how mitigation efforts can be better integrated with those programs via legislative, policy, institutional, substantive, functional, and financial perspectives. Included is an analysis of mitigation actions and effective use of funds and a system and strategy for monitoring the effectiveness of mitigation efforts and updating the SHMP in the future. It also addresses FEMA criteria for qualifying the 2013 plan as an enhanced plan. *Updates to this section include the revision to reflect the management of all HMA grants by NDEM, updates in the HMA review, ranking and review process due to NHMPC streamlining, NDEM modified terminology for the damage assessment teams. Of note, is the escalation of local and tribal planning activities due to increased awareness during the local planning process. This results in continued implementation of plans.*

8.1 INTEGRATION WITH OTHER PLANNING INITIATIVES

The requirements for the enhanced plan, as stipulated in the DMA 2000, and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: PLAN MAINTENANCE PROCESS

Integration with Other Planning Initiatives

Requirement §201.5(b)(1): [An Enhanced Plan must demonstrate] that the plan is integrated to the extent practicable with other State and/or regional planning initiatives (comprehensive, growth management, economic development, capital improvement, land development, and/or emergency management plans) and FEMA mitigation programs and initiatives that provide guidance to State and regional agencies.

Element

Does the **new or updated** Enhanced Plan demonstrate how it is integrated to the extent practicable with other State and regional planning initiatives (comprehensive, growth management, economic development, capital improvement, land development, and/or emergency management plans)?

Does the **new or updated** Enhanced Plan demonstrate how it has been integrated to the extent practicable with FEMA mitigation programs and initiatives that provide guidance to State and regional agencies?

Source: FEMA, Enhanced State Hazard Mitigation Plan Review Crosswalk 2007

8.1.1 Integration with Other Planning Initiatives

Sections 2.1.2 and 2.1.3 of the 2013 SHMP provide a legal, institutional, and policy framework that allows the State to readily integrate advances in hazard mitigation practice in Nevada and provide a framework for the local and tribal communities to do the same. Tables 2-1 and 2-2 of Section 2 identify emergency management and hazard mitigation responsibilities of over thirteen different state agencies, one tribal agency and two local agencies who are involved in the Nevada Hazard Mitigation Planning Committee. Table 2-7 in Section 2.3.1 provides a detailed listing of the integration of the State plan with more than 15 other major state hazard planning efforts, most of which bear on the highest ranked natural hazards in the State – earthquake, flood, and wildfire. Through the efforts of the NHMPC members, other stakeholders

are, at minimum, made aware of the state hazard mitigation planning process and vice versa; members bring to the table the policies and plans developed by other entities outside of state government. One example of this is the participation of some NHMPC members in the Nevada Earthquake Safety Council which in turn works closely with the Western States Seismic Policy Council. Their policies are discussed at length at the NESC meetings and presented at the NHMPC meetings for consideration at the state level through common membership. These policies provide guidance in the earthquake mitigation strategy for the state. A sample of these policies can be found in Appendix O.

A second example is the participation of the Nevada Division of Forestry (NDF) on the NHMPC. NDF staff provide assistance in the development of local and tribal hazard mitigation and contribute to the State plan in the areas of risk assessment, history, and development of goals and objectives for wildfire hazard. NDF also works closely with federal agencies who manage much of Nevada's land when planning wildfire mitigation strategies. The wildfire strategies found in the state plan are based on the regional 10-Year Comprehensive Strategy Implementation Plan developed by the Western States Governor's Association, updated in 2006, which can be found at the following website: http://www.fs.fed.us/news/2006/releases/12/10-year-strategy-december-2006.pdf

Another example is the partnership with Division of Water Resources in RiskMap resilience activities in coordinating meetings with communities to discuss the risks of flood with customized portfolios showing potential flash flooding locations.

Local planning efforts, such as the Truckee River Flood Management Authority's Living River Plan, which can be found at http://truckeeflood.us/55/living_river_plan.html , are integrated into the Washoe County's Regional Hazard Mitigation plan. Both plans address activities to mitigate flooding in all communities situated along the Truckee River. The County's plan is integrated into the state plan. Additionally, the Carson Water Subconservancy District (CWSD) works closely with local, state and tribal agencies to preserve the Carson River watershed and reduce flooding using a regional approach. The CWSD developed a plan for the watershed drafted in conjunction with mutual members of the NHMPC and CWSD.

8.1.2 Integration with FEMA Programs

Table 2-7 lists FEMA mitigation programs and initiatives, the pertinent hazards, a brief statement of the mechanism for integration of the Nevada State plan and local plans with the FEMA program. The pertinent goals and strategic actions are fully outlined in Table 4-2.

Additional efforts to integrate hazard mitigation planning with different planning mechanisms at the local level are demonstrated by NHMPC holding its meetings in rural communities and bringing awareness of risks and activities that enhance the resiliency of each individual community visited. It is also notable that the NHMPC membership includes a representative whose responsibility is implementing one or more of the FEMA mitigation programs. As the Subcommittee expands to include more stakeholders in the process of updating the state plan, so grows its integration with other planning mechanisms and the FEMA mitigation programs.

These stakeholders in turn bring to the planning process their vast network of working relationships with other local, tribal, state and federal agencies that promote integration of mitigation plans and FEMA's programs. During this update process the Subcommittee acquired new representatives from the Washoe Tribes, Nevada Division of Insurance, Nevada State Hospital Association, Safety Specialist Consultants, Nevada Threat Assessment Center, and the State Public Works Board. The resulting plan is used as a guide by other agencies and communities in Nevada in the development of their mitigation strategies and plans. The Nevada Bureau of Mines and Geology is assisting in the development of a web-based, all-hazard risk assessment guide called MyPlan that will greatly enhance our ability to provide aid to the counties and other entities.

In coordination with the FEMA RiskMap program, mitigation staff developed a new program integration activities by partnering with the Floodplain Manager and Division of Water Resources to implement Table Top Exercises for the review and evaluation of currently approved hazard mitigation plans.

Table 4-3 in Section 4.2.1 presents the state's capability to mitigate the hazards described in Section 3 and demonstrates pre-and post-disaster hazard management policies, programs, and capabilities. It also presents the state's funding capabilities for hazard mitigation projects - whether it can support, facilitate, or fund such projects. Support implies that the state manages federally-funded programs. The state facilitates mitigation programs by providing technical assistance to local, tribal, and other entities. The last column provides details of each listed program or agency and its policies and capabilities to mitigate hazards in the state. Even a brief perusal of this chart reveals that there are dozens of available programs, mostly at the federal level, which the State of Nevada and locals are eligible to apply for to support and facilitate hazard mitigation projects for all types of hazards in the state.

8.2 PROJECT IMPLEMENTATION CAPABILITY

DMA 2000 REQUIREMENTS: PLAN MAINTENANCE PROCESS

Project Implementation capability

Requirement §201.5(b)(2)(i): [An Enhanced Plan must document] the State's project implementation capability, identifying and demonstrating the ability to implement the plan, including:

- established eligibility criteria for multi-hazard mitigation measures.
- A system to determine the cost effectiveness of mitigation measures, consistent with OMB Circular A-94, guidelines and Discount Rates for Benefit-Cost analysis of Federal Programs, and
- [A system] to rank the measures according to the State's eligibility criteria..

Element

Does the **new or updated** Enhanced Plan demonstrate that the State has established eligibility criteria for multi-hazard mitigation measures? **Does the updated Plan describe changes, if any, to those criteria?**

Does the **new or updated** Enhanced Plan describe the State's system for determining the cost effectiveness of mitigation measures, consistent with OMB circular A-94? **Does the updated Plan describe changes, if any, to this system?**

Does the **new or updated** Enhanced Plan describe the State's system to rank the measures according to the State's eligibility criteria, **including a process to prioritize projects between jurisdictions and between proposals that address different or multiple hazards?**

Source: FEMA, Enhanced State Hazard Mitigation Plan Review Crosswalk 2007

Since 2012, NDEM administers all of the five federal hazard mitigation grant programs in the Unified Hazard Mitigation Assistance program, each of which is addressed in this section:

- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation Grants (PDM)
- Flood Mitigation Assistance Grants (FMA)

(In the last iteration, DEM administered only two of these programs, with the others administered by the Nevada Division of Water Resources)

Each of these programs requires applications for proposed activities (usually planning and project activities) and is reviewed for the following:

1. Consistency with federal and state eligibility criteria (Section 5.3)
2. Consistency with state mitigation priorities (Table 4-10)
3. Rank based on state ranking criteria (Section 5.3.1.1 and Figure 8-1 below)

8.2.1 Establishing Eligibility Criteria for Multi-Hazard Mitigation Measures

Before forwarding applications to FEMA, NDEM, DWR and NHMPC review proposed activities to ensure consistency with federal and state criteria. DEM documents the review and keeps a record of it. Figure 8-1 is an excerpt from the currently approved HMA Administrative Plan showing the eligibility criteria used by both DEM and DWR in reviewing applications for funding of mitigation activities under the HMA programs.

The first step in the eligibility review is done when the Notice of Intent (NOI) is submitted by the possible subapplicant. The SHMO and the Floodplain Manager jointly review these notices against the current guidelines and the eligibility criteria found in Figure 8-1 to ensure that both the subapplicant and the proposed project are eligible. A formal notification about the eligibility of each NOI is forwarded to each submitting entity stating the eligibility of the proposed activity. This is done prior to the NHMPC review to ensure that eligibility criteria are met prior to the subapplicant's investment of time in the benefit cost analysis and completion of the remaining required documentation such as commitment letters.

Next, the applications are reviewed by the NHMPC to provide feedback to eligible subapplicant and to ensure the application is feasible, cost effective, and is a long-term solution to the risk.

Any recommended revisions are formally presented to the subapplicant to revise. The subapplicants have several weeks to make the recommended revisions and enhance the application prior to a final review by the SHMO, Floodplain Manager (FM), and Mitigation Specialist who work with the subapplicant in making revisions to comply with the recommendations made by the NHMPC members.

Next, applications are prioritized by NHMPC using a numerical scoring process for clarity, consistency, and accuracy. This is done at open meetings where the scores from each NHMPC member are tabulated, added and averaged with the highest scoring proposals rating higher in priority. Immediately after prioritization, the SHMO and/or FM notify all participating subapplicants of the prioritization results and submit all applications to FEMA.

For HMGP funding, applications are submitted to FEMA in order of the priority assigned with consideration to the amount allocated to the state. Applications may be submitted out of order to ensure the use of all funding allocated.

Ranking and Selection of Applications

1. The NHMPC will be the review, ranking and selection panel for the Hazard Mitigation Assistance (HMA) program funding sources listed below.
    a. Hazard Mitigation Grant Program (HMGP),
    b. Pre-Disaster Mitigation Competitive (PDM),
    c. Flood Mitigation Assistance (FMA),
    d. Repetitive Flood Claim (RFC), and
    e. Severe Repetitive Loss (SRL) grant programs.
2. Each application will be reviewed for eligibility. It is the function of the NHMPC to review, prioritize and select projects for submission to FEMA for approval and funding.
3. Prioritization Criteria for HMA Applications

    Any application for mitigation funding must include all necessary data to allow the NDEM, NDWR and the NHMPC to evaluate the project in terms of the criteria listed below.

    The NHMPC will use the "NHMPC Prioritization Form" as a tool to help prioritize applications. The form uses the Prioritization Criteria for HMA Applications, Section I-3 "a" through "h" as applicable (weighted 40 percent) and the Additional Selection Criteria in Section I-4 "a" through "h" (weighted 60 percent) to prioritize applications submitted for funding under the HMA programs. Life safety issues shall be the primary consideration during evaluation of an application.

    a. Community Population Affected. The percent of the population benefiting, which equals the number of individuals directly benefiting divided by the community population.
    b. Public Perception of Need. The application will be evaluated in terms of satisfying the public's desire to see their money spent on "worthwhile" activities and the public's perception of the need.
    c. Emergency Access and Public Inconvenience. **Project** applications will be evaluated to determine its impact on the access of emergency vehicles including police, ambulance, and fire vehicles to their respective substation, hospital or station. The evaluation will include an assessment of the project's contribution to the accessibility to isolated residences, businesses, and public facilities created by the hazard. **For planning applications,** the application demonstrates the performance of plan maintenance and implementation of mitigation activities.
    d. Benefit Cost Analysis (BCA). The cost effectiveness of the **project** resulting in a BCA ratio equal to 1. **For planning applications**, the thoroughness of the scope of work demonstrating an understanding of the planning process and a methodology for completing the proposed mitigation plan.
    e. Availability of Other Funding Sources. This includes an evaluation of the potential for funds from other grants, and other public and private interests. Low score if other funding is available.

f. Timing and Implementation. All aspects of timing and implementation will be considered under this item including, but not limited to, the ability to administer, begin, and complete a project or plan within the performance period.

g. Environmental Enhancement. Evaluation of this criterion, for **project** applications, includes benefits derived from improving or mitigating the threat to public health. It also includes, if applicable, information on the project's enhancement of habitat, recreational opportunities, and water quality.

h. A **project's** resilience, sustainability and maintenance plan. Resilience is the ability to recover after an event. Sustainability is the environmental, social and economic concerns. The designation of a responsible party, schedule and funding for continued maintenance during the life expectancy of the project. **For planning applications,** the description of unique or innovative outreach activities appropriate to the planning process that advance mitigation and/or serve as a model for other communities.

4. Additional Prioritization Considerations

   The NHMPC will evaluate and prioritize all eligible applications using the criteria in 3 above and the considerations (a-h) below. See NHMPC Prioritization Form following this section. This ranking will be in accordance with the criteria in 44 CFR Section 206.

   a. Requests for funding must be consistent with the State and Local Hazard Mitigation Plans.

   b. Measures that, if not taken will have a detrimental impact on the subgrantee, such as potential loss of life, loss of essential services, damage to critical facilities, or economic hardship on the community.

   c. Measures that have the greatest potential impact on reducing future disaster losses (Repetitive Loss Properties).

   d. Measures designed to mitigate multiple hazards and/or accomplish multiple objectives including damage reduction, environmental enhancement, and economic recovery.

   e. Measures that optimize the total amount of funding available, including overmatching of Federal funds with non-Federal funds when developing this ranking.

   f. NHMPC will also consider the level of interest and demonstrated degree of commitment of each subgrantee.

5. The NHMPC makes the final decision on applications the State submits to FEMA .

6. When submitting more than one application to the State , the subgrantees must provide an internal ranking to the NHMPC.

PRIORITIZATION EVALUATION

Application Prioritization Criteria Section I-4 "a" through "h" (weighted 40 percent) and the Additional Selection Criteria in Section I-5 "a" through "g" (weighted 60 percent) will be rated by the NHMPC's Proposal Review Subcommittee on a scale of zero (0) through ten (10). The Subcommittee will use the total point values in the **PRIORITIZATION FORM** below as a guide to the overall evaluation.

Figure 8-1. Review, Ranking, and Selection Process

NHMPC Prioritization Form

Subgrantee: _____ **Activity Name:** _____

Ranking and Selection of Applications:

Application Prioritization Criteria (I-3)	**Assigned Value (0 - 10)**
a. Population Affected	
b. Public Perception of Need	
c. Emergency Access and Public Inconvenience *For **planning** applications:* *Performance of current plan maintenance activities & Implementation of mitigation activities.*	
d. Cost Effectiveness of the Project (BCA=1) (10 pts) *For **planning** applications: (15 pts)* *Understanding of the planning process and a methodology for completing the proposed mitigation plan.*	
e. Availability of Other Funding Sources	
f. Timing and Implementation	
g. Environmental Enhancement (10 pts) *For **planning** applications: (0 pts)*	
h. Resilience, Maintenance & Sustainability of Project (10 pts) *For **planning** applications: (15 pts)* *The description of unique or innovative outreach activities*	
Subtotal Prioritization Criteria (I-3, a thru h)	
Subtotal Criteria - (80-Point Maximum)/2 =	

Additional Prioritization Considerations (I-4)

a. Consistent with State & Local Mitigation Plan	
b. Detrimental Impact if Not Taken	
c. Greatest Impact to Reduce Future Disaster Losses	
d. Mitigate Multiple Hazards and/or Accomplish Multiple Objectives	
e. Optimize Total Funds Available	
f. Local Level of Interest & Degree of Commitment to Project	
Additional Considerations Combined (I-4, a thru f)	

(Max. 60 points)

Total Criteria + Considerations _____

(Max. 100 points)

Figure 8-2. NHMPC Application Prioritization Form

8.2.2 System to Determine the Cost Effectiveness of Mitigation Measures

FEMA-funded proposed activities must meet the criteria described in OMB Circular A-94 Guidelines. NDEM uses the most current version of FEMA's Mitigation Benefit-Cost Analysis (BCA) Toolkit, presently found in the portal at www.BCAhelpline.com which incorporates the discount rate and present day value in the B/C ratio calculations. Grant sub-applicants perform the benefit-cost analysis for each project application. Currently DEM provides basic benefit-cost training to potential applicants as part of the application workshops, allowing the applicants to perform their own analysis and request assistance from the helpline for complex questions. Advanced BCA courses are offered by FEMA, although not regularly in Nevada. DEM makes an effort to notify possible Nevada subgrantees about neighboring states venues where FEMA conducts such training. FEMA provided a training class on the newest version of its benefit cost analysis software this at the end of March 2013 in Carson City. At the state level, all proposed mitigation activities must be cost-effective as stated in criterion 3-d of Figure 8-1.

8.2.3 System to Rank the Measures According to the State's Eligibility Criteria

A task force of the NHMPC developed the criteria described in Figure 8-1 when the Pre-Disaster Mitigation competitive grant program was initiated in 2003. These criteria are now used to prioritize mitigation activities for all HMA programs that are managed by NDEM. NHMPC members are very knowledgeable about Nevada's communities, their risks, vulnerabilities, capabilities, and mitigation strategies. Together, the group has combined expertise in the identified and profiled highest-risk hazards for Nevada giving them the necessary professional background to address the proposals for all hazards and to allow competitiveness among a set of very diverse rural and urban communities.

PRIORITIZATION EVALUATION

Application Prioritization Criteria Section I-3 "a" through "h" (weighted 40 percent) and the Additional Selection Criteria in Section I-4 "a" through "f" (weighted 60 percent) will be rated by the NHMPC on a scale of zero (0) through ten (10). The Committee will use the total point values in the **PRIORITIZATION FORM** in Figure 8-2 below as a guide.

SUBMISSION OF SELECTED PROJECTS TO FEMA

1. The SHMO will prepare a project package for submission to FEMA containing:

    a. A narrative describing the anticipated project benefits, justification for recommendation and rationale for project selection;

    b. A certification that the project meets all eligibility requirements;

    c. The grantee and subgrantee must review the information submitted for content and make sure all documentation (such as maps, etc.) are included so FEMA can complete a NEPA review; Compliance with the National Environmental Protection Act (NEPA) is a FEMA responsibility.

    d. A completed SF 424, Application for Federal Assistance, signed by the GAR;

    e. All projects and supplements must be submitted to FEMA no later than one year from the declaration date or upon approval for extension.

2. The NHMPC will review, approve and prioritize selected projects for submission to FEMA.

3. Upon FEMA project approval, the SHMO will notify the NHMPC and subgrantees of which projects have been approved. A packet containing the following information will be provided to the approved subgrantees:

    a. Reporting requirements;
    b. Requesting funds;
    c. Eligible administrative costs;
    d. State-Local Disaster Agreement;
    e. State and Federal Assurances;
    f. Eligible administrative costs;
    g. State-Local Disaster Assistance Agreement;
    h. State and Federal Assurances

4. Upon FEMA disapproval of a project, the SHMO will advise subgrantees of the appeal process as outlined in 44CFR part 206.440.

Nevada is a small state and presidentially declared disasters tend to be sporadic and small in comparison to other states in Region IX. Thus applications for the HMGP program are not submitted in great numbers mostly due to the very limited funding this program brings. Historically all HMGP applications have been submitted to FEMA with a clear prioritization, several funded projects were not feasible due to the local economic conditions during the last three years. In the last three years, Nevada was among the hardest hit states economically. The hazard mitigation program currently has a library of proposed activities not funded under PDM

or FMA for consideration when HMGP or any funding source is available.

Applications not funded by FEMA are subsequently enhanced by the subgrantees using the NHMPC recommendations, and are resubmitted for funding under any funding source when available.

Below is a list of presidential disaster declarations in Nevada for the last decade and the amount allocated for mitigation for each declared disaster.

Table 8-1. Mitigation Funding Under Presidential Disaster Declarations

Year	Hazard Type	Mitigation Allocation
2012-2013	Drought	**
2008	Flood	$475,538
2006	Flood	$652,497
2005	Flood	$533,519
2004	Wildfire	$726,941

**Federal funding for drought relief is provided directly to the affected entity and thus is not tracked by the NDEM.

8.3 PROGRAM MANAGEMENT CAPABILITY

DMA 2000 REQUIREMENTS: PLAN MAINTENANCE PROCESS

Program Management Capability

Requirement §201.5(b)(2)(iii A-D): [An Enhanced Plan must demonstrate] that the State has the capability to effectively manage the HMGP as well as other mitigation grant programs, [and provide] a record of the following:

- Meeting HMGP and other mitigation grant application timeframes and submitting complete, technically feasible, and eligible project applications with appropriate supporting documentation;
- Preparing and submitting accurate environmental reviews and benefit-cost analysis;
- Submitting complete and accurate quarterly progress and financial reports on time; and
- Completing HMGP and other mitigation grant projects within established performance periods, including financial reconciliation.

Element

Does the **new or updated** Enhanced Plan describe the State's capability to effectively manage the HMGP as well as other mitigation grant programs?

Does the **new or updated** Enhanced Plan provide a record for meeting HMGP and other mitigation grant application timeframes and submitting complete, technically feasible, and eligible project applications with appropriate supporting documentation?

Does the **new or updated** Enhanced Plan provide a record for submitting complete and accurate quarterly progress and financial reports on time?

Does the **new or updated** Enhanced Plan provide a record for completing HMGP and other mitigation grant projects within established performance periods, including financial reconciliation?

Source: FEMA, Enhanced State Hazard Mitigation Plan Review Crosswalk 2007

8.3.1 Effective Management of HMA Programs

NDEM now administers all of the five federal hazard mitigation grant programs in the Unified HMA program. Both the SHMO and the FM continue to work very closely to implement all applicable mitigation programs. NDEM uses the established application review process shown in Figure 8-3 to ensure timely and adequate implementation of the HMA programs.

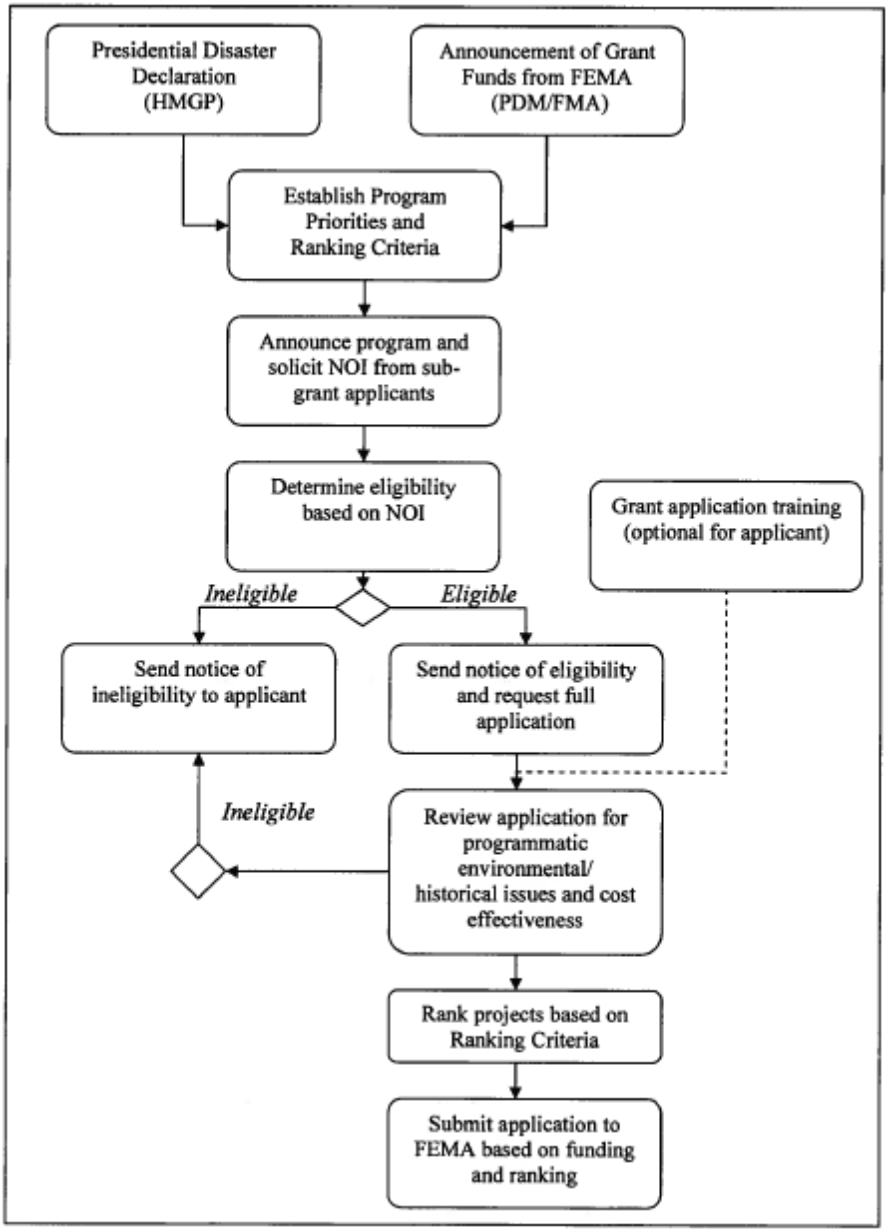

Figure 8-3. Mitigation Activities Review Process

The functions of the SHMO include the following:

1. Working with communities to develop appropriate grant applications for the HMA programs.
2. Fiscal management of grants when received.
3. Grant close-outs.

Based on the number of awards in the 2010-2013 period, NDEM has a successful record of meeting mitigation grant application timeframes and submitting complete, technically feasible, and eligible proposed activity applications with appropriate supporting documentation.

When the new federal guidelines for HMA funding are available, the SHMO and the FM hold intensive application training workshops at least once per year to increase the quality of applications. These training workshops cover specific grant programs, how to prepare an application, how to conduct a BCA, how to use the E-Grant system, and how to meet all basic requirements of each grant category. Before each new grant cycle or award, the SHMO reviews scoring criteria and considers FEMA changes to grant requirements and criteria. The SHMO notifies the NHMPC and potential subapplicants quickly if any modifications affect the criteria or process. This ensures that NDEM procedures are up-to-date and consistent with federal direction in hazard mitigation.

During the 2010-2013 period, NDEM has successfully processed 13 hazard mitigation awards under HMA programs one of which was an FMA project. All applications submitted were reviewed and the sub-applicants were provided feedback about proper documentation and the environmental questionnaire. Feedback and cooperation with the subgrantees occupy the available time of the State Hazard Mitigation Officer and one NDEM part-time staff member. Nevada exceeded its funding minimum allocation of $500,000 in the PDM program in 2010 through 2013. A listing of open, closed and pending awards is maintained by the SHMO in a spreadsheet format that tracks expiration date, quarterly reporting, closure and balances. This information is provided to the NHMPC and the public on a quarterly basis.

Program and financial reports for each award are reviewed by mitigation staff for completeness, content and appropriate programmatic responses. Mitigation staff, SHMO or Mitigation Specialist, will record any discrepancy or concern found in this initial review in the appropriate file, request a technical assistance meeting with the subgrantee to discuss the issue and note any corrective actions in the report for reference. Follow-up calls, emails and, if necessary, visits, are made to ensure the corrective actions are completed. Fiscal staff will accompany mitigation staff occasionally or depending on the corrective action.

Upon completion of the review by mitigation staff, the reports are forwarded to fiscal staff who audits them for consistency, accuracy, and eligibility of expenditures. Fiscal staff process reimbursement of funding based on quarterly report audits. Fiscal staff also maintain grant reconciliation reports showing balances and expenditures per grant by calendar year. A declining balance report for each HMA award is maintained allowing for consistent tracking of

balances. Mitigation staff members use these reports to manage the awards and to update NHMPC at quarterly meetings. A sample of the Monthly Reconciliation report is shown below in Figure 8-4.

PRE-DISASTER MITIGATION FFY-7
MANAGEMENT COSTS - PROJECT # 9701887
MONTHLY RECONCILIAITON

9701887

PLANNING JURISDICTION	GRANT AWARD AWARD	Deobligated	Additional	TOTAL	CLAIMS 1ST QTR.	2ND QTR.	3RD QTR.	4TH QTR.	5TH QTR.	TOTAL CLAIMS	Award Less Claims BALANCE	GRANT CLOSED	REIMB. OF INVOICES	INVOICES REPORTED	Unreported Inv. BALANCE
DEM Mngt Costs	$ 52,106.65			$ 52,106.65						$ -	$ 62,106.65				$ -
	$ 52,106.65	$ -	$ -	$ 62,106.65	$ -	$ -	$ -	$ -	$ -	$ -	$ 52,106.65		$ -	$ -	$ -

JOB # 9701887	
AWARD AMOUNT =	
Less Claims: $	-
GRANT BALANCE:	-

PROOF	
Fed AWARD	
Less Subgrants	
Unallocated	$ -
Locals Balance	$ 52,106.65
Balance	$ 62,106.65

RECONCILIATION OF EXPENDITURES V8 CLAIMS		
08/02/09	DAWN 74.0 3873 Expenditures SFY08:	-
08/02/09	DAWN 74.0 3874 Expenditures SFY08:	-
08/31/10	DAWN 74.0 3873 Expenditures SFY10:	-
08/31/10	DAWN 74.0 3874 Expenditures SFY10:	-
09/03/10	DAWN 74.0 3873 Expenditures SFY11:	-
09/03/10	DAWN 74.0 3874 Expenditures SFY11:	-
	Outstanding:	-
	TOTAL EXPENDITURES:	-
	Less Total Claims:	-
	DIFFERENCE:	-

reconciled on 09/10/10 mc

Figure 8-4. Sample Award Tracking Report

8.3.2 Environmental Review and Benefit-Cost Analysis

The SHMO ensures that all applicants have provided all required environmental information and benefit-cost analysis information in the application, including required documentation for all data sources and thorough description of calculations and assumptions. The SHMO and FM rely on the staff of FEMA Region IX, to conduct environmental reviews for construction projects seeking hazard mitigation grant funding from the HMA Programs. Before FEMA approval of a hazard mitigation grant, the project activities must comply with all applicable federal, state, and local codes and standards including the National Environmental Policy Act (PL 91-190, as amended) and all federal laws covered within the act, and for securing the necessary permits and approvals. Nevada does not provide funds to cover environmental reviews.

8.3.3 Quarterly Progress Report and Monitoring

The SHMO submits complete and accurate quarterly progress and financial reports on time. Quarterly reports based on measurable outcomes are generated by the sub-grantee and reported to NDEM. NDEM compiles the reports, assesses the programmatic and financial components, and sends the reports to FEMA. The reports include the following:

- Percent completion of the project
- Progress on milestones identified in the original schedule
- Overall assessment of the schedule
- Adherence to budget (including overruns and underruns)

If subgrantees do not submit timely and accurate quarterly reports or the reports indicate problems associated with the above components, NDEM will provide technical assistance and suggest corrective action. The SHMO requires the subgrantee to submit a plan for corrective action in writing. If the plan of action is not carried through, then payment processing is suspended.

The SHMO monitors the progress by reviewing the Quarterly Progress Report (see Figure 6-2 in Section 6, pages 6-9 and 6-10) and may, at any time, contact the subgrantee to review the project. Subgrantee quarterly reports are received both electronically and as hard copy; packaged by program; filed; and sent to the applicable FEMA Region IX staff. HMGP reporting is provided to FEMA via email and a hard copy via USPS. All other grant reporting is done through the eGrants system.

The success of the reporting and monitoring process is documented by two mileposts:

1. We have successfully tracked the progress and money trail of each of each subgrantee's project through completion and closure.
2. Subgrantees have generally adhered to budget.

One obstacle noted was that the great diversity in the type of projects presents a wide variety of issues to deal with; sometimes a new one with each project; it is a constant learning process.

Despite these challenges, the monitoring and reporting process is working well.

8.3.4 Mitigation Activities Completion and Closeout

The State of Nevada completes all mitigation grant activities within established performance periods, including financial reconciliation. The SHMO is responsible for HMA closeout procedures. Since the approval of the last plan in 2010, NDEM has successfully disbursed and closed out (or is in the close-out process) approximately 8 HMA individual grants and 2 complete HMGP programs.

The Hazard Mitigation Grant Program (HMGP) closeout procedures are initiated when the subgrantee informs the SHMO that the project has been completed and all expenditures are reimbursed. As part of the closeout procedure, the subgrantee is required to submit a final Quarterly Financial Report and cost documentation. The Pre-Disaster Mitigation (PDM) grant closeout procedure is initiated when:

1. The subgrantee informs NDEM that the project is completed, or

2. The performance period for the grant will expire.

As part of the closeout procedure, the subgrantee is required to submit a final Quarterly Financial Report and closeout documentation. For projects, the SHMO performs a site visit prior to closeout to confirm that the project has been completed as stated in the approved scope of work.

Nevada has no SRL properties and our goal is to keep that number at zero.

For each grant program, the SHMO ensures that quarterly reports and closeout documents are submitted on time. NDEM currently has a dedicated auditor position who performs fiscal site audits of subgrantee grant files.

If a project is not close to completion and its performance period is about to expire, first the SHMO evaluates specific details of the project with the subgrantee. The subgrantee is required to submit a plan of action for completion of the work on the project. Usually a request for time extension is sufficient to complete the project goals and objectives. In some cases the subgrantee's agency may provide additional matching funds necessary to complete work on a project. Other innovative approaches may be implemented depending upon the circumstances and the details of the specific project.

8.4 ASSESSMENT OF MITIGATION ACTIONS

DMA 2000 REQUIREMENTS: PLAN MAINTENANCE PROCESS

Assessment of Mitigation Actions

Requirement §201.5(b)(2)(iv): [The Enhanced Plan **must** document] the system and strategy by which the State will conduct an assessment of the completed mitigation actions and include a record of the effectiveness (actual cost avoidance) of each mitigation action.

Element

Does the **new or updated** Enhanced Plan describe the system and strategy by which the State will conduct an assessment of the completed mitigation actions?

Does the **new or updated** Enhanced Plan include the record of the effectiveness (i.e., actual cost avoidance) of each mitigation actions, **including how the assessment was completed?**

Source: FEMA, Enhanced State Hazard Mitigation Plan Review Crosswalk 2007

8.4.1 System and Strategy for the Assessment of Completed Mitigation Actions

Since 2003, NDEM has maintained a database that contains all HMA project files, from initial funding through project completion. This is made up of over 52 projects, 14 of which have been added since 2010. The database provides information on the scope of the projects, local contacts and it also provides examples to other communities of mitigation activities that could be done in their areas.

The database is structured such that in the event of a disaster occurring in the State, the SHMO may check the database to determine if a mitigation project has been funded in the immediate vicinity of that disaster area. Existing project files include locations, project particulars, and local contact people. Local contact is made by the SHMO to request a field report on the effectiveness of the mitigation project, with local participants making a determination of cost-avoidance. This process should provide quality assessment information of the effectiveness of local mitigation projects from the local level. Also, when an event occurs, field-gathered information is used in developing a state emergency proclamation and in requesting a federal disaster declaration. To date, since the implementation of the database, there has not been a disaster occurrence that correlates to a mitigation project type (i.e. earthquake, flood or wildfire) within the affected area of a completed mitigation project to test the effectiveness of the project.

8.4.2 Effectiveness of Mitigation Actions (Loss Reduction)

NDEM currently manages approximately 45 volunteers who participate in State Technical Assistance Response Teams (START), which assess damage after an incident. The START volunteers include representatives from the following agencies and professional groups:

- American Institute of Architects of Nevada
- Clark County School District
- Clear Result Consulting
- Nevada Bureau of Mines & Geology, UNR
- Nevada Department of Administration
- Nevada Department of Business & Industry/Insurance Division
- Nevada Division of Enterprise & Information Technology Services
- Nevada Division of Risk Management
- Nevada Department of Public Safety/Fire Marshal
- Nevada Department of Public Safety/Parole & Probation
- Nevada Department of State Budget
- Nevada Department of Transportation

- Nevada Department of Wildlife
- Nevada Division of Emergency Management
- Nevada Division of Forestry
- Nevada Division of Motor Vehicles
- Nevada Division of Records & Technology
- Nevada Division of Water Resources
- Nevada Public Utilities Commission
- Nevada State Public Works Board
- North Lake Tahoe Fire Protection District
- Northern Nevada Mental Health Services
- Storey County

as well as other members of the private sector.

A complete listing of current START members may be found in Appendix B. This wide range of professional expertise and backgrounds allows the START Teams to work efficiently to assess damage. START volunteers are coordinated by the Public Assistance Officer. Training and meetings of volunteers take place quarterly.

START training sessions have included:

- ATC-20 Post Earthquake Safety Evaluation of Buildings,
- Earthquake hazard mitigation for hospitals
- Calculation of square footage,
- Acquiring latitude and longitude,
- Photographing of damages,
- Use of communication equipment,
- Proper safety procedures
- Media management.
- Incident Command System
- National Incident Management System
- Benefit cost analysis

The SHMO is coordinates with the Public Assistance Officer and FEMA to provide this group with formal training, which in turn allows these volunteers to assess damage, capture data, and prepare reports necessary to complete the studies for losses avoided on completed hazard mitigation projects.

The START teams participate in drills and training provided by emergency management personnel in the state. The table below highlights the major drills which required full activation of the START teams. The group is divided into teams of 3 to 5 members. Each team at minimum is assigned a team leader, public information officer, safety officer, and scribe. Assigned tasks vary with each drill to ensure that everyone is proficient in each and every task.

Table 8-2. START Training Sessions in the 2010-2012 Update Period

March 15, 2010	START Structural Damage assessment training at NDEM
May 3-4, 2010	ATC 20/FEMA 154
July 2010	Virginia City Earthquake Drill. Assessed damage to 3 city streets with the assumption of a 6.7 magnitude earthquake. Included historical structure evaluation. Provided START to Storey County.
August 18, 2010	"FireStorm" START joint exercise with Virginia City
Nov.,2010	FEMA preliminary damage assessment training –Carson City EOC
August 12, 2011	Classroom and NDEM site training on flood damage assessment and identification and marking of High Water Marks
November 26, 2011	Mexican Dam" exercise- Structural damage and mitigation assessment
February 14, 2012	FEMA E-74 Earthquake Damage Webinar
April 18, 2012	Fire Behavior and PPE training
July 26, 2012	ATC 20 and FEMA 154 refresher class
August 31, 2012	Recovery pocket guide training

The process requires that trained members of the START volunteer program provide a professional assessment of completed mitigation projects and establish a record of the effectiveness (actual cost avoidance) of the mitigation actions. This approach provides statewide coverage to NDEM and provides the support of trained personnel through partnerships with cooperating organizations.

START teams are activated when any disaster event occurs and the affected local jurisdiction requests the assistance of the state in assessing damages, whether there is a Presidential

declaration or not. The assessment process consists of three phases: information gathering; site visit and damage assessment; and reporting of data to NDEM.

1. **Information gathering**: NDEM staff members retrieve files on funded mitigation projects in the immediate area based on location coordinates required for all such projects. This information along with the appropriate START assessment forms for the type of event (earthquake, flood, wildfire) and a summary of the project background are provided to the START team.

2. **Site visit and damage assessment**: The assembled information and forms are provided to the START team, which is then sent to the disaster location(s) to contact appropriate local agencies and conduct assessments of previously funded mitigation projects with a primary focus on estimating loss avoidance. This process was used in the Wells earthquake by the NBMG staff and worked well in gathering information from local affected stakeholders (government, utilities, residents, businesses, etc.)

3. **Reporting of data to NDEM**: Once the START team completes the physical site examination, they compile the START report and send it back to NDEM where the SHMO analyzes it in terms of the project's BCA and other factors such as avoidance of injury, loss of life, or environmental degradation.

For example, if the funded project was a structural retrofit to a URM building and an earthquake occurs, then the loss avoidance would be calculated as the construction cost to rebuild the building along with any loss of life or injury of those working in the building at the time of the event.

START reports and studies from preliminary damage assessment of recent events in Nevada include:

Report on the December 2012 northern Nevada severe winter storm from:

Pyramid Lake Paiute Tribe

Mineral County

Report on the August 2012 Clark County flash flood

Report on the May 2012 Topaz Ranch Estates Fire

Report on Jan. 2012 Washoe Drive fire

Report on Dec. 2011 Caughlin fire

Reports by START teams to NDEM following disaster incidents are provided to the NHMPC for their use in prioritizing proposed projects. These reports will also form part of the vulnerability assessment for the community and the state plan updates.

Nevada's long-term strategy is to create a risk reduction portfolio of all HMA type projects as well as to promote activities (such as building code adoption and resilient land use planning) to reduce risks over time. These findings can be used in determining the most effective or the highest priority mitigation projects for Nevada.

As previously mentioned, to date there has not been a disaster occurrence that correlates to a mitigation project type (i.e. earthquake, flood or wildfire) within the affected area of a completed mitigation project to test the effectiveness of the projects.

8.5 EFFECTIVE USE OF AVAILABLE MITIGATION FUNDING

DMA 2000 REQUIREMENTS: PLAN MAINTENANCE PROCESS

Effective Use of Available Mitigation Funding

Requirement §201.5(b)(3): [The Enhanced Plan **must** demonstrate] that the State effectively uses existing mitigation programs to achieve its mitigation goals.

Element

Does the new or updated Enhanced Plan document how the State has made full use of funding available from FEMA mitigation grant programs, and if the State has not made full use of this funding, does the plan explain the reasons why?

Does the **new or updated** Enhanced document how the State is effectively using existing programs to achieve its mitigation goals**?**

Source: FEMA, Enhanced State Hazard Mitigation Plan Review Crosswalk 2007

8.5.1 Effective Use of Available Mitigation Funding

Nevada uses many funds and programs to mitigate against injury, loss of life, and damage to property. Some of the major mitigation programs of the state are the federally funded HMA programs which are administered by NDEM.

Over the 2010- 2012 period, 14 FEMA grants are either approved and funded or under environmental review under the HMA programs in Nevada. The primary goal of the NHMPC is to ensure that every community in Nevada develops a hazard mitigation plan. The NHMPC believes that the planning process is the first step in awareness of the risk and vulnerability posed by the hazards and provides the communities with a method to "do something about the risk." This goal includes the updating of existing plans and enhancing the data available for locals to use in the update process. To date, every plan needing an update has acquired funding through the application process, and, where needed, communities have joined together to develop regional plans. Since the previous plan was approved in 2010, funding received for planning has allowed one county to develop a new plan and four to update their current plans, and five counties are developing two separate regional plans.

As a result, Nevada has reached its goal of all communities developing or updating hazard mitigation plans by 2013.

Planning funds have been "shared" by more than one community in the past. For example, in 2012, Humboldt, Lander and Pershing counties are developing a regional plan under the approved PDM 2011 funding. This leveraging of grant monies to develop regional plans is a very cost-effective way for rural communities to work together to become covered by a mitigation plan.

Nevada will use the plan maintenance process found in Section 6 to enhance its collection of data about locally funded mitigation projects to demonstrate the commitment of communities to the reduction of risk. Other funding sources such as the National Earthquake Hazard Prevention program have been used by the NBMG to enhance risk assessment tools and awareness of earthquake statewide, also need to be documented and presented in this plan. Private mitigation activities include the comprehensive seismic retrofit of churches in the City of Reno, and historic Virginia City. Another example of recent private/public partnership in mitigation occurred in Yerington where Circle Bar N Ranch owner Tom Reviglio came up with a river-dredging system idea based on similar successful projects in the Midwest. The City of Yerington was awarded a $1.2 million grant from the National Fish and Wildlife Foundation (NFWF), for the Walker River Basin Restoration Project. The centerpiece of that project is the $468,510 Walker River Dredging Project situated at the Circle Bar N Ranch site.

Local chapters of the Fire Safe Council, a coalition that is spearheaded by homeowners, the University of Nevada Cooperative Extension (UNCE), the Bureau of Land Management, the U.S. Forest Service, along with many state agencies, all work closely to coordinate a WUI Summit. The Summit's sole purpose is to provide homeowners and local government entities information about the wildfire mitigation activities, and possible sources for funding that can be done to protect life and property. Until 2012, the Summit occurred in September with up to 200 attendees from rural, urban, and "frontier" communities. Beginning in 2013, UNCE created a customized workshop for rural communities and will assess changes in risk since the writing of their community wildfire protection plans (CWPP). UNCE also developed a web-based application to update CWPPs. The computer application is an interactive tool involving stakeholders such as community members and local fire prevention professionals with a vested interest in wildfire mitigation activities.

Many agencies have spearheaded a variety of hazard mitigation projects that have been completed or are under way since the last iteration of the plan. These include the following:

- Clark County Regional Flood Control District completed 44 flood-control projects totaling $225.3 million from 2010 to early 2013.
- Truckee River Flood Management Authority has a long list of accomplishments in flood mitigation, restoration, prevention, public awareness education and outreach since 2009.
- Carson River Water Subconservancy District

Details of these projects are listed in Appendix P.

Many county-funded projects were completed. These investments in mitigation are located in the major disaster risk areas of Nevada according to the GIS modeling maps of local plans. FEMA mitigation funds allocated are closely linked to the state and applying community's plan goals. Prevention or significant reduction of loss of life and injuries is the state's primary goal.

The criteria used by DEM and NHMPC to solicit, select, and rank projects are clear and linked to maximizing project impacts that support the state plan goals. The DEM objective is to expend all funds in each grant program. DEM attempts to maximize local opportunities for receiving federal mitigation funding by establishing a project waiting list of HMA applicants from previous grant cycles from which to identify, prioritize and submit potential mitigation projects.

8.5.2 Nevada's Effective Use of Existing Programs to Achieve Mitigation Goals

A number of HMA programs fund multi-hazard mitigation planning activities at the local or multi-jurisdictional level. In addition to the FEMA support funding shown in Table 8-3, Nevada communities augment mitigation funds with those provided through many other sources. Some of these local and private sources that partner with the state are listed in Tables 4-11, 4-12, and 4-13. Partnering with local and private groups in mitigation planning and projects promotes increased awareness and participation in mitigation activities on a local level. For example, the City of Yerington has partnered with the National Fish and Wildlife Foundation, and the Circle Bar N Ranch on a project under the federally-funded Walker Basin Restoration Program.

http://www.nfwf org/Pages/walkerbasin/home.aspx

Another example is Nevada Wildfire Awareness Week, an annual event that builds awareness and encourages action to reduce the wildfire threat to Nevada homes and communities. It is a partnership among federal and state agencies, community members and private entities. A listing of all sponsors may be found at this link:

http://www.livingwithfire.info/wp-content/uploads/2013/03/NWAW-2013-Planning-Group-Contacts.pdf

The Great Nevada ShakeOut is another example of a partnership between State and federal agencies, Universities, casinos, and other community members, in earthquake hazard mitigation activity. It is a earthquake drill that is broadcast simultaneously throughout the state.

More information on the 2013 Great Nevada ShakeOut is available at this website:

http://www.shakeout.org/nevada/

Table 8-3. 2005 to 2012 FEMA-Supported Grant Activities in Nevada

HMGP

Disaster Number	Selected	Obligated	Expended	Deobligated	Status
1540	$ 726,541.00	$ 726,541.00	$ 519,877.54	$ 206,663.46	Closed
1583	$ 533,519.00	$ 533,519.00	$ 392,541.00	$ 140,978.00	Closed
1629	$ 625,497.00	$ 625,497.00	$ 624,552.07	$ 944.93	Pending subawards closure
1738	$ 475,537.56	$ 71,092.56	$ 44,906.23		Pending awards
Total	$2,361,094.56	$1,956,649.56	$1,581,876.84	$ 348,586.39	

PDM

Funding Year	Selected	Obligated	Expended	Deobligated	Status
2004-2005	$ 60,063.50	$ 60,063.50	$ 60,063.50	$ -	Closed
2006	$ 29,115.00	$ 29,115.00	$ 29,115.00	$ -	Closed
2007	$ 467,586.75	$ 467,586.75	$ 420,112.49	$ 47,474.26	Closed
2008	$ 521,066.92	$ 521,066.92	$ 111,058.51		In process
2009	$ 970,905.00	0	$ -		Pending awards
2010	$3,182,907.31	$1,806,991.31	$ 326,015.97		Pending awards
2011	$ 823,476.59	$ 60,006.59	$ 17,709.23		Pending awards
2012	$2,362,335.27	$ 501,986.52	$ 5,754.95		Pending awards
Total	$8,328,277.84	$3,446,816.59	$ 909,766.15	$ 47,474.26	

FMA

Funding Year	Selected	Obligated	Expended	Deobligated	Status
2012	1,930,138.27				Pending awards

RFC

Funding Year	Selected	Obligated	Expended	Deobligated	Status
-	0	0	0	0	0

Table 8-3 is a summary of the status of all FEMA grant funds for hazard mitigation activities received between 2005 and 2012. All mitigation activities associated with the grant awards have been completely implemented according to the grants scopes of work. The information found on Table 8-3, regarding HMA awards includes 4 disaster declarations beginning in 2004 ending in 2008. Nevada has not received a presidential disaster declaration since 2008. Note the following items on Table 8-3.

- The HMGP difference between the obligated and expended funds is due to cost savings on 2 projects awarded in the 2004 and 2005 disasters. During these two disasters,

subapplicant awareness of the hazard mitigation program was limited and the state received only enough applications to cover the amount awarded by FEMA. Since 2005, increased subapplicant awareness of the program has built up an inventory of mitigation on-the-shelf projects that are available for submission when events occur or funding sources become available, allowing the state to utilize all awarded funds when cost-savings occur.

- For Disaster #1629, the $944.93 in the Deobligated column is cost savings from subgrantee in travel costs and the expiration of the performance period.

  For PDM 2007, the $47,474.26 in the Deobligated column results from the project coming in under budget due to changes in the economy. Grant restrictions do not allow the transfer of these funds to another project.

- The discrepancy between Selected and Obligated amounts arises because there are projects pending obligation.

- The dollar difference the “Selected” and “Obligated” columns of Table 8-3 is a result of the sluggishness of FEMA’s National Environmental Policy Act compliance review process for all HMA selected projects.

- For PDM awards, the difference between the obligated and expended funds is due to pending submission of expenditures by the subgrantee for activities that fall within the performance period.

- FMA funding has increased to one funded project due to the currently less restrictive nature of program guidelines. Prior to 2010, the requirement of 50-percent-insured structures hindered submission of otherwise strong mitigation activity applications.

- The elevated value of homes in the last update period resulted in a low Benefit Cost Ratio (BCR) that inhibited submission of proposals under the RFC (Repetitive Flood Claims) program. Recent lower home values due to the current economic conditions may result in increased submission of proposals under the RFC program in Nevada if funds become available.

Nevada has been proactive in addressing repetitive flood property such as the following program targeted at the flood-prone areas of the Truckee Meadows. The Truckee River Flood Management Authority continues to actively support the Living River Plan - a flood management plan for the Truckee River under which repetitive flood properties have been acquired, including the following:

- UNR's Mill and McCarran Property (60 acres)
- 85 N. Edison Way (1 acre)

- 105 N. Edison Way (1 acre)
- 195 N. Edison Way (1 acre)
- Monday Property (17 Lockwood - 1 acre)
- Excel Property (8 acres)
- Catholic Diocese Property (14 acres)
- Ferrari Property (22 acres)
- 102 Ranch (128 acres)
- A portion of UNR Farms (60 acres), a portion of Butler Ranch (800 acres), and 5 other properties.

Nevada's mitigation program has successfully accomplished its planning goal of developing hazard mitigation plans for all Nevada counties (all are at least in the planning process). The State has successfully developed relationships among agencies and brought awareness to communities about their risk and the State will continue to assist rural communities with mitigation plans to apply for funding to reduce risks. This has been addressed by continuing to hold NHMPC meetings in local communities, which has both heightened awareness of hazard risks and successfully encouraged application for grant funding available to develop local plans to combat these risks. The mitigation staff has also developed a TableTop Exercise (TTX) that is performed at each community's LEPC meeting where an approved hazard mitigation plan exists to help with continued plan maintenance.

8.6 COMMITMENT TO A COMPREHENSIVE MITIGATION PROGRAM

DMA 2000 REQUIREMENTS: PLAN MAINTENANCE PROCESS

Commitment to a Comprehensive Mitigation Program

Requirement §201.5(b)(4)(i-vi): [An Enhanced Plan **must** demonstrate] that the State is committed to a comprehensive state mitigation program, which might include any of the following:

- A commitment to support local mitigation planning by providing workshops and training, State planning grants, or coordinated capability development of local officials, including Emergency Management and Floodplain Management certifications.;
- A Statewide program of hazard mitigation through the development of legislative initiatives, mitigation councils, formation of public/private partnerships, and/or other executive actions that promote hazard mitigation;
- The State provides a portion of the non-Federal match for HMGP and/or other mitigation projects.
- To the extent allowed by State Law, the State requires or encourages local governments to use a current version of a nationally applicable model building code or standard that addresses natural hazards as a basis for design and construction of State sponsored mitigation projects.;
- A comprehensive, multi-year plan to mitigate the risks posed to the existing buildings that have been identified as necessary for post-disaster response and recovery operations.;
- A comprehensive description of how the State integrates mitigation into its post-disaster recovery operations.

Element

Does the **new or updated** Enhanced Plan demonstrate that the State is committed to a comprehensive State mitigation program?

Does the updated Enhanced Plan demonstrate progress in implementing a comprehensive State mitigation program, including new mitigation initiatives developed or implemented by the State?

Source: FEMA, Enhanced State Hazard Mitigation Plan Review Crosswalk 2007

8.6.1 Commitment to Support Local Mitigation Planning

The SHMO works closely with the State Floodplain Manager (FM) to provide workshops, training, and technical assistance to the local emergency, tribal, and floodplain managers, government officials, firefighters, grant managers, and private sector consultants. The ultimate goal of these workshops is to assist each community in reaching its goal of having an approved local hazard mitigation plan (LHMP). The current status of LHMP is shown in Figure 8-3 below. Details of local and tribal plan status are located in Tables 5-1 and 5-2 of Section 5 of the plan.

- The FM sponsors 2 to 4 annual workshops for floodplain managers providing information on the NFIP National Flood Insurance Program. These workshops include education about the Community Rating System (CRS) which is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements by reducing their flood insurance premiums. Another workshop presentation is the Risk Map program, which increases public awareness and leads to action that reduces flood risk to life and property.

- Annually the FM and the SHMO jointly coordinate and present two grant application workshops for potential subgrantees to the HMA funding programs.

- During the LHMP update process mitigation staff attends planning meetings

- SHMO staff schedules an annual visit to each community with an approved LHMP where it performs a Table Top Exercise (TTX) that it has developed to help them with continued plan maintenance.

- In addition, the FM provided a comprehensive week-long L273 workshop to Floodplain Manager statewide that covered building codes, elevations, insurance, FEMA policies, etc. This may be repeated on an as-needed basis.

- The Nevada State Mapping Advisory Committee (SMAC) provides critical technical assistance to local, state and tribal entities. SMAC was established to advise the U.S. Geological Survey (USGS) on state priorities for map products and to inform map users about the status of mapping programs and the availability of map products. Membership in SMAC and its subcommittees is open to anyone interested in mapping in Nevada. Two subcommittees are currently active: one for geographic information systems (GIS) and one for geologic mapping. Participants include representatives of numerous local, state, and federal agencies, community colleges and universities, and the private sector. Additional data about SMAC is available at this website: http://www.nbmg.unr.edu/smac/smac.htm

- The Nevada Earthquake Safety Council (NESC) educates the public about earthquake hazards and promotes earthquake awareness activities such as the Great Nevada Shake Out that help save lives, reduce property loss, and speed recovery from earthquakes. NESC assists local and state agencies in preparing for post-earthquake response and recovery, and promotes earthquake resistance in new and existing structures.

- Silver Jackets is a partnership among federal (USACE, NOAA, FEMA, USGS, NRCS), state (NDEM, NDWR, NDOW,) and local agencies and non-profits formed to reduce the risks associated with flooding and other natural hazards in Nevada. It provides a formal and consistent strategy for an interagency approach to planning and implementing measures. Involvement from other regional, local, and tribal groups within this program will improve and increase flood risk communication with a unified interagency message and help collaboration on flood mitigation, response, and recovery.

NDEM and NDWR staff continue to maintain positive working relationships with local governments through phone, e-mail, conference calls, and meetings providing technical assistance, support, and information as needed.

8.6.2 Statewide Programs Promoting Hazard Mitigation

Sections 2, 3, 5 and Section 8.1.1 have already detailed many of Nevada's statewide hazard mitigation programs including legislative initiatives and executive actions that promote hazard mitigation. Some of the higher profile statewide programs dealing with Nevada's highest ranked hazards are summarized below:

- **Nevada Earthquake Safety Council** (NESC) is a statewide body representing a partnership of the public and private sectors that uses its professional expertise and community knowledge to make earthquake safety recommendations within the public and private sectors, and serve as the advisory body for State seismic safety policy. The current membership of NESC is listed in Appendix B. Their website includes policy statements, strategic plans, meeting minutes and annual reports, located at this link: http://www.nbmg.unr.edu/nesc/

  Living With Fire Program is managed by University of Nevada Cooperative Extension, and is a collaborative effort involving many organizations to help make communities more likely to survive a wildfire. Together with Nevada's firefighting organizations, they developed a set of consistent wildfire threat reduction recommendations that are shared with schools, homeowners, community groups, and firefighting professionals to help educate and inform those living in fire-prone areas about mitigating Nevada's wildfire threat. Partners include the University of Nevada Cooperative Extension, the Bureau of Land Management, U. S. Forest Service, and Nevada Division of Forestry who promote the development of Fire-Adapted Communities (FACs). Please see additional details found on the website at http://www.livingwithfire.info/

- **Silver Jackets** is a partnership among federal (USACE, NOAA, FEMA, USGS, NRCS), state (NDEM, NDWR, NDOW,) and local agencies and non-profits formed to reduce the risks associated with flooding and other natural hazards in Nevada. It provides a formal and consistent strategy for an interagency approach to planning and implementing measures. Involvement from other regional, local, and tribal groups within this program will improve and increase flood risk communication with a unified interagency message and help collaboration on flood mitigation, response, and recovery.

Listed below are some statewide programs that involve partnering among State, local and/or private sector groups to achieve specific local mitigation planning efforts.

- NDEM partners with the Nevada Insurance Pool and NBMG through PDM grants to develop information such as HAZUS run data for earthquake and flood for each county. This data is distributed to local jurisdictions for their use in loss estimation and mitigation planning. Additionally, NDEM has worked with UNR through an HMGP grant to develop a statewide report of geocoded potential URM building locations (by county) published as *Preliminary Assessment of Potentially Unreinforced Masonry Buildings: Nevada Bureau of Mines and Geology Report 54,*

available free online. Another NDEM grant-supported NBMG product under way is a GIS inventory of ditches in the northwest part of the state.

- FEMA has provided funds for NBMG to develop a "MyPlan" website to assist local planning professionals in the data collection necessary to address the risk and vulnerability assessment information required for hazard mitigation planning in their communities. Gary Johnson at NBMG is the project lead on this and has been conducting informational presentations both to the NHMPC, NHMP subcommittee as well as to the local LHPCs to familiarize them with this resource available to help them in development of their mitigation plans, and to inspire them to provide more raw data to enter into it to make it a more valuable tool. The website has many participating partners across state lines including California Emergency Management Agency in California, NDEM, NDOT, and NBMG in Nevada, with NBMG acting as the lead in this project. The format is standardized with California's and the website provides local counties and tribes with information and mapping of local hazards and for counties to upload hazard/risk data. This allows local counties and Nevada a database that can be improved upon over time when additional data becomes available. It is designed to allow local and tribal communities to overlay the hazards layers upon their built environment for a full risk and vulnerability assessment. Providing a more detailed risk assessment to local communities will improve their hazard mitigation planning efforts and allow a better project identification and prioritization process.

- NBMG continues to update the HAZUS database with current building inventory and posting Open File Reports online with HAZUS flood data on major rivers as well as earthquake data for more than 37 rural communities in Nevada.

- The University of Nevada collaborated with local building officials in southern Nevada to develop a microzonation of soil types that will enhance the ability of the officials to develop and enforce building codes according to the soils found in the area. The soil type can affect the stability of the foundations as a result of liquefaction during earthquakes and because of swelling clays common in the region. The only portion remaining to be mapped in the greater Las Vegas Valley is the city of North Las Vegas.

- The NHMPC continues to meet in locations statewide with wide and great acceptance by local communities. The meetings provide awareness of mitigation and resiliency successfully as shown by the completion of local hazard mitigation plans statewide and the increase in applications for projects for all identified natural hazards.

8.6.3 State Provision of a Portion of the Non-Federal Match for Mitigation Projects

Although there is no provision for any portion of the State to provide a match for mitigation projects, there are other potential sources of State funding that may be used to match federal grants for specific projects. Some examples follow:

- State NRS 414, Emergency Management, provides the Disaster Relief Fund and the Emergency Assistance Account which can be used by the state to match projects in qualifying communities for post-disaster costs including hazard mitigation.

- UNR continues to provide the match on planning activities such as HAZUS earthquake and flood runs.

8.6.4 Promotion of Nationally Applicable Model Building Codes.

Since 1981, the State of Nevada has adopted a series of nationally applicable model building-related codes that local governments (with the exception of Clark County) are required to enforce. The existing State codes are shown in Table 8-4. Local governments may also adopt these codes with amendments that are more restrictive than the state adoption, but may not be less restrictive. Adoption of these codes by local jurisdictions will make local mitigation more effective. NHMPC takes into consideration the adoption of the State building codes when prioritizing proposals by the communities applying for hazard mitigation funding. NHMPC identifies those local governments with policies currently in place that include strong hazard mitigation programs and offers them as positive examples to other Nevada communities and local governments in developing their own effective hazard mitigation plans and ordinances. The State provides guidance to these communities, and supports pass-through funds available to communities interested in adopting hazard mitigation actions.

Table 8-4. Existing State Model Codes Promoted for Adoption by Local Governments

Policy	Description of Model Codes	Applicability
Building and Fire Codes	The State has adopted a building code and local governments are required to adopt and enforce this code with the exception of Clark County. **NRS 278.580 –** Amend building codes to include seismic provision of the International Building Code. **NRS 461.170 –** Manufactured buildings required to use the various uniform codes. **NRS 477.030 (1)–**Requires the State Fire Marshal to adopt minimum fire and building codes to ensure fire safety. **NRS 477.030 (12)-**Provides an exception requested by Clark County where the state codes do not apply in that county **NRS 514.040(3) –** Nevada Bureau of Mines and Geology to apply geologic engineering principles to construction, etc. **NRS 623 –** Architecture, Interior Design and Residential Design.	The adoption and enforcement of building and fire codes relates the design and construction of structures to standards established for withstanding wildfires, earthquakes, flooding, dam failure, and high winds.
Zoning	Laws and ordinances regulate development by dividing the community into zones and by setting development criteria for each zone. **NRS 278.160 –** Planning and zoning.	Zoning can keep inappropriate development out of hazard-prone areas and can designate certain areas for such things as conservation,

Table 8-4. Existing State Model Codes Promoted for Adoption by Local Governments		
Policy	**Description of Model Codes**	**Applicability**
	NRS 278.580—Investigation of seismic hazards: fault, fissure, and liquefaction. **NRS 410.095 through 410.210 –** Regulation and restriction of landfills, garbage dumps, and junkyards.	public use, or agriculture. Zoning can also be used to control construction by dedicating areas for cluster development or planned unit development. The State currently works with local governments on implementing these last two policies.
Land Use Planning	Comprehensive land use planning provides a mechanism to prevent development in hazardous areas or allows development in a manner that minimizes damage from hazards. Land use planning gives local governments "the big picture" of what is happening in their jurisdiction. **NRS 278.02521 –** Protecting environmentally sensitive areas **NRS 278.160 –** Planning and zoning. **NRS 278.580—**Investigation of seismic hazards: fault, fissure, and liquefaction. **NRS 321.640 through 321,770 –** Laws to govern growth and use of lands which could impact emergencies. **NRS 324 –** Regulates use of water and reclamation of water projects. **NRS 376A –** Taxes for development of open space land. **NRS 472 –** Fire warden's duties to include preservation of forest and vegetation cover. **NRS 528 –** Regulation of forest practice and reforestation. **NRS 534 –** Planning and development of water resources and management of water resources.	Local governments can use land use planning to identify those areas subject to damage from hazards and work to keep inappropriate development out of those areas. Land use planning can also be used for more regional approach when local governments work together.
Subdivision Regulations	Sets construction and location standards for subdivision layout and infrastructure. **NRS 445D –** Environmental covenants that attach to real property.	Contains standards for such things as storm water management and erosion control
Capital Improvements Planning	Identifies where major public expenditures will be made over the next 5 to 10 years.	Capital Improvement Plans can secure hazard-prone areas for low risk uses, identify roads or utilities that need strengthening, replacement, or realignment, and can prescribe standards for the design and construction of new facilities.

Table 8-5 below provides the current status of adoption of different building codes by local governments In Nevada.

Table 8-5. Code Adoption by Jurisdiction, as of February 2013

JURISDICTION	IBC	IRC	UPC	UMC	NEC	IECC	IFC	OTHER	AMENDMENTS
CARSON CITY	2012	2012	2012	2012	2011			2012 International Mechanical Code 2012 International Fuel Gas Code 2012 IPMC 2012 IEBC 2012 USPSHT	2012 Northern NV Amendments 2011 Northern NV Energy Code Amendments
CLARK COUNTY SCHOOL DIST	2006		2006	2006	2008	2009	2006	NV STATE FIRE MARSHAL NRS 477.030 (12)(6)	YES
CLARK COUNTY BLDG DEPT	2009	2009	2009	2009	2008	2009	2009	2009 SO NV POOL CODE	YES
CITY OF LAS VEGAS	2009	2009	2009	2009	2008	2009		2010 AMUSEMENT RIDE CODE 1997 Uniform Administrative Code	
BOULDER CITY	2009	2009	2009	2009	2008	2009		2009 SO NV POOL CODE	YES
CITY OF NO LAS VEGAS	2009	2009	2009	2009	2008	2009	2009	2009 SO NV POOL CODE	YES
DOUGLAS COUNTY	2006	2006	2006	2006	2005	2006	2006		
STATE OF NV (NAC 477.281)	2006	N/A	2006	2006	N/A	N/A	2006	2009 IUWIC	YES(NAC 477.283)
CITY OF SPARKS (*PENDING ADOPTION*)	2012	2012	2012	2012	2011	2009		2012 IEBC 2012 ISPSC 2012 IWUIC 2012 IGCC NFPA 58 & 54	YES
WASHOE COUNTY (*PENDING*	2012	2012	2012	2012	2011	2009		2012 IEBC 2012 ISPSC 2012 IWUIC	

Table 8-5. Code Adoption by Jurisdiction, as of February 2013									
JURISDICTION	IBC	IRC	UPC	UMC	NEC	IECC	IFC	OTHER	AMENDMENTS
ADOPTION)								2012 IGCC NFPA 58 & 54	
CITY OF RENO *(PENDING ADOPTION)*	2006	2006	2006	2006		2009			YES
LYON COUNTY	2006	2006	2006	2006	2005	2006	2006		
ELKO COUNTY	2009	2009	2009	2009	2008	2009	2009	1997 UAC 2003 IEBC 2003 IMC & IPC for reference only	YES
NYE COUNTY	2006	2006	2006	2006	2005	2006	2006	2006 IPMC 2006 USPSHT	

NOTES:
Lyon County will be adopting the 2012 I codes and UPC/UMC, as well as 2011 NEC in a few months.
IEBC – International Existing Building Code
ISPSC – International Swimming Pool and Spa Code
IWUIC – International Wildland-Urban Interface Code
IGCC – International Green Construction Code
UAC – Uniform Administrative Code
IPMC – International Property Maintenance Code
USPSHT – Uniform Swimming Pool, Spa & Hot Tub Code
Elko County is currently reviewing the 2012 I-codes
Nevada State Public Works Division – Pertinent to State-owned buildings only-2012 editions of the code.
Nevada L_P Gas Board – NFPA S4 (2009 edition) and NFPA S8 (2008 edition) – applies statewide.
Nevada Division of Industrial Relations –Elevator Codes A17-1, A17-3 and others -2007 editions.

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8.6.5 Post-Disaster Mitigation of Building Risks

Through partnerships with the Nevada Earthquake Safety Council, the Nevada Fire Safe Council, the State Floodplain Manager, and other groups, the state has begun a comprehensive, multi-year effort to mitigate risks posed to existing buildings identified as necessary for post-disaster response and recovery operations.

Buildings identified as necessary for post-disaster response and recovery operation include:

- facilities used by first responders
- buildings used as evacuation centers, such as schools
- water facilities needed by communities
- critical communication infrastructure
- hospitals and clinics
- major utility sources

NBMG has recently completed a project in which all potential URM buildings in the state were identified and geotagged with GPS coordinates in a user-friendly database. This database provides a starting place for field-checking to verify which ones are definitely URMS. The next step in completion of this project will be developing a grant that includes a funding request for field verification of the potential URMs statewide with particular reference to identifying which are critical facilities and schools. Once this is complete, a subset of critical state and local buildings will be compiled and mapped providing vulnerability assessment information for mitigation activities as well as information for the response effort. This database will be expanded to include additional critical facilities and structures as they are identified and located. This will help mitigate the risks posed to these structures essential to post-disaster response and recovery operations. Also as part of the RiskMap program, NDWR and NDEM work together in the development and update of local plans to provide risk data for communities to bring awareness of the location of the hazard in reference to the current building inventory with the development of flood depth grids as data (mostly locally funded LiDar) becomes available.

8.6.6 Integration of Mitigation with Post-Disaster Recovery

Hazard mitigation is an integral part of Nevada's post-disaster recovery operations. When a Presidentially declared disaster occurs, a joint field office is opened and operated by FEMA. The State Hazard Mitigation Officer is co-located with the recovery Public Assistance Officer who manages the public assistance program. Staff members from several other state agencies such as NDOT, NDF, NBMG as well as local stakeholders may also be situated here, allowing for the identification of a wide spectrum of mitigation elements in recovery, repair, and restoration projects. Mitigation and public assistance program staff jointly conduct applicant briefings to discuss mitigation opportunities through both public assistance and hazard mitigation grant programs. The SHMO quickly disseminates letters of intent and information on

the HMGP, and provides technical assistance to potential applicants. The SHMO coordinates with NHMPC members and with FEMA staff to develop a strong hazard mitigation strategy that includes the following elements:

- Technical services
- Support to 406 mitigation
- Hazard Mitigation Planning
- Hazard Mitigation Grant Program (HMGP) Technical Assistance
- Community Education and Outreach

The intent of Nevada's HM program is to increase the resiliency of communities in Nevada. As always, more work in outreach can be done to bring additional programs to partner in hazard mitigation efforts. In Nevada, the Threat Hazard Identification and Risk Assessment (THIRA) program is a good example of a new program integrating hazard mitigation data for response and recovery purposes.

State of Nevada

Executive Department

Executive Order 2013-15

EXECUTIVE ORDER AMENDING THE OCTOBER 30, 2007 AND OCTOBER 6, 2010 EXECUTIVE ORDERS ADOPTING THE NEVADA STANDARD MULTI-HAZARD MITIGATION PLAN AND THE SUBSEQUENT NEVADA MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Nevada Department of Public Safety, Division of Emergency Management, in coordination with the Nevada Hazard Mitigation Planning Committee, has developed the Enhanced Hazard Mitigation Plan for the State of Nevada; and

WHEREAS, the Plan identifies hazards that threaten Nevada's citizens and property, and identifies and prioritizes projects to reduce or eliminate those threats; and

WHEREAS, the State of Nevada must adopt the Enhanced Hazard Mitigation Plan in order to be compliant with the Section 322 of the Federal Disaster Mitigation Act of 2000, and to be eligible for increased disaster assistance; and

WHEREAS, Article 5, Section 1 of the Nevada Constitution provides that, "The supreme executive power of this State, shall be vested in a Chief Magistrate who shall be Governor of the State of Nevada."

NOW, THEREFORE, by the authority vested in me as Governor by the Constitution and laws of the State of Nevada, I hereby direct and order as follows:

1. The Enhanced Hazard Mitigation Plan, as updated on October 3, 2013, is hereby adopted by the State of Nevada.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the State of Nevada to be affixed at the State Capitol in Carson City, this eighth day of October, in the year two thousand thirteen.

Governor of the State of Nevada

By the Governor:

Secretary of State

Deputy Secretary of State

The State Plan was prepared by the Nevada Hazard Mitigation Planning Committee and Subcommittee members (listed in Section Two) with the support of their participating agencies and participation from various other State, local, and tribal entities. The names of groups that provided representatives and contributed technical information in support of the plan are listed and further described below:

The Nevada Earthquake Safety Council - http://www.nbmg.unr.edu/nesc/

The Wildland Urban Interface Summit - http://www.livingwithfire.com/?click=nevadawildland

Nevada Local Emergency Managers - http://dem.state.nv.us/coordinators.shtml

State, County, Tribal Emergency Managers

State Technical Assistance Response Team (START)

Living With Fire Program cooperating partners

Silver Jackets Program partners

Nevada Bureau of Mines & Geology

In addition to those listed, the following groups provide their expertise and support to the NHMPC and Planning Subcommittee:

- State Emergency Response Commission - http://www.serc.nv.gov/membership.htm
- State Mapping Advisory Committee - http://www.nbmg.unr.edu/smac/smac.htm
- Preliminary Disaster Assistance Teams:
- Nevada League of Cities
- Nevada Association of Counties
- Voluntary Organizations Active in Disasters (north and south)
- Community Development Block Grants
- Floodplain Managers

B.1 Nevada Earthquake Safety Council

The mission of the Nevada Earthquake Safety Council (NESC) is to advise the Nevada Earthquake Risk Reduction Program. The Council facilitates public input, develops consensus about seismic issues within the public and private sectors, and is the public advisory body for State seismic safety policy. The Board of Directors is listed in the latest meeting minutes. The business of the Council is conducted by the Board of Directors,

which is composed of 22 Directors. 12 Directors shall constitute a meeting quorum. Voting shall be by Directors and a representative from the Division of Emergency Management.

The Board of Directors shall be appointed by the Division of Emergency Management. Prior to the Fall meeting, the Chairperson shall appoint a three (3) person ad hoc nominating committee. At the Fall meeting, the Committee shall nominate their proposed list of Directors. Additional Directors may be nominated from the floor. The nominations shall conform to the board membership categories as shown. These nominations will be forwarded to the Chief, Division of Emergency Management for an official appointment. The recommended term for Board of Directors is two years, with no limitation on re-appointment. Newly appointed Directors shall assume their office immediately if the position is vacant; otherwise at the next scheduled Council meeting. Any Director who is unable to attend a specific meeting of the Board of Directors of the Nevada Earthquake Safety Council may designate, in writing to the Chairperson, an alternate. This alternate shall be for a specific meeting and is empowered to take all actions the Director is empowered to take. Board membership is composed of representatives from:

Business and Industry: 1 Southern
Government: 3 (1 State, 1 Local/City, 1 Local/County jurisdictions)
Geosciences: 2 (1 Northern, 1 Southern)
Engineers: 2 (1 Northern, 1 Southern)
Community 2 (1 Northern, 1 Southern)
University: 2 (1 Northern, 1 Southern)
Building Officials: 2 (1 Northern, 1 Southern)
Insurance Industry: 1 (Statewide)
Education: 1 (Statewide)
Seismologist: 1 (Statewide)
State Legislators: 0 (0 from Senate, 0 from Assembly)
Member at Large: 2 (1 Northern, 1 Southern or Statewide)

NESC current membership listed in the table below:

Nevada Earthquake Safety Council (NESC) 2013

Name	Department/Organization
Alan Bennett	City of Reno
Mike Blakely	Blakely, Johnson, and Ghusn; Structural Engineers
Jeff Brewer	American Red Cross, Southern Nevada Chapter
Ian Buckle	University of Nevada, Reno – Center for Civil Engineering Earthquake Research
Wayne Carlson	Nevada Public Agency Insurance Pool
Joe Curtis	Storey County Emergency Manager
Craig dePolo	Nevada Bureau of Mines and Geology

Jenelle Hopkins	Clark County School District, Las Vegas
Eric Hubbard	Engineering Geologist; Member-at-Large
Graham Kent	Nevada Seismological Laboratory
Steve Koenig	City Center, Las Vegas
Ron Lynn	Clark County Bldg. Dept.
Jim O'Donnell	Geophys.Contractor, Boulder City; Member-at-Large
Jim Reagan	NV Energy
Woody Savage	U.S. Geological Survey (retired)
Wanda Taylor	UNLV Department of Geoscience
Jim Walker	Nevada Department of Transportation
Jim Werle	Converse Consultants

B.2 STATE, COUNTY, TRIBAL EMERGENCY MANAGERS

Emergency Manager's List

(Revised 7/19/2013)
http://dem.nv.gov/uploadedFiles/demnvgov/content/Contact_Us/EmergencyManagersList.pdf
*All area codes are 775 unless otherwise shown

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after 5/Wkds

Duty Officer Office Hours 687-0300
After Hrs/NHP Dispatch 687-0400

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City website: http://www.bcnv.org/

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Email: lwerner@carson.org — 887-2286 Fax

Kenneth Furlong, Sheriff — 887-2500 Office
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City website: www.carson.org

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County website www.churchillcounty.org

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Chairman: Ed Naranjo

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Chairman: Maxine Smart - Acting

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Chairman: Len George

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Chairperson: Mervin Wright

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Reno, NV 89505 334-3826 Fax
Email: MunnsS@reno.gov

Andrew Clinger, City Manager 334-2401 Office
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N. David Hunkup, Emergency Services Manager
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Chairman: Arlan D. Melendez

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Virginia City, NV 89440 742-0138 Cell
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SUMMIT LAKE PAIUTE TRIBE

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(Texas - then insert Sat phone number 8816 3158 0190

Chairman: Randi DeSoto
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INTER-TRIBAL EMERGENCY RESPONSE COMMISSION (ITERC)

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WASHOE COUNTY

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Mike Haley, County Sheriff
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WASHOE TRIBE OF NV AND CA

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Chairperson: Darrel Kizer
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265-8600

WEST WENDOVER

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YERINGTON PAIUTE TRIBE

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B.3 Wildland Urban Interface Fire Summit 2013 Planning Group

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B.4. STATE TECHNICAL ASSISTANCE RESPONSE TEAM (START) MEMBERS

Last	First	Department/Organization
Ashby	Elizabeth	Division of Emergency Management
Hunt	Tim	Nevada Division of Wildlife
Davidow	Clifford	State Public Works
DePolo	Craig	Nevada Bureau of Mines and Geology
Dumond	Andy	Clear Result Consulting
Ely	Dennis	Department of Public Safety/Fire Marshal
Gillard	Ben J.	Department of Business and Industry-Insurance
Gouveia	Kevin	Architect
Gould	John	Department of Public Safety / Parole & Probation
Davis	Kim	Department of Conservation and Natural Resources
Kenneson	Al	Northern Nevada Mental Health Services
Hood	Ron	Division of Emergency Management
Humphrey	Dennis	Administration
Johnson	Karen	Division of Emergency Management
Kolpak	Mike	Department of Public Safety/Fire Marshal
Kelly	Tami	State Public Works Board
Kuckenmeister	Michael	Purchasing and Contract Specialist
Lavigne	Randy	American Institute of Architects
Lemaire	Jim	Department of Information Technology
Macias	Larry	American Institute of Architects
Magenheimer	Chris	North Lake Tahoe Fire Protection District
Manning	Bruce	Department of Motor Vehicles
Lucido	Connie	Division of Emergency Management
Martin	Rick	Division of Emergency Management
Martinez	Robert	Department of Conservation & Natural Resources
Maguire	Paul	Public Utilities Commission
Mayberry	Mike	Department of Transportation
Nipp	Mark	State Public Works Board
Nolan	Dennis	State Public Works Board
Opperman	P.Luke	Department of Conservation and Natural Resources
Osborne	Austin	Storey County
Powell	Gail	Division of Emergency Management
Shehorn	Michael	State Public Works Board
Severns	David	Department of Transportation
Smith	Chris	Washoe County School District
Snyder	Mike	State Public Works Board
Tiearney	Joan	Risk Management
Toulouse	Kim	Department of Wildlife
Tune	Otto	Division of Emergency Management
Watermolen	John	Division of Forestry
Schmick	Robert	Department of Public Safety/Records and Technology
Smith	Chris	Division of Emergency Management

Tedesco	Barry	American Institute of Architects
Theodorou	Dmitri	Clark County School District
Van Cleemput	Bruce	Division of Emergency Management

B.5. Nevada Living With Fire Program Cooperating Partners

- United States Forest Service – Humboldt Toiyabe National Forest: http://www.fs.usda.gov/htnf
- United States Forest Service – Lake Tahoe Basin Management Unit: http://www.fs.usda.gov/main/ltbmu/
- United States Department of Interior, Bureau of Land Management: www.blm.gov/nv
- Nevada Association of Counties (NACO) : http://www.nvnaco.org/NACo
- Nevada Insurance Council (NIC) : http://www.nevadainsurancecouncil.com/
- Sierra Front Wildfire Cooperators (SFWC) http://www.sierrafront.net/
- Nevada Division of Forestry: http://forestry.nv.gov/
- University of Nevada Cooperative Extension: http://www.unce.unr.edu/
- Sierra Fire Protection District: http://www.washoecounty.us/clerks/sffpd_minutes.php
- Insurance Industry Partners:
- Nevada Insurance Council

B.6. Silver Jackets Program

Silver Jackets is an innovative State, federal, tribal and local interagency program that works together to reduce flood risk. It serves as a catalyst to develop comprehensive and sustainable solutions to flood hazard issues including mitigation planning, flood hazard mapping risk reduction, response and recovery planning. Website: www.nfrmp.us/state/factNevada.cfm

Current Participating Agencies:

Nevada Division of Water Resources (NDWR)
Nevada Department of Public Safety (NDPS)
National Oceanic and Atmospheric Administration (NOAA)

Federal Emergency Management Agency (FEMA)
USDA Natural Resources Conservation Service (NCRS)
U.S. Geological Survey Water Resources Division (USGS WRD)
U.S. Army Corps of Engineers (USACE)

B.7. Hazard Mitigation Public Awareness and Outreach Activities to Other Groups

The hazard mitigation planning committee and subcommittee members provide information on mitigation activities at meetings with members of NHMPC and Planning Subcommittee, staff, the public and other organizations, etc. speaking about the planning process and offering information about how to provide input. Table B-1 below shows some of the presentations made by committee members to other groups promoting hazard mitigation program and activities.

Table B-1. Presentations to Other Groups					
Date	**Location**	**Speaker/ Subcommittee/Committee Member Name(s)**	**Organization/ Audience**	**Activity/Presentation**	**Approximate number of people in the group addressed; notes**
July 9, 2010	Lake Tahoe	Marie Holt, Rajat Jain, Maria Dias	UNCE Living With Fire /Wildland Fire Interface (WUI) summit participants including homeowners and emergency personnel	Rates, Claims and Availability - Insurance information you need to know when faced with wildfire threat	
September 1, 2010	Lake Tahoe	Marie Holt and Rajat Jain	CA and NV Fire Safe Council/Homeowners from CA and NV, emergency personnel, insurance industry representatives.	Rates, Claims and Coverage Availability - When disasters occur: How will your insurance policy respond in your time of need?	

Table B-1. Presentations to Other Groups					
Date	**Location**	**Speaker/ Subcommittee/Committee Member Name(s)**	**Organization/ Audience**	**Activity/Presentation**	**Approximate number of people in the group addressed; notes**
September 20, 2010	Reno	Marie Holt and Rajat Jain	UNCE Living With Fire /Wildland Fire Interface (WUI) summit participants including homeowners and emergency personnel	Rates, Claims and Coverage Availability - When disasters occur: How will your insurance policy respond in your time of need?	
November 4, 2010	Reno	Brett Barratt, Rajat Jain, Maria Dias	Northern Nevada Claims Association/Insurance adjusters, Agents, professionals	Claims in Nevada - A Regulatory Perspective	
March 1, 2011	Ely and White Pine County	P. Luke Opperman	Community Officials, Building Inspectors/ NDWR Floodplain Management Program as CTP with FEMA	Review new FEMA Flood Maps, host Public Meetings, Mailers to residents	

Table B-1. Presentations to Other Groups					
Date	**Location**	**Speaker/ Subcommittee/Committee Member Name(s)**	**Organization/ Audience**	**Activity/Presentation**	**Approximate number of people in the group addressed; notes**
July 1, 2011	Eureka and Eureka County	P. Luke Opperman	Community Officials, and Public/ NDWR Floodplain Management Program as CTP with FEMA	Review new FEMA Flood Maps, host 2 Public Meetings, Mailers to residents	
September 1, 2011	Hawthorne and Mineral County	P. Luke Opperman	County Officials and County Commissioners/ NDWR Floodplain Management Program as CTP with FEMA	Review new FEMA Flood Maps, present mitigation ideas	
September 20, 2011	Reno	Rajat Jain	UNCE Living With Fire/Wildland Fire Interface (WUI) summit participants including homeowners and emergency personnel.	When disasters occur: How will your insurance policy respond in your time of need?	An Arizona State Senator specifically extended her stay for this presentation in light of wildfires and floods in Arizona in 2011.

Table B-1. Presentations to Other Groups					
Date	**Location**	**Speaker/ Subcommittee/Committee Member Name(s)**	**Organization/ Audience**	**Activity/Presentation**	**Approximate number of people in the group addressed; notes**
January 26, 2012	Pleasant Valley Elementary School	Marie Holt, Rajat Jain and Jake Sunderland	UNCE - Post Washoe Drive Fire Community Event/Homeowners adversely impacted by Washoe Drive fire of January 19, 2012; NV DEM, Washoe County Sheriff's Office, Reno;Washoe Fire Department; media	Recover, Rebuild, Restore - Moving Forward	
February 17, 2012	Carson City	Marie Holt and Rajat Jain	NV Division of Insurance/DOI employees	Emergency Preparedness and Disaster Response - Role of ESF-14 and DOI Business Continuity Plan	

Table B-1. Presentations to Other Groups					
Date	**Location**	**Speaker/ Subcommittee/Committee Member Name(s)**	**Organization/ Audience**	**Activity/Presentation**	**Approximate number of people in the group addressed; notes**
March 1, 2012	Carson City	P. Luke Opperman	Community Officials, and Public/ NDWR Floodplain Management Program as CTP with FEMA	Review revised FEMA Flood Maps, Public Meetings, Mailers to residents	
April 28, 2012	Carson City	Marie Holt and Rajat Jain	Wildfire Awareness Week (UNCE)/Homeowners; consumers	Insurance information booth	
May 8, 2012	Carson City	Rajat Jain, Jake Sunderland, Gennady Stolyarov	City of Carson/Homeowners	Information on flood insurance (booth)	
May 17, 2012	Reno	Marie Holt and Rajat Jain	LP Insurance Services/Risk Manager; company executives from local Reno businesses	Claims in Nevada - A regulatory Perspective	
May 17, 2012	Virginia Highlands (Fire Station 2)	Marie Holt and Rajat Jain	Storey County FD/homeowners;consumers; emergency personnel	When disasters occur: How will your insurance policy respond in your time of need?	

Table B-1. Presentations to Other Groups					
Date	**Location**	**Speaker/ Subcommittee/Committee Member Name(s)**	**Organization/ Audience**	**Activity/Presentation**	**Approximate number of people in the group addressed; notes**
June 4, 2012	City of Las Vegas/Clark County	Rick Diebold	Four Square	Non Structural Mitigation Presentation	
June 14, 2012	Reno	Marie Holt and Rajat Jain	Caughlin Ranch Homeowners Association/homeowners; consumers; fire dept.; City of Reno	When disasters occur: How will your insurance policy respond in your time of need?	
June 14, 2012	City of Las Vegas/Clark County	Rick Diebold	LDS- Palo Alto	Non Structural Mitigation Presentation	
June 15, 2012	Carson City	Rajat Jain	NV Division of Insurance/NDOI employees	When disasters occur: How will your insurance policy respond in your time of need?	
June 21, 2012	City of Las Vegas/Clark County	Rick Diebold	LDS Palo Alto	Structural Mitigation Presentation	

Table B-1. Presentations to Other Groups					
Date	**Location**	**Speaker/ Subcommittee/Committee Member Name(s)**	**Organization/ Audience**	**Activity/Presentation**	**Approximate number of people in the group addressed; notes**
July 1, 2012	Battle Mountain, Lander County	P. Luke Opperman	Community Officials, County Commissioners, and Public/ NDWR Floodplain Management Program as CTP with FEMA	Review new FEMA Flood Maps, Public Meeting, Mailers to residents	
July 2, 2012	City of Las Vegas/Clark County	Rick Diebold	Four Square	Structural Mitigation Presentation	
August 1, 2012	Minden and Douglas County	P. Luke Opperman	Community Officials, and Public/ NDWR Floodplain Management Program as CTP with FEMA	Review revised FEMA Flood Maps, Public Meetings, Mailers to residents	
August 4, 2012	City of Las Vegas/Clark County	Rick Diebold	SITEL	Non Structural Mitigation Presentation	
August 8, 2012	City of Las Vegas/Clark County	Rick Diebold	Community	Non Structural Mitigation Presentation	

Table B-1. Presentations to Other Groups					
Date	**Location**	**Speaker/ Subcommittee/Committee Member Name(s)**	**Organization/ Audience**	**Activity/Presentation**	**Approximate number of people in the group addressed; notes**
August 11, 2012	City of Las Vegas/Clark County	Rick Diebold	SITEL	Structural Mitigation Presentation	
August 23, 2012	Gardnerville	Rajat Jain	Douglas County; homeowners	Information on flood insurance map revisions	
August 29, 2012	City of Las Vegas/Clark County	Rick Diebold	Community	Structural Mitigation Presentation	
September 1, 2012	Pahrump and Nye County	P. Luke Opperman	Community Officials, County Commissioners, and Public/ NDWR Floodplain Management Program as CTP with FEMA	Review revised FEMA Flood Maps, Public Meetings, Mailers to residents	
September 4, 2012	City of Las Vegas/Clark County	Rick Diebold	METRO Police Dept.	Non Structural Mitigation Presentation	
September 10, 2012	City of Las Vegas/Clark County	Rick Diebold	City of Henderson	Non Structural Mitigation Presentation	

Table B-1. Presentations to Other Groups					
Date	**Location**	**Speaker/ Subcommittee/Committee Member Name(s)**	**Organization/ Audience**	**Activity/Presentation**	**Approximate number of people in the group addressed; notes**
September 12, 2012	City of Las Vegas/Clark County	Rick Diebold	City of Henderson	Non Structural Mitigation Presentation	
September 13, 2012	City of Las Vegas/Clark County	Rick Diebold	North Las Vegas	Non Structural Mitigation Presentation	
October 1, 2012	Reno	Rajat Jain	UNCE Living With Fire/Wildland Fire Interface (WUI) summit participants including homeowners and emergency personnel	When disasters occur: How will your insurance policy respond in your time of need?	
October 1, 2012	City of Las Vegas/Clark County	Rick Diebold	City of Henderson	Structural Mitigation Presentation	
October 2, 2012	City of Las Vegas/Clark County	Rick Diebold	METRO Police Dept.	Structural Mitigation Presentation	
October 10, 2012	City of Las Vegas/Clark County	Rick Diebold	City of Henderson	Structural Mitigation Presentation	
October 11, 2012	City of Las Vegas/Clark County	Rick Diebold	North Las Vegas	Structural Mitigation Presentation	

Table B-1. Presentations to Other Groups					
Date	**Location**	**Speaker/ Subcommittee/Committee Member Name(s)**	**Organization/ Audience**	**Activity/Presentation**	**Approximate number of people in the group addressed; notes**
October 22, 2012	City of Las Vegas/Clark County	Rick Diebold	St Jude Ranch	Non Structural Mitigation Presentation	
October 24, 2012	Carson City	Rajat Jain	Division of Water Resources Floodplain Management Conference/floodplain managers	Insurance Regulation in Nevada	
October 25, 2012	City of Las Vegas/Clark County	Rick Diebold	St Jude Ranch	Structural Mitigation Presentation	
November 1, 2012	City of Las Vegas/Clark County	Rick Diebold	North Las Vegas	Non Structural Mitigation Presentation	
November 2, 2012	City of Las Vegas/Clark County	Rick Diebold	Southwest Technical Academy	Non Structural Mitigation Presentation	
November 3, 2012	City of Las Vegas/Clark County	Rick Diebold	Southwest Technical Academy	Structural Mitigation Presentation	

Table B-1. Presentations to Other Groups					
Date	**Location**	**Speaker/ Subcommittee/Committee Member Name(s)**	**Organization/ Audience**	**Activity/Presentation**	**Approximate number of people in the group addressed; notes**
November 5, 2012	City of Las Vegas/Clark County	Rick Diebold	City of Henderson	Non Structural Mitigation Presentation	
December 1, 2012	City of Las Vegas/Clark County	Rick Diebold	North Las Vegas	Structural Mitigation Presentation	
December 1, 2012	City of Las Vegas/Clark County	Rick Diebold	LVFTC - Community	Non Structural Mitigation Presentation	
December 3, 2012	City of Las Vegas/Clark County	Rick Diebold	City of Henderson	Structural Mitigation Presentation	
December 8, 2012	City of Las Vegas/Clark County	Rick Diebold	LVFTC - Community	Structural Mitigation Presentation	
January 15, 2013	City of Las Vegas/Clark County	Rick Diebold	Church of Christ	Non Structural Mitigation Presentation	
January 24, 2013	City of Las Vegas/Clark County	Rick Diebold	North Las Vegas	Non Structural Mitigation Presentation	
February 1, 2013	City of Las Vegas/Clark County	Rick Diebold	Church of Christ	Structural Mitigation Presentation	

Table B-1. Presentations to Other Groups					
Date	**Location**	**Speaker/ Subcommittee/Committee Member Name(s)**	**Organization/ Audience**	**Activity/Presentation**	**Approximate number of people in the group addressed; notes**
February 21, 2013	City of Las Vegas/Clark County	Rick Diebold	North Las Vegas	Structural Mitigation Presentation	
February 26, 2013	City of Las Vegas/Clark County	Rick Diebold	7th Day	Non Structural Mitigation Presentation	
March 6, 2013	City of Las Vegas/Clark County	Rick Diebold	City of Henderson	Non Structural Mitigation Presentation	
March 11, 2013	City of Las Vegas/Clark County	Rick Diebold	Pahrump	Structural Mitigation Presentation	
March 15, 2013	City of Las Vegas/Clark County	Rick Diebold	Sun City Summerlin	Non Structural Mitigation Presentation	
March 16, 2013	City of Las Vegas/Clark County	Rick Diebold	Preppers	Non Structural Mitigation Presentation	
March 22, 2013	City of Las Vegas/Clark County	Rick Diebold	Sun City Summerlin	Structural Mitigation Presentation	
March 23, 2013	City of Las Vegas/Clark County	Rick Diebold	Preppers	Structural Mitigation Presentation	

Table B-1. Presentations to Other Groups					
Date	**Location**	**Speaker/ Subcommittee/Committee Member Name(s)**	**Organization/ Audience**	**Activity/Presentation**	**Approximate number of people in the group addressed; notes**
March 26, 2013	City of Las Vegas/Clark County	Rick Diebold	7th Day	Structural Mitigation Presentation	
April 3, 2013	City of Las Vegas/Clark County	Rick Diebold	City of Henderson	Structural Mitigation Presentation	
April 4, 2013	City of Las Vegas/Clark County	Rick Diebold	North Las Vegas	Non Structural Mitigation Presentation	
May 2, 2013	City of Las Vegas/Clark County	Rick Diebold	North Las Vegas	Structural Mitigation Presentation	
June 1, 2013	City of Las Vegas/Clark County	Rick Diebold	Down Town Rangers	Non Structural Mitigation Presentation	
June 2, 2013	City of Las Vegas/Clark County	Rick Diebold	Down Town Rangers	Structural Mitigation Presentation	
February 15, 2013	City of Las Vegas/Clark County	Rick Diebold	Pahrump	Non Structural Mitigation Presentation	
April 16,2013	City of Las Vegas/Clark County	Rick Diebold	LDS - Alexander	Non Structural Mitigation Presentation	

Table B-1. Presentations to Other Groups					
Date	**Location**	**Speaker/ Subcommittee/Committee Member Name(s)**	**Organization/ Audience**	**Activity/Presentation**	**Approximate number of people in the group addressed; notes**
April 27,2013	City of Las Vegas/Clark County	Rick Diebold	LDS - Alexander	Structural Mitigation Presentation	

Nevada Hazard Mitigation Planning Committee (NHMPC)

Nevada Hazard Mitigation Planning Subcommittee

Bylaws of the Nevada Hazard Mitigation Planning Committee

The advisory body, known as Nevada Hazard Mitigation Planning Committee (NHMPC) was formed July 21, 2003, to advise the Nevada Division of Emergency Management (NDEM) concerning hazard mitigation planning, activities and policies.

Nevada Hazard Mitigation Planning Committee Board of Directors and their agencies are listed below.

NHMPC Board of Directors

Member	Agency
Craig dePolo - Chair	Nevada Bureau of Mines and Geology
Rick Diebold - Vice Chair	Las Vegas Office of Emergency Management
Ed Atwell	Washoe County Emergency Management
Joe Curtis	Storey County Emergency Management
Robert D. Fellows	Carson City Public Works – Floodplain Manager
Andrew Trelease	Clark County Regional Flood Control District
James Walker	Nevada Department of Transportation, NDOT, Maintenance and Operations Division
Ron Lynn	Nevada Earthquake Safety Council Clark County Department of Development Services, Building Division
Jim Reagan	NV Energy, Emergency Management- Private Sector
Terri Garside	Member of the Public
Vacant	Nevada Department of Conservation and Natural Resources/Division of Forestry
Vacant	Nevada Department of Conservation and Natural Resources/Division of Water Resources
Elizabeth Ashby (Advisory Only)	Nevada Division of Emergency Management (at Large (private sector or governmental agency)

The planning process for the 2010 update was started in January 4, 2007. The NHMPC formed a Planning Subcommittee to update the NHMP, as required by the DMA 2000 and its implementing regulations. The members of the Subcommittee and their agencies are listed below.

NHMPC Planning Subcommittee Members

Name	Agency
James Walker – Chair	Nevada Department of Transportation, NDOT, Maintenance and Operations Division
Elizabeth Ashby (Advisory Only)	Nevada Division of Emergency Management
Marie Barry	Washoe Tribe
Peter Mulvihill	State Fire Marshall
Luke Opperman	Nevada Division of Water Resources
Scott Rasmussen	Nevada Division of Forestry
Robin Palmer	Nevada Dept of Conservation and Natural Resources
Craig dePolo	Nevada Bureau of Mines and Geology
Mike Rife/Branden Pearson	State Public Works Board
Keith Forbes	Nevada Department of Agriculture
Stacey Giomi	Carson City Fire Department, Fire Chief
Bill Elliott	Nevada Division of Emergency Management
Juliette Hayes	FEMA Region IX HazMit Specialist
Karen Johnson (Advisory Only)	Nevada Division of Emergency Management (at Large (private sector or governmental agency)
David Gould	Dept. of Administration/Division of Risk Mgmt
Rajat Jain	Nevada Division of Insurance
Daphne D. LaPointe (Advisory Only)	Nevada Bureau of Mines and Geology
Angela Krutsinger	Nevada State Hospital Association
Robert Martinez	Nevada Division of Water Resources
Rhett Milne	National Weather Service/Reno
Vacant	State Historical Preservation Office

NEVADA HAZARD MITIGATION PLANNING COMMITTEE
BYLAWS

I. Authority

The Nevada Hazard Mitigation Planning Committee ("Committee") was established through the authority contained in Nevada Revised Statutes ("NRS") Chapter 414, which authorizes the Chief of the Nevada Division of Emergency Management ("NDEM") to carry out the emergency management program for the State of Nevada.

II. Purpose and Mission

The purpose of the Committee is to advise the NDEM concerning hazard mitigation assistance ("HMA"), which includes planning, projects, and policies. All hazards, including natural and man-made, may be considered, and the Committee should adhere to the State Hazard Mitigation Plan prepared in accordance with the federal Disaster Mitigation Act of 2000. Specific charges to the Committee are to:

1. Implement the State Hazard Mitigation Plan, through the following actions:

    a. Encourage local and region, multi-jurisdictional governmental agencies and the private sector to prepare their own hazard mitigation plans;
    b. Initiate the preparation of appropriate proposals from state agencies and encourage local and regional, multi-jurisdictional governmental agencies to submit proposals for HMA in Nevada;
    c. Review proposals submitted for HMA and make recommendations to NDEM for priorities for funding;
    d. Assist NDEM in the preparation of formed proposals to FEMA for HMA;
    e. Promote activities that contribute toward building disaster-resistant communities throughout Nevada; and
    f. Assess risks from natural hazards in Nevada, and use risk assessments in the development of Hazard Mitigation Plans and in the evaluation of proposals for HMA.

2. Review and revise the State Hazard Mitigation Plan, as required by federal law or as needed.

III. Membership

Committee members will serve a three (3) year term. There is no limit to the number of terms a member can serve on the Committee.

Members will be appointed by, and serve at the pleasure of, the Chief of NDEM. The Chief will appoint membership to meet the following minimum representation:

1. The Nevada State Hazard Mitigation Officer;
2. Emergency Management in Clark County or any incorporated city or agency within the county;
3. Emergency Management in Washoe County or any incorporated city or agency within the county;
4. Emergency Management from a rural county or any incorporated city within a rural county in Nevada;
5. Any local or multi-jurisdictional agency within Nevada;
6. Floodplain Management, either local or multi-jurisdictional, in Northern Nevada;
7. Floodplain Management, either local or multi-jurisdictional, in Southern Nevada;
8. Nevada Bureau of Mines and Geology;
9. Nevada Department of Conservation and Natural Resources/Division of Forestry;
10. Nevada Department of Conservation and Natural Resources/Division of Water Resources;
11. Nevada Department of Transportation;
12. Nevada Earthquake Safety Council;
13. Private Sector; and
14. A member of the public.

All Members are expected to attend every Committee meeting in person, via teleconference, or via video conference. If a Member is unable to attend three consecutive meetings, the Chief of NDEM will conduct appropriate membership actions, up to and including, removal from the Committee.

VI. Officers and Duties

The Officers of the Committee shall consist of the Chair and Vice Chair.

a) Chair – The Chair is elected by the membership of the Committee. The Chair will serve a one year term starting on January 1st. The Chair is the leader of the Committee and will be the presiding officer at all of the meetings.

The Chair shall provide reports to the Chief of NDEM on or before June 30 and December 31 of each year detailing the activities of the Committee.

b) Vice Chair – The Vice Chair is elected by the membership of the Committee. The Vice Chair will serve a one year term starting on January 1st. The Vice Chair will automatically assume the position of Chair of the Committee for a one year term at the expiration of the Chair's term on December 31st.

In the absence of the Chair, the Vice Chair will assume the responsibilities of the Chair.

In the event that both the Chair and the Vice-Chair are unable to perform their duties, the Chief of NDEM will appoint an Interim Chair.

There is no limit to the number of terms that a member can serve as the Chair or Vice Chair. Only members of the Committee are eligible to serve as the Chair or Vice Chair of the Committee.

V. Meetings

Committee meetings will be called quarterly. Special meetings of the Committee may be called by the NDEM, the Chair of the Committee or the Vice Chair of the Committee.

All committee meetings are subject to the Nevada Open Meeting Law contained in Chapter 241 of the Nevada Revised Statutes.

VI. Subcommittees

Subcommittees may be established during a Committee meeting by the Chair, or the Vice Chair if the Chair is not available, to assist with the business of the Committee. The Chair will appoint a Subcommittee Chair from the Committee membership. Members of the subcommittee are not required to be members of the Committee. An appointment to a subcommittee may be made by the Chair, by the Vice-Chair if the Chair is not available, or by majority vote of the Members. All subcommittees will provide quarterly status reports to the Chair.

Subcommittee meetings are subject to the Nevada Open Meeting Law contained in Chapter 241 of the Nevada Revised Statutes.

VII. Voting

A simple majority of voting members constitutes a quorum for the transaction of business pursuant to the Nevada Open Meeting Law.

Proxies are not recognized by the Nevada Open Meeting Law. Proxies do not count towards quorum and cannot vote.

VIII. Administrative Support

The Chief of NDEM will appoint a Secretary to the Committee. Non members of the Committee are eligible to be appointed as the Secretary. The Secretary will be responsible for maintaining the current membership list, the attendance records of the Members, and the distribution of the Committee agendas to the Committee members and other individuals who specifically request notification of meetings.

The Nevada Division of Emergency Management shall provide administrative support to the Committee.

IX. Adoption and Amendment to the Bylaws

The Bylaws shall be adopted by a majority vote of the Members present at a Committee meeting, with the approval of the Chief of NDEM.

The Bylaws may be amended by a majority vote of the Members present at a Committee meeting, with the approval of the Chief of NDEM.

These Bylaws were adopted by the Nevada Hazard Mitigation Planning Committee on _____, 2012, by majority vote of the Committee.

7/18/12

Craig DePolo, Chair Date

7/23/12

Christopher B. Smith, Chief of NDEM Date

Agenda
Nevada Hazard Mitigation Planning Committee
PLANNING SUBCOMMITTEE
Monday, January 24, 2011, 1:30 pm
Division of Emergency Management
Executive Conference Room
2478 Fairview Drive DIAL-IN INFORMATION:
Carson City, NV 89701 DIAL-IN #: 1-888-273-3658
PASS CODE: 8743295

A. WELCOME AND INTRODUCTIONS- *Chair, Jim Walker*

B. (*)**APPROVAL OF MINUTES (action)**: July 26, 2010

C. **UPDATE OF THE STATE HAZARD MITIGATION PLAN,** *Chair, Jim Walker*
a. Report to the Subcommittee regarding the FEMA Enhanced plan requirements
b. Review Annual Plan Maintenance Worksheet – Requesting information about accomplished mitigation projects supported, facilitated and/or funded through/by other state agencies using Figure 6-4 Mitigation Activity/Project Report
c. Review FEMA comments from review of the 2010 updated version of the plan:
1. Crosswalk for standard plan
2. Crosswalk for enhanced plan
d. Inclusion of Climate Change into each hazard profile in the 2013 update
e. Communication towers - location of towers and mitigation activities proposed and ongoing, *Pat Sheehan, DoIT*
f. MyPlan Website project description and guidance about its access

D. PUBLIC COMMENT PERIOD
a. Please note the public is welcome to attend the meeting. Members of the public may bring matters not appearing on the meeting agenda to the attention of the Committee. However, the Committee may discuss the matter when it is brought up, but no action may be taken until it has been included on a future agenda as an action item.

E. ANNOUNCEMENT OF TENTATIVE FUTURE MEETINGS
Meetings are scheduled the last Monday of the first month in the calendar quarter at 1:30 pm.
a. April 25, 2011
b. July 25, 2011
c. October 31, 2011

F. **ADJOURN**
The Committee may take action on items marked by an asterisk (*). Items may be taken out of order presented on the agenda at the
discretion of the chairperson.
This is a public meeting. In conformance with the Nevada Public Meeting law, I Elizabeth Ashby, posted or caused the posting of this
agenda on or before Tuesday, January 18, 2011, 9:00 a.m. at the following locations:
Nevada Division of Emergency Management (Carson City)
Nevada Bureau of Mines and Geology (Reno)
Clark County Department of Buildings Russell/Cameron Office, Las Vegas
And on the website for the Nevada Hazard Mitigation Planning Committee at
http://www.nbmg.unr.edu/nhmpc/nhmpc.htm
For further information please contact Jonathan G. Price, State Geologist and Director, Nevada Bureau of Mines and Geology by email

at jprice@unr.edu or telephone (775) 784-6691 extension 5.
We are pleased to make reasonable accommodations for members of the public who are disabled. If special arrangements are
necessary, please notify the Committee at (775) 687-0314. Twenty-four hours advance notice is requested.

MINUTES
Nevada Hazard Mitigation Planning Committee
PLANNING SUBCOMMITTEE MEETING
Monday, January 24, 2011, 1:30 pm
Division of Emergency Management
Executive Conference Room
2478 Fairview Drive
Carson City, NV 89701

A. Welcome and introductions- in the absence of chair, Jim Walker, Jon Price chaired the meeting and opened with a welcome and attendees introduced themselves. In attendance were:

Elizabeth Ashby	NDEM
Rick Diebold	LVOEM
Mike Dondero	NDF
Stacey Giomi	CCFD
Kim Groenewold	NDWR
Daphne LaPointe	NBMG
Maureen Martinez	NDRM
Robert Martinez	NDWR
Robin Palmer	NDCNR
Jon Price	NBMG
Patrick Sheehan	DoIT
Rhett Milne	National Weather Service

Jon moved item Cc – a description of the state's communication towers, to the top of the meeting agenda to allow the DoIT (Dept. of Information Technology) staff to present their report and leave early.
Cc. Pat Sheehan briefly described the communication tower network serving the State of Nevada, specifically:

NDOT
NHP
radio towers
all radio traffic
microwaves & fiber-optics
serves as the OC3 backbone
there are 106 sites – 50 mountaintop and 56 spur sites
DS0 (64 kb) and
DS1 (1.5 MB)

There are redundant power systems at all sites consisting of:

- Solar power
- DC plant

- AC plant
- Propane generators (500- or 2000-gals, self-delivered by truck or cats)

They are designed to be redundant and there is no commercial power used at these sites because we cannot afford to have them go down. They could run a week or so. So far they have limited Ethernet capability but are increasing this to suit customers. Sites have both microwave and fiber optic communications systems. Loop protection feature allows one site to go down as an isolated site without affecting other sites. Some equipment is leased while some sites in remote locations are owned. The network runs a full OC3 backbone with spurs off the main loop that handle the 16 Tees. It's currently running a little low on capacity.

Typical site hazards include:

- Wildfire
- Earthquakes
- Landslides
- Lightning
- Wind
- Ice

Wildfires -So far there has been no damage to the communications sites by wildfires (located generally on rocky, barren sites so there's not much fire threat)
There are 13 staff members to maintain all 106 sites and if there is an accessibility problem, they hire a temporary crew to clear brush. Most sites are accessible to the general public and located on public lands; access control is implemented in some areas. Some have video surveillance.
Earthquakes – all sites are engineered for Zone 3 – bolted to floor and rack-braced
Floods - not generally a problem since most are located on mountaintops, although a few low-lying urban/rural sites have been damaged in floods.
Landslides – most sites are not impacted although there could be some potential if located on the edge of a steep area – not generally a concern although they could take out a service road.
Weather-related factors of lightning, wind, and ice are the biggest threats to the communications sites and pose the highest susceptibility to damage (e.g. in 2007 a lightning strike took the Pinegrove site out completely; it took 24 hours to get it back online).
Site grounding is important to dissipate energy.
Ice shields are essential hardware mounted over microwaves to prevent damage.
A regular scheduled maintenance regimen of secured hardware checks is important. Squaw Peak above Ely is one of the worst to be often hit by lightning. The Mount Wilson site near Pioche suffered $146,355 in winter storm damage in 2004-2005.
Q. Are these IT damages eligible for assistance?
A. if outside the budgeted amount, yes – claims are filed through Risk management. Eligible under NAC 414, but no money in it. Last year high winds damaged 6 sites and DEM helped contractors reach the sites for repairs.
Q. Can State aircraft be used?
A. Yes, used to transport test equipment.

Q. Lightning, wind, ice… NDF, State, National Guard, - are there cost-effective activities we can do?
A. Yes, adding ice shields to more sites.
Q. Wildfire?
A. Access to crews to clear weeds and brush from sites…Identify possible sites prone to wildfire damage, fuel-reduction projects. Railroad land? – most sites are on federal land, and privatized sites on federal land etc., BLM, USFS – factor in construction of a helispot to land in.
Pat was thanked by the subcommittee for his report, and he left the meeting.

B. Minutes of the July 26, 2010 meeting were read, amended slightly, a motion to approve as amended was made by Rob, seconded by Rick and the minutes were approved as amended.

Elizabeth noted that FEMA requires the states to maintain quality application reports management and brought California- Region 9's as an example, and requested that we do the same for Nevada, and that the Subcommittee members please comment by the next meeting.

Here Jon moved up Agenda item Cd. "Inclusion of Climate Change into each hazard profile in the 2013 update" so that Rhett Milne from the NWS could present his report.

Cd. Based on a comment from FEMA, Rhett Milne asked for a move that we include Climate Change in the next iteration of the Hazard Mitigation Plan. To support this, he reported that the top 5 effects of climate change on hazards are as follows:

1. Higher snow levels resulting in more flooding, especially river flooding
2. Shorter winter seasons, resulting in longer duration of wildfire seasons
3. More intense and prolonged drought, resulting in more severe wildfire seasons
4. Less snowpack resulting in earlier runoff and water shortages
5. More extreme heat waves (120- degree to 125-degree days) resulting in longer and more intense wildfire seasons

The Subcommittee discussed whether in the next iteration of the plan we should decide to investigate, consider, and include if and how climate change affects each hazard.
Questions that should be addressed: Are there any numerical quantifications we can include? Some subcommittee members say no. Some say we must consider county versus city versus state issues and their differing modes of dealing with this. DRI has some research on it we could include – with possible quantification. NWS has maps it could provide that we can use as appendices. Flash-flooding is often more of a hazard in Nevada and is less predictable than riverine flooding.
Jon Price mentioned that CA is gearing up for activity using something called ARCSTORM; maybe we can get info about this scenario (a "worst-case-scenario-1000-year-storm" concept). Elizabeth said she would talk to her CA counterpart to get more information on this for us. Rob Palmer asked if NWS projects impact dams. Rhett said no; Rob Martinez said he has that information if it is needed.

In summation, Elizabeth asked for a motion.
Stacey Giomi moved that we do address and include climate change in all pertinent sections of the next iteration (2013) of the NHMP. Mike Dondero seconded the motion, a voice vote was taken and the motion passed. Rhett Milne was thanked for his input and he left the meeting.

Cb. Hazard Mitigation Plan Maintenance Worksheet.
Elizabeth asked all Subcommittee members to itemize and list all mitigation-related projects or plans (local, state, or county level), and bring the listing to each meeting. Elizabeth began by filling in her know NDEM projects as an example. There was discussion among Subcommittee members as to what should and should not be included here.

Cc. Addressing of Crosswalk Review Comments.

Standard Plan Crosswalk review comments:
1. Add paragraph describing how each Subcommittee's reports and minutes are posted. –Will do.
2. Climate Change – already addressed by report from NWS and the motion – we will add paragraphs based on how each hazard may be affected by climate change where pertinent.
3. Update CWPP – Stacey Giomi is addressing this
   WUI – will fix this
   Trends relative to land-use planning? Stacey is in the process of doing this – NAC 477 code – will adopt IFC WUI code – brand new
   NEQSC guidelines for fault-fissure invests with respect to zoning – basically "Don't build on faults."
   5.3.3 – Prioritization of highest risk communities? This was discussed and agreed that it needs further discussion as the 2013 update progresses.

Enhanced Plan Crosswalk review comments:
1. Include the Adoption resolution
2. Revise language: change tenses- e.g. "what has happened" and "what will be" to "what is"
3. P. 8. Change language on BCA
4. P.12. - "Losses avoided data" will be gathered following local disaster events not (P.D.D), where possible.
5. P. 14 - change headings to FEMA terminology. Will fix.
Fix table 5. Will fix. Question $5 million not all used? Will explain as follows:
Jon explained: FEMA gave seed money to do a website to provide hazard mitigation information to jurisdiction. Jordan Hastings is setting it up. Will have a presentation on it at next meeting.

Rob Palmer brought up the Hazardous Materials handout and current mitigation measures - 19 pages – was provided too late to be included in the last plan; we will vote on it at the next meeting.

D. Jon opened the **PUBLIC COMMENT PERIOD.** There was no public comment provided.

E. **ANNOUNCEMENT OF TENTATIVE FUTURE MEETINGS**

Meetings are scheduled the last Monday of the first month in the calendar quarter at 1:30 pm.

a. April 25, 2011
b. July 25, 2011
c. October 31, 2011

The meeting was ADJOURNED.

Respectfully submitted,
D.D. LaPointe, Nevada Bureau of Mines & Geology

Agenda
Nevada Hazard Mitigation Planning Committee
PLANNING SUBCOMMITTEE
Monday, April 25, 2011, 1:30 pm
Division of Emergency Management
Executive Conference Room

2478 Fairview Drive
Carson City, NV 89701

DIAL-IN INFORMATION:
DIAL-IN #: 1-888-273-3658
PASS CODE: 8743295

C. WELCOME AND INTRODUCTIONS- *Chair, Jim Walker, NDOT*

D. (*)**APPROVAL OF MINUTES (action)**: January 24, 2011

E. **UPDATE OF THE STATE HAZARD MITIGATION PLAN,** *Chair, Jim Walker*

a. Review of Hazardous Materials Section Profile Changes – *Rob Palmer*, *NDEP*
b. MyPlan Website Project Presentation – *Jordan Hasting, NBMG*
c. Review and Input from Members about the Annual Review Questionnaire Information, *J. Walker*
d. Collection of the Completed Mitigation Activity/Project Report Form from Members, *J. Walker*
e. Report from the Plan Document Task Force – *Daphne LaPointe, UNR*

F. PUBLIC COMMENT PERIOD
a. Please note the public is welcome to attend the meeting. Members of the public may bring matters not appearing on the meeting agenda to the attention of the Committee. However, the Committee may discuss the matter when it is brought up, but no action may be taken until it has been included on a future agenda as an action item.

G. ANNOUNCEMENT OF TENTATIVE FUTURE MEETINGS
Meetings are scheduled the last Monday of the first month in the calendar quarter at 1:30 pm.
a. July 25, 2011
b. October 31, 2011
c. January 30, 2012

H. **ADJOURN**

The Committee may take action on items marked by an asterisk (*). Items may be taken out of order presented on the agenda at the discretion of the chairperson.

This is a public meeting. In conformance with the Nevada Public Meeting law, I Elizabeth Ashby, posted or caused the posting of this agenda on or before Tuesday, April 20, 2011, 9:00 a.m. at the following locations:

Nevada Division of Emergency Management (Carson City)
Nevada Bureau of Mines and Geology (Reno)
Clark County Department of Buildings Russell/Cameron Office, Las Vegas
And on the website for the Nevada Hazard Mitigation Planning Committee at http://www.nbmg.unr.edu/nhmpc/nhmpc.htm

For further information please contact Jonathan G. Price, State Geologist and Director, Nevada Bureau of Mines and Geology by email at jprice@unr.edu or telephone (775) 784-6691 extension 5.
We are pleased to make reasonable accommodations for members of the public who are disabled. If special arrangements are necessary, please notify the Committee at (775) 687-0314. Twenty-four hours advance notice is requested.

MINUTES
Nevada Hazard Mitigation Planning Committee
PLANNING SUBCOMMITTEE MEETING
Monday, April 25, 2011, 1:30 pm
Division of Emergency Management
Executive Conference Room

2478 Fairview Drive
Carson City, NV 89701

A. Welcome and introductions-Chair, Jim Walker, opened with a welcome and attendees introduced themselves. In attendance were:

Elizabeth Ashby NDEM
Rick Diebold LVOEM
Kim Groenewold Davis NDWR
Stacey Giomi CCFD
D.D. LaPointe NBMG
Robert Martinez NDWR
Robin Palmer NDCNR
Karen Walker, NDEM
Brooke Doty, Fusion Center, DPS, CC
Jordan Hastings, NBMG
Gary Johnson, NBMG

B. Jim presented the minutes from the January 25th meeting and called for the minutes to be approved; Rob Martinez moved to approve the minutes; Rick Diebold seconded the motion and the minutes were approved as presented.

Ca. Rob Palmer presented a revised version of the Hazardous Materials section of the NHMP, citing changes made mainly in Table 3.3.1, Incidents by County. There was some discussion of the revisions. Rick asked for inclusion of the reporting criteria which will be included with Jim's help from NDOT. Elizabeth and D.D. will update Table 3.3.3 accordingly based on this input when it is received and incorporate it into the final section of the revised NHMP. A short discussion followed about the inclusion in this section of fixed facilities with hazardous materials. Rob stated the information is found by county in Table 3-32. Jim asked if there were any further comments on the Hazardous Materials section and there were none.

Cb. Jim called on Jordan Hastings and Gary Johnson from NBMG who gave a joint presentation on the FEMA-grant-sponsored *MyPlan Website Project* they have developed over the past 6-8 months. It is a joint project between California and Nevada for assembling and assessing GIS data for use in hazard management planning.

MyPlan allows city, county, state, and other stakeholders user access to GIS data and helps them with multihazard planning in the following ways:

- Identify stakeholders
- Correlate and harmonize data across the state boundary
- Do periodic reviews and updates
- Introduce jurisdictions to web tools
- Collect local data

ESRI can be used for disaster response as well as pre-disaster mitigation. There was discussion among committee members of its use. Stacey had questions on wildland fire components and matching maps and graphics across state lines. Kim had questions about the source of the flood data used, which Gary said came from FEMA.

Gary and Jordan both stressed that they need input from Subcommittee members for MyPlan on how to facilitate the exchange of information and how to organize it, by county or by hazard. Elizabeth and others voted for by hazard, and suggested starting with flood and wildfire since we already have those contacts here to arrange future meetings to exchange data. They also discussed getting GIS folks from the different agencies together with Gary and Jordan together to exchange data, possibly at a big upcoming GIS meeting at the Atlantis in early May.
Jim thanked Jordan and Gary for their report.

Cc. Jim asked Subcomittee members to review the Annual Review Questionnaire and provide input and feedback on it to Elizabeth as a way to keep the plan updated and to make sure everything is covered. We need to consider the audience and see if we are lacking any needed state agency representatives.

We need a detailed explanatory letter of who we are and what we do to send prospective members. The following possible new members were mentioned:

Internal NHMPC members
State Public Works Dept.
Buildings & Grounds.
Tribes. Elizabeth reiterated that the tribes have been contacted repeatedly and invited to attend but have not participated regularly.
Health and Human Services were mentioned as an Agency we could approach.
Rhett Milne, or State Climatologist mentioned (we received his input and report in January – not sure if we need regular meeting attendance).
State Fire Marshall's Office
Fusion Center (Brooke Doty) – here today

Elizabeth said she will formalize a letter and invitations to those people/agencies mentioned

Better public & business awareness of the Hazard Mitigation Planning process was discussed. Jim and Elizabeth mentioned discussions we have had on outreach to businesses and looking at possible business contacts/private sector. One difficulty is that no one single organization seems to encompass the entire state. Stacey Giomi suggested having a Governor's Proclamation and Hazard Awareness Week. We could draft a letter to emergency managers at the county and local level making them aware of the planning process and asking them for input and participation.

Cd. Discussion of other completed mitigation projects – anything that needs to be included in our tabulation and report – please keep ongoing records for NHMP revision.

Ce. D.D. reported on NHMP Planning Task force meeting of Elizabeth, Jim, and D.D. on April 7, 2011. We discussed outreach to the public and businesses with mitigation information. We could consider going through the Small Business Administration, which would be effective if loans are involved. Jim suggested requiring mitigation as part of the —continuity of business planning" required by some banks before loans are made. We should make wildfire and earthquake mitigation brochures available to the lending and insurance agencies to give businesses applying for loans. We could also look at business licensing process through the community and at the state business taxation process to see where mitigation might fit.
We also began looking at what revisions will be needed to the 2010 plan for the 2013 updated plan. We reviewed all sections for major changes, which will be the addition of the hazardous materials section, incorporation of the enhanced plan changes, and incorporation of any needed changes based on Rhett Milne's climate change report and how it might affect any sections of the NHMP.

D. Jim opened the Public Comment period of the meeting; there was no public comment.

E. Future planned Subcommittee meeting dates were discussed and scheduled for the last Monday of the first month in the calendar quarter at 1:30 pm on these dates:

a. July 25, 2011
b. October 31, 2011
c. January 30, 2012

F. The meeting was adjourned.

Respectfully submitted,
Daphne D. LaPointe, Nevada Bureau of Mines & Geology

Agenda
Nevada Hazard Mitigation Planning Committee
PLANNING SUBCOMMITTEE
Monday, July 25, 2011, 1:30 pm
Division of Emergency Management
Executive Conference Room

2478 Fairview Drive
Carson City, NV 89701

DIAL-IN INFORMATION:
DIAL-IN #: 1-888-273-3658
PASS CODE: 8743295

I. WELCOME AND INTRODUCTIONS- *Mike Dondero, NDF, sitting in for Chair, Jim Walker*

J. (*)**APPROVAL OF MINUTES (action)**: April 25, 2011

K. **UPDATE OF THE STATE HAZARD MITIGATION PLAN**

a. Welcome and Introduction of New Members – Mike Dondero
b. Review and Input from Members about the Annual Review Questionnaire Information, *M. Dondero*
c. Collection of the Completed Mitigation Activity/Project Report Form from Members, *M. Dondero*
d. Report from the Plan Document Task Force & Invitation Letters – *Daphne LaPointe, UNR& Karen Johnson, DEM*
e. Hazard Profile List & MyPlan Update – *Elizabeth Ashby, DEM*

L. PUBLIC COMMENT PERIOD

a. Please note the public is welcome to attend the meeting. Members of the public may bring matters not appearing on the meeting agenda to the attention of the Committee. However, the Committee may discuss the matter when it is brought up, but no action may be taken until it has been included on a future agenda as an action item.

M. ANNOUNCEMENT OF TENTATIVE FUTURE MEETINGS

Meetings are scheduled the last Monday of the first month in the calendar quarter at 1:30 pm.
a. October 31, 2011
b. January 30, 2012

N. **ADJOURN**

The Committee may take action on items marked by an asterisk (*). Items may be taken out of order presented on the agenda at the discretion of the chairperson.

This is a public meeting. In conformance with the Nevada Public Meeting law, I Elizabeth Ashby, posted or caused the posting of this agenda on or before Wednesday, July 20, 2011, 9:00 a.m. at the following locations:

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Nevada Bureau of Mines and Geology (Reno)
Clark County Department of Buildings Russell/Cameron Office, Las Vegas
And on the website for the Nevada Hazard Mitigation Planning Committee at http://www.nbmg.unr.edu/nhmpc/nhmpc.htm

For further information please contact Jonathan G. Price, State Geologist and Director, Nevada Bureau of Mines and Geology by email at jprice@unr.edu or telephone (775) 784-6691 extension 5.
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Minutes

Nevada Hazard Mitigation Planning Committee

PLANNING SUBCOMMITTEE

Monday, July 25, 2011, 1:30 pm

Division of Emergency Management, Executive Conference Room

2478 Fairview Drive

Carson City, NV 89701

Attendees:

Mike Dondero, Temporary Chair, Nevada Division of Forestry
Elizabeth Ashby, Nevada Division of Emergency Management
Will Bergquist, Washoe Tribal Representative
Bill Elliott, Nevada Division of Emergency Management
Dr. Keith Forbes, D.V.M. Nevada Dept. of Agriculture (*via teleconference)*
Rajat Jain, Nevada Division of Insurance
Angela Krutsinger, Nevada Hospital Association (*via teleconference)*
D. D. LaPointe, Nevada Bureau of Mines and Geology
Maureen Martinez, Nevada Risk Management Division
Rhett Milne, National Weather Service, Reno
Robin Palmer, Nevada Dept. of Conservation and Natural Resources
Branden Pearson, State Public Works Board

WELCOME AND INTRODUCTIONS

Temporary Chair Mike Dondero, opened the meeting at 1:30 P.M and welcomed attendees who introduced themselves. Copies of the April meeting minutes and meeting materials to be discussed were distributed to attendees.

APPROVAL OF MINUTES

Mike asked if there were any changes needed to the April minutes. As there were none noted, Maureen made a motion to approve the minutes, Raj seconded the motion and the April subcommittee meeting minutes were approved as submitted.

NEW MEMBERS TO THE PLANNING SUBCOMMITTEE

Elizabeth reemphasized that the planning process should include as broad a stakeholder base as possible in order to produce a comprehensive mitigation plan and to that end, with input from existing members and other plans, additional subcommittee members were sought, some of whom are with us today:

Branden Pearson represents the State Public Works Board. Angela Krutsinger, attending via teleconference is representing the Nevada Hospital Association. Rhett Milne, who gave us input on mitigation aspects of climate change at our last meeting, is representing the National Weather Service. Will Bergquist from the Washoe Tribe is representing the Intertribal

Emergency Response Council. Rajat Jain is representing the Nevada Division of Insurance Emergency Support Function 14 (Recovery & Mitigation).

Elizabeth provided all new members with information packets containing the following mitigation plan materials:

1. CD of the current Nevada Hazard Mitigation Plan
2. List of currently recognized hazards
3. Spreadsheet of the mitigation process
4. Outline of the funding of the Plan. There was brief discussion of the importance of having an updated plan in order to obtain funding from FEMA for hazard mitigation and public assistance for reconstruction funding.
5. Status of county & tribal hazard mitigation plans

Maureen requested that Elizabeth provide existing members with copies of the same packet materials as well, as they may have become scattered or outdated.

Elizabeth asked all subcommittee members if they know of any legislative changes that might affect or have any impact on hazards, risk, or mitigation, and to please convey that information back to the subcommittee.

Maureen mentioned that there is a change in the insurance certificate notification process; the insurance company will not notify a third party if an insurance policy is cancelled – only the insured will be notified. Will this have an impact or be of interest to FEMA? Elizabeth says it may affect our emergency declaration process. Maureen will look into it and report back.

Bill Elliott mentioned that there might be some repercussions from the recent train/truck collision and derailment. Once the NTSB report on it is in, we should review it and determine if it contains anything that should be addressed in the mitigation plan. Angela mentioned that Amtrak will be doing an After-Action Review on the same train-truck accident dealing with the handling of the burn victims and the existence of only one burn center in the state (in Las Vegas). Angela and Bill will report back after the After-Action Review.

Angela asked about Mutual Aid Agreements and Memoranda of Understanding that must be in place first in order for FEMA to reimburse hospitals for treatment rendered following certain disasters. Also MAAs and MOUs should address putting victims up in local hotels while being treated but rate needs to be decided in advance in order for federal reimbursement to occur. These are issues that should be addressed in the individual emergency response plans of the entities such as the hospitals, cities, tribes or counties. Angela's input should be referred to Bill Elliott at NDEM for further consideration by these entities in their response plans.

Raj brought up a concern faced currently by Arizona of floods caused by fires burning off all the vegetation in an area and asked – Where can we get information on that and the probability of it happening here following wildland fires? Mike Dondero answered that they are on top of it (NDF) and have Community Wildfire Protection Plans (CWPPs) completed for all counties and communities susceptible and have identified risks and hazards by vegetation type etc. The Western States are in the process of producing a Wildfire Risk Assessment which is expected to be published in October. This information will be openly available to the public and all agencies. County-wide plans are online and available in NDF offices. Elizabeth added that communities

and counties update their fire/flood/earthquake plans at least every 5 years and these are integrated into the State Plan every three years.

Bill asked if emergency response plans have been made for watersheds affected by new dam construction, specifically dams related to mining operations such as tailings dams? This is a question for NDEP/HazMat and should be referred to Rob Martinez and Rob Palmer for further clarification.

The Completed Mitigation Activity/Project Report Form was discussed - this is an annual review of completed mitigation projects and is what we are "graded" on by FEMA every year. Elizabeth asked Subcommittee members to review it and complete it for any projects they know of as they are completed.

D.D. reported on Planning Team meetings and progress: we reviewed FEMA's Crosswalk comments and our plans to address recommended revisions; invited new stakeholder representatives to join the Subcommittee; revised Section Zero statistics ad added climate change comments; and added a Hazardous Materials Section. Elizabeth also expanded on some of these activities.

Mike opened the meeting for public comment; there was none.

The next meeting is scheduled for Monday, October 31, 2011.

Bill Elliott moved to adjourn the meeting, Rhett Milne seconded the motion and meeting was adjourned.

Respectfully submitted, 18 August 2011

by Daphne D. LaPointe

Nevada Bureau of Mines & Geology

Agenda
Nevada Hazard Mitigation Planning Committee
PLANNING SUBCOMMITTEE
Monday, October 31, 2011, 1:30 pm
Division of Emergency Management
Executive Conference Room

2478 Fairview Drive
Carson City, NV 89701

DIAL-IN INFORMATION:
DIAL-IN #: 1-888-273-3658
PASS CODE: 8743295

The committee may take action on items marked "For Possible Action." Items may be taken out of the order presented on the agenda at the discretion of the chairperson. Items may be combined for consideration by the Committee at the discretion of the chairperson. Items may be pulled or removed from the agenda at any time.

A. WELCOME AND INTRODUCTIONS- *Chair, Jim Walker, NDOT*

B. **PUBLIC COMMENTS -** Comments will not be restricted based on viewpoint.

C. (*)**APPROVAL OF MINUTES (for possible action)**: July 25, 2011

D. **UPDATE OF THE STATE HAZARD MITIGATION PLAN**

a. Welcome and Introduction of New Members – *Chair, Jim Walker*
b. Review of the Crosswalk documents and structure of the current state hazard mitigation plan from *Table of Contents, Elizabeth Ashby, NDEM*
c. Review and Input from Members about the Annual Review Questionnaire Information, *Chair, Jim Walker*
d. Collection of the Completed Mitigation Activity/Project Report Form from Members, *Chair, Jim Walker*
e. Report from the Plan Document Task Force –- *New Hazard Prioritization Criteria and worksheet DD LaPointe NBMG, & Elizabeth Ashby*
f. Completion & submission of Hazard Prioritization Forms by Subcommittee members, *Chair, Jim Walker*
g. Possible discussion and approval of the ranking of the identified hazards (action), *Chair, Jim Walker*

E. **PUBLIC COMMENTS -** Comments will not be restricted based on viewpoint.

a. Please note the public is welcome to attend the meeting. Members of the public may bring matters not appearing on the meeting agenda to the attention of the Committee. However, the Committee may discuss the matter when it is brought up, but no action may be taken until it has been included on a future agenda as an action item.

F. ANNOUNCEMENT OF TENTATIVE FUTURE MEETINGS
Meetings are scheduled the last Monday of the first month in the calendar quarter at 1:30 pm.
a. *January 30, 2012*
b. *April 30, 2012*
c. *July 30, 2012*
d. *October 29, 2012*

G. **ADJOURN -** (For Possible Action)

The Committee may take action on items marked by an asterisk (*). Items may be taken out of order presented on the agenda at the discretion of the chairperson.

This is a public meeting. In conformance with the Nevada Public Meeting law, I Elizabeth Ashby, posted or caused the posting of this agenda on or before Wednesday, October 26, 2011, 9:00 a.m. at the following locations:

Nevada Division of Emergency Management (Carson City); Nevada Bureau of Mines and Geology (Reno);
Clark County Government Center (Las Vegas); Clark County Department of Development Services (Las Vegas)
Clark County Flood Control District (Las Vegas);
And on the website for the Nevada Hazard Mitigation Planning Committee at http://www.nbmg.unr.edu/nhmpc/nhmpc.htm

For further information please contact Jonathan G. Price, State Geologist and Director, Nevada Bureau of Mines and Geology by email at jprice@unr.edu or telephone (775) 784-6691 extension 5.
We are pleased to make reasonable accommodations for members of the public who are disabled. If special arrangements are necessary, please notify the Committee at (775) 687-0314. Twenty-four hours advance notice is requested.

Minutes

Nevada Hazard Mitigation Planning Committee

PLANNING SUBCOMMITTEE

Monday, October 31, 2011, 1:30 pm

Division of Emergency Management, Executive Conference Room

2478 Fairview Drive

Carson City, NV 89701

Attendees:

James L. Walker, Nevada Department of Transportation, Chairman
Elizabeth Ashby, Nevada Division of Emergency Management
Robert Martinez, Nevada Division of Water Resources
Jeffrey Erwin, Nevada Division of Environmental Protection
Rhett Milne, National Weather Service, Reno
Mike Rife, State Public Works Board
Bob Patton, Nevada Division of Forestry
Jonathan G. Price, Nevada Bureau of Mines and Geology
Daphne D. LaPointe, Nevada Bureau of Mines and Geology
Dr. Keith Forbes, D.V.M. Nevada Dept. of Agriculture (*via teleconference)*

A. WELCOME AND INTRODUCTIONS

Chairman Jim Walker opened the meeting at 1:40 P.M and welcomed attendees who introduced themselves around the table and asked for teleconferencing attendee, Keith Forbes to introduce himself. The sign-in sheet was passed around, copies of the April meeting minutes and other current meeting materials to be discussed were distributed to attendees.

B. Public Comments – none.

C. APPROVAL OF MINUTES

Jim asked if there were any comments on the April minutes or changes needed. As there were none noted, he called for a motion to approve the minutes, which was made by Rob Martinez, seconded by Mike Rife, and the April subcommittee meeting minutes were approved by the membership by voice vote as submitted.

D. UPDATE OF THE STATE HAZARD MITIGATION PLAN

a. New members to the planning subcommittee were welcomed and thanked.
b. Elizabeth explained where we currently are in the plan update process and reiterated the importance of updating and maintaining the enhanced plan in obtaining funding for mitigation projects, and how we use the Crosswalks to accomplish this. The plan Table of Contents was given to all attendees showing the next tasks that need to be accomplished – prioritization of hazards followed by risk assessment.

c. Annual Review Questionnaire. Elizabeth asked all subcommittee members to look at this again and if they know of any legislative or departmental news or changes that might affect or have any impact on hazards, risk, or mitigation, and to please convey that information back to the subcommittee.

Jon Price described a Power Point he will be presenting to the NESC meeting this week and that will be made available to all. He also reported that UNR Seismology Director Graham Kent has been reporting on his recent research with UC San Diego on past tsunami/seiche activity at Lake Tahoe including evidence for a huge event about 50,000 years ago as well as several other smaller but sizeable events recurring about every few thousand years. Rhett asked if joint partnerships with California earthquake study groups such events as earthquake/tsunami/seiche fall under our —umbrella" of hazards to address for the state. Jon replied yes, and Graham's report was addressing the communication issue on tsunami/seiche warnings –(what would we do in such events?) It would involve Washoe, Carson City, and Douglas counties.
Another project underway mentioned was a wildfire assessment for Douglas County.
Rhett reported that the Truckee River Flood Project group is working on a High Resolution Inundation Map for the Truckee River floodplain.
Elizabeth said that she needs to integrate reports and updates on all these projects into the —MyPlan" website and would appreciate brief e-mailed or written synopses of these from committee members to help her in this.

d. Elizabeth asked Subcommittee members to review and submit the Completed Mitigation Activity/Project Report Form for any projects that they know to have been completed. These forms will constitute an annual review of completed mitigation projects will be what we are —graded" on by FEMA every year. So far only Stacey Giomi has submitted any of these forms. Jon asked if members should submit forms for non-state, privately funded mitigation activity we know to have been completed, too. Elizabeth said yes, we should.

e. D.D. reported that the Planning Team has been working on developing a new Hazard Prioritization Criteria and Hazard Prioritization Worksheet that would be easier to tabulate numerically than the last one. We based it loosely on Arizona's, adjusted to fit our hazards and revised it according to input received from Subcommittee members.

f. The final Hazard Prioritization Criteria form and Hazard Prioritization Worksheet were presented to the attendees with the goal of having them completed and submitted and tabulated by the end of today's meeting. Each hazard was briefly discussed and input was requested from any members present and on teleconference with expertise or information bearing on the hazards.

Rob Martinez stated that he is working with the state Climatologist on a State Drought Plan and should have resulting material to add to the plan before the update date.

Several members suggested and all agreed that we add dust storm under the severe windstorm category and discuss in the description section the reduced visibility due to dust that can occur during some severe windstorms, which is not currently addressed in the hazards. This has been a recurring hazard recently in Arizona (the —haboobs").
In light of a recent truck/train collision, traffic accidents were discussed as potential hazards but were not added as a separate or new hazard.

All Subcommittee members were asked to complete the Hazard Prioritization Worksheet and submit it. Jon Price and Elizabeth Ashby collected and tabulated the subcommittee members' worksheet data. The four hazards ranked highest by subcommittee members were earthquakes, wildfire, terrorism, and flood, in that order.

g. There was brief discussion of these results. Jon Price made a motion to approve the results of the hazard prioritization and rankings, the motion was seconded by Mike Rife, all were in favor and the motion passed. The Hazard Prioritization Worksheets and rankings will be included in the plan update.

E. Jim requested any public comment but there was none.

F. The dates of the next meetings are scheduled as follows:

Monday, January 30, 2012, 1:30 PM
Monday, April 30, 2012, 1:30 PM
Monday, July 30, 2012, 1:30 PM
Monday, October 29, 2012, 1:30 PM

G. The meeting was adjourned.

Respectfully submitted, 10 November 2011

by Daphne D. LaPointe

Nevada Bureau of Mines & Geology

Agenda
Nevada Hazard Mitigation Planning Committee
PLANNING SUBCOMMITTEE
Monday, January 30, 2012, 1:00 pm
Division of Emergency Management
Executive Conference Room

2478 Fairview Drive
Carson City, NV 89701

DIAL-IN INFORMATION:
DIAL-IN #: 1-888-273-3658
PASS CODE: 8743295

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A. WELCOME AND INTRODUCTIONS- *Acting Chair, Jon Price*

B. **PUBLIC COMMENTS -** Comments will not be restricted based on viewpoint.

C. (*)**APPROVAL OF MINUTES (for possible action)**: October 30, 2011

D. **UPDATE OF THE STATE HAZARD MITIGATION PLAN**

a. Welcome and Introduction of New Members – *Acting Chair, Jon Price*
b. Review and Input from Members about the Annual Review Questionnaire Information, *Acting Chair, Jon Price*
c. Collection of the Completed Mitigation Activity/Project Report Forms from Members and Link to the State Hazard Mitigation Plan Goals And Actions, *Acting Chair, Jon Price*
d. Report from the Plan Document Task Force –- *New simplified and standardized table to show ranking of hazards by counties and tribal entities. DD LaPointe NBMG*
e. Completion & submission of Hazard Prioritization Forms by Subcommittee members not present at last meeting, *Acting Chair, Jon Price*
f. Discussion and approval of the revised ranking of the identified hazards after inclusion of new data from members not present at last meeting (action), *Acting Chair, Jon Price*
g.

E. **PUBLIC COMMENTS -** Comments will not be restricted based on viewpoint.

a. Please note the public is welcome to attend the meeting. Members of the public may bring matters not appearing on the meeting agenda to the attention of the Committee. However, the Committee may discuss the matter when it is brought up, but no action may be taken until it has been included on a future agenda as an action item.

F. ANNOUNCEMENT OF TENTATIVE FUTURE MEETINGS
Meetings are scheduled the last Monday of the first month in the calendar quarter at 1:30 pm.
a. *April 30, 2012*
b. *July 30, 2012*
c. *October 29, 2012*

G. **ADJOURN -** (For Possible Action)

The Committee may take action on items marked by an asterisk (*). Items may be taken out of order presented on the agenda at the discretion of the chairperson.

This is a public meeting. In conformance with the Nevada Public Meeting law, I Elizabeth Ashby, posted or caused the posting of this agenda on or before Wednesday, October 26, 2011, 9:00 a.m. at the following locations:

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Clark County Government Center (Las Vegas); Clark County Department of Development Services (Las Vegas)
Clark County Flood Control District (Las Vegas);
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Agenda
Nevada Hazard Mitigation Planning Committee
PLANNING SUBCOMMITTEE
Monday, February 13, 2012, 1:30 pm
Division of Emergency Management
Executive Conference Room

2478 Fairview Drive, Carson City, NV 89701
DIAL-IN INFORMATION:
DIAL-IN #: 1-888-273-3658
PASS CODE: 8743295

The committee may take action on items marked "Discussion/For Possible Action." Items may be taken out of the order presented on the agenda at the discretion of the chairperson. Items may be combined for consideration by the Committee at the discretion of the chairperson. Items may be pulled or removed from the agenda at any time.

A. **WELCOME AND INTRODUCTIONS-** *Acting Chair, Jon Price*

B. **PUBLIC COMMENT** (Discussion only) – No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments are limited to 3 minutes unless the Committee elects to extend the comments for purposes of further discussion. Comments will not be restricted based on viewpoint.

C. **APPROVAL OF MINUTES** (Discussion/For Possible Action): October 30, 2011

D. **UPDATE OF THE STATE HAZARD MITIGATION PLAN**

a. Welcome and Introduction of New Members – *Acting Chair, Jon Price*
b. Review and Input from Members about the Annual Review Questionnaire Information, *Acting Chair, Jon Price*
c. Collection of the Completed Mitigation Activity/Project Report Forms from Members and Link to the State Hazard Mitigation Plan Goals And Actions, *Acting Chair, Jon Price*
d. Completion & submission of Hazard Prioritization Forms by Subcommittee members not present at last meeting, *Acting Chair, Jon Price*
e. Discussion and approval of the revised ranking of the identified hazards after inclusion of new data from members not present at last meeting (Discussion/For Possible Action): *Acting Chair, Jon Price*
f. Report from the Plan Document Task Force –- *New simplified and standardized table to show ranking of hazards by counties and tribal entities. DD LaPointe Nevada Bureau of Mines and Geology*
g. *Discussion of hazards identified by counties and tribes in their hazard mitigation plans, not currently listed in Table 3-1 "Identification and Screening of Hazards Affecting Nevada" of the State Hazard Mitigation Plan.*
   i. *Motion to include any additional hazards in Table 3-1 of the state plan.* (Discussion/For Possible Action):
   ii. *Motion to group the 5 current state plan hazard categories into high, significant and low for ease of comparison with local plan rankings.* (Discussion/For Possible Action):

E. **ANNOUNCEMENT OF TENTATIVE FUTURE MEETINGS**

Regular meetings are scheduled the last Monday of the first month in the calendar quarter at 1:30 pm.
a. *April 30, 2012*
b. *July 30, 2012*
c. *October 29, 2012*

F. **PUBLIC COMMENT** (Discussion only) – No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments are limited to 3 minutes unless the Committee elects to extend the comments for purposes of further discussion. Comments will not be restricted based on viewpoint.

G. **ADJOURN -** (For Possible Action)

This is a public meeting. In conformance with the Nevada Public Meeting law, I Elizabeth Ashby, posted or caused the posting of this agenda on or before Wednesday, February 7, 2012, 9:00 a.m. at the following locations:

Nevada Division of Emergency Management (Carson City); Nevada Bureau of Mines and Geology (Reno);
Clark County Government Center (Las Vegas); Clark County Department of Development Services (Las Vegas)

And on the website for the Nevada Hazard Mitigation Planning Committee at http://www.nbmg.unr.edu/nhmpc/nhmpc.htm

For further information please contact Jonathan G. Price, State Geologist and Director, Nevada Bureau of Mines and Geology by email at jprice@unr.edu or telephone (775) 784-6691 extension 5.
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Minutes

Nevada Hazard Mitigation Planning Committee

Special Meeting

Monday, February 13, 2012, 1:30 pm

Division of Emergency Management, Emergency Operations Center Room

2478 Fairview Drive

Carson City, NV 89701

Attendees:

Jim Walker, Chair Nevada Department of Transportation
Jonathan Price, Nevada Bureau of Mines and Geology
Rick Diebold, Clark County
Elizabeth Ashby, Nevada Division of Emergency Management
Bill Elliott, Nevada Division of Emergency Management
Robin Palmer, Nevada Dept. of Conservation and Natural Resources
Rob Martinez, Nevada Division of Water Resources
Stacey Giomi, Carson City
D. D. LaPointe, Nevada Bureau of Mines and Geology
David Gould, Nevada Risk Management
Dr. Keith Forbes, D.V.M. Nevada Dept. of Agriculture (*via teleconference)*

WELCOME AND INTRODUCTIONS

A. Chair Jim Walker, called the meeting to order at 1:30 P.M. thanked everyone who had come and welcomed attendees who introduced themselves. Copies of the October meeting minutes and meeting materials to be discussed were distributed to attendees.
B. There was a call for public comment; D.D. reminded Elizabeth that we had an e-mailed public comment that referred to the 2004 version of the State hazard mitigation plan. The commenter stated that the plan referred to Nevada as a ~~h~~ome rule" state. That has been corrected in the more recent update of the plan Elizabeth says she thanked him for his comments and input, and referred him to the more recent plan update available online. Jim asked for any additional public comment and there was none.
C. APPROVAL OF MINUTES
Jim asked if there were any changes needed to the October minutes. As there were none noted, Rick made a motion to approve the minutes, Bill seconded the motion and the October subcommittee meeting minutes were approved as submitted.

Da. Jim welcomed new members.
Db. Elizabeth requested that Subcommittee members continue to turn in Annual Review Questionnaire forms for 2011 if they have not already done so.
Dc. Elizabeth requested that Subcommittee members turn in Completed Mitigation Project Activity Project reports as the projects are completed.

She asked if there were any new maps available that might help in the updating of any of the hazards in Section 3 of the plan:

Rob mentioned that there is a new Superfund map for mercury available online that we can refer to under Hazardous Materials

Under Drought, Bill Elliott said the State Drought Plan is being revised from the existing 2003 plan and should be done within the next 2-3 months
Under Earthquakes, Jon Price said that the URM study (statewide database of unreinforced masonry buildings) is underway and should be completed soon – will include about 24,000 data points.
Bill Elliott said the redo of the vulnerability analysis of the State's "DoIT" EITS, telecommunications facility will be done within the next year. *Any edits needed?*

Dd. Collection of additional Hazard Prioritization Forms not yet included in the tallying done after the last meeting.

Jon Price mentioned that we might want to include erionite in the next update of the plan as a hazard – a volcanic material that causes mesothelioma. He gave a brief outline of the mineral, which does occur at about 20 localities in the state and although it is not used now as road gravel, it should be a concern and companies should be warned to stay away from using these sites as sources of road gravels.
There was discussion of the revised rankings of identified hazards based on the member input since the last meeting. We decided to table further discussion on ranking of hazards until after discussion of hazards identified by the local and tribal plans.

Df. D.D. LaPointe presented a composite table that the Planning Team developed to show hazards identified in the plans submitted and approved by the counties and tribal entities. In the next update, it will take the place of multiple tables in Section 3 of the last updated plan, thus streamlining and cutting out extra pages. It also provides a simple mode of comparison between counties and the state for which hazards are being identified and profiled and where efforts need to be focused. It also shows at a glance which counties and tribes need to get plans completed. Subcommittee members made useful suggestions such as adding wording that —this data came from approved county and tribal plans" and instead of –significant" for the middle ranking we use —moderate/significant" with definitions of the rankings indicated.

Dg. i. Several hazards were identified by the local plans that were not directly or separately addressed in the state plan; each of these was briefly discussed by the Subcommittee and a decision was made as to whether it was already included under another hazard, and whether it should be profiled or not in the State Plan. There was some disagreement as to whether utility loss should be considered a separate hazard and it was agreed to have a spokesman from NV Energy come in to give us a presentation at a future meeting. No action was required.

Dg. Ii. There was discussion and agreement to change the grouping of hazards from 5 groupings (Very High, High, Moderate, Low, Very Low) to a simplified three groupings (High, Significant/Moderate, Low) in order to more closely correspond to the rankings assigned to hazards by most of the county and tribal hazard mitigation plans.

Jim opened the meeting for public comment; there was none.

The next meeting is scheduled for Monday, April 30, 2012.

Bill Elliott moved to adjourn the meeting, Rhett Milne seconded the motion and meeting was adjourned.

Respectfully submitted, 13 February 2012

by Daphne D. LaPointe

Nevada Bureau of Mines & Geology

Agenda

Nevada Hazard Mitigation Planning Committee

PLANNING SUBCOMMITTEE

Monday, April 30, 2012, 1:00 pm

Division of Emergency Management

Executive Conference Room

2478 Fairview Drive, Carson City, NV 89701

DIAL-IN INFORMATION:

DIAL-IN #: 1-888-273-3658

PASS CODE: 8743295

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A. WELCOME AND INTRODUCTIONS- *Chair, Jim Walker*

B. PUBLIC COMMENTS – (Discussion only). No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments are limited to 3 minutes unless the Committee elects to extend the comments for purposes of further discussion. Comments will not be restricted based on viewpoint.

C. (*)**APPROVAL OF MINUTES (for possible action)**: February 13, 2012

D. UPDATE OF THE STATE HAZARD MITIGATION PLAN (Discussion only).

a. Welcome and Introduction of New Members – *Chair, Jim Walker, Nevada Department of Transportation (NDOT)*
b. Review and Input from Members about the Annual Review Questionnaire Information, *Chair, Jim Walker*
c. Collection of the Completed Mitigation Activity/Project Report Forms from Members and Link to the State Hazard Mitigation Plan Goals And Actions, *Chair, Jim Walker*
d. Review of all edits to Section 3 Hazard Identification and Risk Analysis. *D. LaPointe, Nevada Bureau of Mines and Geology*
e. Evaluate mitigation goals and strategic actions, Table 4-2, for continued validity in the 2013 plan iteration. *Chair, Jim Walker*

E. ANNOUNCEMENT OF TENTATIVE FUTURE MEETINGS (Discussion only).

Meetings are scheduled the last Monday of the first month in the calendar quarter at 1:30 pm.
a. July 30, 2012
b. October 29, 2012

F. PUBLIC COMMENTS - (Discussion only).

No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments are limited to 3 minutes unless the Committee elects to extend the comments for purposes of further discussion. Comments will not be restricted based on viewpoint.

G. ADJOURN - (For Possible Action)

This is a public meeting. In conformance with the Nevada Public Meeting law, I Elizabeth Ashby, posted or caused the posting of this agenda on or before Wednesday, April 25, 2012, 9:00 a.m. at the following locations:
Nevada Division of Emergency Management (Carson City); Nevada Bureau of Mines and Geology (Reno);
Clark County Government Center (Las Vegas); Clark County Department of Development Services (Las Vegas)
Clark County Flood Control District (Las Vegas);
And on the website for the Nevada Hazard Mitigation Planning Committee at http://www.nbmg.unr.edu/nhmpc/nhmpc.htm

For further information please contact Jonathan G. Price, State Geologist and Director, Nevada Bureau of Mines and Geology by email at jprice@unr.edu or telephone (775) 784-6691 extension 5.
We are pleased to make reasonable accommodations for members of the public who

Minutes

Nevada Hazard Mitigation Planning Committee

Meeting

Monday, April 30, 2012, 1:00 pm

Division of Emergency Management, Emergency Operations Center Room

2478 Fairview Drive

Carson City, NV 89701

Attendees:
Subcommittee Members:
Jim Walker, Chair Nevada Department of Transportation
Elizabeth Ashby, Nevada Division of Emergency Management
Jonathan Price, Nevada Bureau of Mines and Geology
Rob Martinez, Nevada Division of Water Resources
Stacey Giomi, Carson City Fire Dept.
Marie Barry, Washoe Tribe of NV & CA
Karen Johnson
Michael Rife State Public Works Board

D. D. LaPointe, Nevada Bureau of Mines and Geology

Rick Diebold, Clark County (*via teleconference)*
Angel Krutsinger, NV State Hospital Association (*via teleconference)*
Rhett Milne, National Weather Service, Reno (*via teleconference)*
Rajat Jain, NV Division of Insurance (*via teleconference)*
Marie Holt, NV Division of Insurance (*via teleconference)*

Guest:
Stephanie Hicks, R. O. Anderson Engineering

WELCOME AND INTRODUCTIONS

A. Chair Jim Walker, called the meeting to order at 1:00 P.M. thanked everyone who had come and welcomed attendees who introduced themselves as listed above. Copies of the February Special Meeting minutes and meeting materials to be discussed were distributed to attendees.
B. Jim asked for any public comment and read the action statement; there was no public comment.
C. APPROVAL OF MINUTES
Jim asked if all had a chance to look at the February Special Meeting minutes and if there were any discussion or changes needed. As there were none noted, Rick made a motion to approve the minutes, Stacey seconded the motion, all

approved and the February Subcommittee Special Meeting minutes were approved as submitted.

Da. Jim welcomed new member Marie Barry from the Washoe Tribe of Nevada and California and all agreed that we look forward to her participation and resultant increased interaction with the tribe and Inter-Tribal Emergency Response Commission (ITERC).

Jim also thanked Jon Price for his past service on the Subcommittee with his upcoming retirement at the end of June and asked if he would consider continuing to serve on the Subcommittee after retirement, which Jon agreed to do as his schedule permits.

Db. Subcommittee members were requested to provide input on answers to questions on the Annual Review Questionnaire form. Jim and Elizabeth guided the Subcommittee in a review of each question for the first two sections of the form. Much new material was provided by Subcommittee members especially in the areas of public outreach and additional maps and hazard studies. This material will be incorporated into the next iteration of the Plan. Jim Walker brought up for discussion the one hazard identified by locals that the Subcommittee agreed earlier on that needs further research as to whether it should be profiled—Utility Loss. He said he would ask Jim Reagan, a representative of NV Energy, to come and address the Subcommittee on this issue in the next meeting to continue our information-gathering and help us with determining if it should be included in this or a future iteration of the Plan.

Rob asked if cyberterrorism should also be considered. Jim Walker said he would contact the Fusion Center to request a representative to address the subcommittee on this issue. Chris Ipsen from IT will address the full NHMP Committee and will give them more information on whether it should be profiled as a new hazard or be included under the existing hazard heading of Terrorism/WMD.

Dc. Subcommittee members were requested to turn in Completed Mitigation Project Activity Project reports as projects they are aware of are completed.

Dd. D.D. LaPointe handed out and reviewed edits to Section 3 of the Plan since the last meeting that bring it up to date with the changes in the Subcommittee's process of hazard identification, ranking, and prioritization. She also requested that Subcommittee members review hazard profile sections based on their areas of expertise. Sections were parceled out to Subcommittee members according to their areas of expertise.

The subcommittee reviewed the Hazard rankings on the final Hazard Prioritization Table and discussed categorization of the hazards into rankings of —High,"
—Medium/Significant," and —Low."

After some discussion, the Subcommittee agreed on the groupings of:

—High" for Earthquake, Wildfire, and Flood

—Medium/Significant" for Terrorism/WMD, Hazardous Materials, Drought, and Severe Winter Storm, and

"Low" for the rest: Tsunami/Seiche, Hail & Thunderstorm, Epidemic, Avalanche, Windstorm, Landslide, Extreme Heat, Tornado, Infestation, Land Subsidence, Volcano, Expansive Soil

De. Jim initiated an evaluation of Table 4-2 of the Plan, Mitigation Goals and Strategic Actions for continued validity and during the ensuing discussion, the Subcommittee came up with several additions, deletions and edits to Goals 1 and 2. Some strategic actions were combined to correct earlier duplication in language; some language was changed for clarification.

E. The next meeting is scheduled for Monday, July 30, 2012. A schedule of future meeting was distributed to members.
F. Jim asked for any public comment; there was no public comment.

G. Stacey moved to adjourn the meeting, Jon seconded the motion and meeting was adjourned.

Respectfully submitted, 3 May 2012

by Daphne D. LaPointe

Nevada Bureau of Mines & Geology

Agenda

Nevada Hazard Mitigation Planning Committee

PLANNING SUBCOMMITTEE

Monday, July 30, 2012, 1:00 pm

Nevada Division of Emergency Management

Executive Conference Room

2478 Fairview Drive, Carson City, NV 89701

DIAL-IN INFORMATION:

DIAL-IN #: 1-888-273-3658

PASS CODE: 8743295

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O. **WELCOME AND INTRODUCTIONS-** *Acting Chair, Rick Diebold*

P. **PUBLIC COMMENTS –** (Discussion only). No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments are limited to 3 minutes unless the Committee elects to extend the comments for purposes of further discussion. Comments will not be restricted based on viewpoint.

Q. (*)**APPROVAL OF MINUTES (for possible action)**: April 30, 2012

R. **UPDATE OF THE STATE HAZARD MITIGATION PLAN** (Discussion only).

a. Review and Input from Members about the Annual Review Questionnaire Information, *Chair, Jim Walker*
b. Collection of the Completed Mitigation Activity/Project Report Forms from Members and Link to the State Hazard Mitigation Plan Goals And Actions, *Acting Chair, Rick Diebold*
c. Input from Members about public awareness and education activities for hazard mitigation planning and action.
d. Review of all edits to Section 3 Hazard Identification and Risk Analysis. *D. LaPointe, Nevada Bureau of Mines and Geology*
e. Discussion and review of the Federal Emergency Management's new requirement for development of a Threat, Hazard Identification and Risk Analysis (THIRA) statewide, *E. Ashby, Nevada Division of Emergency Management (NDEM)*
f. Presentation of the MyPlan website project, *Gary Johnson, NBMG*
g. Review of current risk/vulnerability data *Acting Chair, Rick Diebold*
h. Future expected risk/vulnerability assessment data from the Nevada Bureau of Mines and Geology, *Craig DePolo*
i. Distribution of mitigation goals and strategic actions to expert agencies, Table 4-2, for continued validity in the 2013 plan iteration. *Acting Chair, Rick Diebold*

S. **ANNOUNCEMENT OF TENTATIVE FUTURE MEETINGS** (Discussion only).

Meetings are scheduled the last Monday of the first month in the calendar quarter at 1:00 pm.

a. *Monday, October 29, 2012*
b. *Monday, January 28, 2013*
c. *Monday, April 29, 2013*
d. *Monday, July 29, 2013*
e. *Monday, October 28, 2013*

T. **PUBLIC COMMENTS -** (Discussion only).

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U. **ADJOURN -** (For Possible Action)

This is a public meeting. In conformance with the Nevada Public Meeting law, I Elizabeth Ashby, posted or caused the posting of this agenda on or before Wednesday, July 23, 2012, 9:00 a.m. at the following locations:

Nevada Division of Emergency Management (Carson City); Nevada Bureau of Mines and Geology (Reno);
Clark County Government Center (Las Vegas); Clark County Department of Development Services (Las Vegas)
Clark County Flood Control District (Las Vegas);
And on the website for the Nevada Hazard Mitigation Planning Committee at http://www.nbmg.unr.edu/nhmpc/nhmpc.htm

For further information please contact Jonathan G. Price, State Geologist and Director, Nevada Bureau of Mines and Geology by email at jprice@unr.edu or telephone (775) 784-6691 extension 5.
We are pleased to make reasonable accommodations for members of the public who are disabled. If special arrangements are necessary, please notify the Committee at (775) 687-0314. Twenty-four hours advance notice is requested.

Minutes
Nevada Hazard Mitigation Planning Committee

Special Meeting

Monday, July 30, 2012, 1:00 pm

Division of Emergency Management, Emergency Operations Center Room

2478 Fairview Drive

Carson City, NV 89701

Attendees:
Subcommittee Members:
Rick Diebold, Clark County, Acting Chair
Elizabeth Ashby, Nevada Division of Emergency Management
Marie Barry, Washoe Tribe of Nevada & California
Craig dePolo, Nevada Bureau of Mines and Geology
Bill Elliott, Nevada Division of Emergency Management
Rajat Jain, Nevada Division of Insurance (*via teleconference)*
Karen Johnson, Nevada Division of Emergency Management
D. D. LaPointe, Nevada Bureau of Mines and Geology
Rob Martinez, Nevada Division of Water Resources
Lt. Ryan Miller, Director, Nevada Threat Assessment Center
Peter Mulvihill, State Fire Marshal
Luke Opperman, Nevada Division of Water Resources, (*via teleconference)*
Scott Rasmussen, Nevada Division of Forestry
Michael Rife, State Public Works Division

Guests:
Henna Rasul, State Attorney General's Office
Robert Columbo, Washoe Tribe
Stephanie Hicks, R. O. Anderson Engineering
Josh Taff, Nevada State Hospital Association

As Subcommittee members arrived, Elizabeth ascertained that a quorum of Subcommittee members had been reached so that action items could be officially voted on.

WELCOME AND INTRODUCTIONS

D. Acting Chair Rick Diebold called the meeting to order at 1:10 P.M. and welcomed everyone.

E. Rick read the action statement and asked for any public comment; there was no public comment. He thanked everyone who had come, introduced new Subcommittee members Ryan Miller, Peter Mulvihill, and Scott Rasmussen and asked other Subcommittee members to introduce themselves. He described the Subcommittee's work and its importance to the State and its residents in providing data in the Hazard

Mitigation plan that is essential to various State agencies in securing federal hazard mitigation grants over a three-year cycle

F. APPROVAL OF MINUTES

Rick asked if all had a chance to look at the April NHMP Subcommittee Quarterly meeting minutes that had been distributed and if there were any discussion or changes needed. As there were none noted, he called for a motion to approve the minutes which was made by Karen Johnson, seconded by Mike Rife. All approved and the April NHMP Subcommittee Quarterly meeting minutes were approved as presented.

Da. Rick and Elizabeth summarized the Annual Review Questionnaire form with Subcommittee members who were requested to provide input on answers to questions on the form. They were specifically asked this time to tell the Group of any new hazard studies or maps that might impact mitigation or the plan. Jim and Elizabeth guided the Subcommittee in a review of each question for the first two sections of the form. Several items were brought up by Subcommittee members for consideration that may be incorporated into the next iteration of the Plan:

1. Marie Barry asked if the new USDA Drought Study results recently released would be included or have an impact. Bill Elliott said he would report on that during the Public Comments section at the end of the meeting.
2. Karen asked if adoption of new building codes will have an effect; Peter Mulvihill explained that the Public Works Division would not be changing requirements based on the changes until July of 2013 and they would not take effect until 2014, which would be beyond this iteration of the State Plan. Elizabeth asked how the locals adopt their building codes and Pete said they do their own thing at their own pace, generally following what the state does. Elizabeth asked Marie how the tribes adopt building codes and she said they generally follow the local/county lead. Scott said the Division of Forestry has the SB94 update as a model; the Subcommittee asked if we could get a copy of that update by the next quarterly meeting.
3. Peter said he has NFIRS **(**National Fire Incident Reporting System) data on their Public Works Division website and can get us the link to that data on fire station responses (80 % of all responses are non-fire medical responses; only 7% are real fires) if helpful.
4. Rick Diebold asked if we had any data on the new Interstate highway stretch between Carson City and Reno set to open soon. Our NDOT member, Jim Walker will provide info on that when he returns.
5. Elizabeth said we need data on locations of new fire stations and schools since last plan iteration. Pete says FEMA has a fire dept. census; Craig also said there is a national database of critical infrastructure that should contain that info. Rick D. said he would send a database with any Clark Co. infrastructure critical to recovery (police, fire stations, schools). Ryan Miller will research getting more critical infrastructure location data for our HAZUS runs.
6. There was some discussion of the possible build-up of new infrastructure/buildings in towns such as Winnemucca, Tonopah, Wells, Esmeralda Co., Ely-Eureka Co., since last plan iteration and how to capture that location data. Also is there anything that could be done to mitigate damage by natural hazards in these communities? Probably not – much of it pre-manufactured housing; Pete says his group offers technical assistance.

Db. Rick called for submission of completed Mitigation Activity/Project Reports.

Dc. Rick called for submission of reports on any Public Awareness and Education bearing on mitigation activities.

Dd. D.D. LaPointe described the hazard profiling process and again called for updates to the individual Hazard Profile segments of Section 3 of the 2013 Plan from those Subcommittee members most familiar with the subject matter. We are setting a deadline of October 9th for receipt of all edits, additions, deletions, and changes to these profiles so we can rewrite it and get a final draft of Section 3 in for the Subcommittee to review by the next meeting.

De. Elizabeth reported that in order to comply with Federal Emergency Management's new requirement for development of a statewide Threat, Hazard Identification, and Risk Analysis (THIRA), NDEM has hired a consultant who will do the analysis and make a report that will most likely be incorporated into the Plan as an Appendix.

Df. Gary Johnson was not present since he presented to the Emergency Management Coordinating Council last week, but Craig dePolo summarized his recent work on updating the MyPlan website. NBMG has been incorporating the best information we have on hazards into this map interface online in website for public planners, emergency responders, and other hazard-related professionals to access. It will contain earthquake faults, wildfire data, floodmaps, and soon an expanded earthquake epicenter database and our URM inventory as well as critical infrastructure to give locals and tribes a ~~-o~~ne-stop shop" website for necessary data and an interface for downloading their data. There was discussion of public access or not to the website and how that could be effected in a limited way while still allowing necessary local entities to upload their data to the system. We will work with Gary to see if and how this can be done.

Dg. Rick and Elizabeth reviewed the Plan requirement of assessing the current Mitigation Goals and Strategic Actions for continued validity in the 2013 plan iteration. These apply only to the high-rated hazards of earthquake, flood, and wildfire. These mitigation goals and strategic actions, listed in Table 4-2 of the 2010 Plan, were assigned and distributed to the appropriate Subcommittee members with expertise in evaluating these hazards. Materials will be sent to those not present today.

Dh. Craig dePolo reported that NBMG had recently released its Unreinforced Masonry building inventory for the state. In New Zealand, where 40% of URM construction buildings collapsed in a recent 6.3 earthquake near Christchurch, the government decided to tear down all of its URMS rather than try to retrofit them or live with the threat of damage and injury. Craig said that he has created a short list of Nevada URMS in Winnemucca and Elko of particular concern and is going on a field visit soon to visually inspect and verify them which will provide new URM data to update HAZUS. Another NBMG project will provide new data on risk and vulnerability due to possible failure of canals and aqueducts in the state. He also said that NBMG is developing an earthquake hazard planning scenario for the Las Vegas area will provide valuable data for emergency management exercises and training. One of NBMG's next projects will be to study and inventory non-ductile concrete buildings, which are of concern during earthquakes.

Di. Distribution of mitigation goals and strategic actions *(covered in Dg.)*

E. Rick reviewed future meeting dates as follows, but the meeting time was changed back to 1:30 P.M. instead of 1:00 P.M.

The last Monday of the first month in the calendar quarter at 1:00 pm.
a. Monday, October 29, 2012
b. Monday, January 28, 2013
c. Monday, April 29, 2013
d. Monday, July 29, 2013
e. Monday, October 28, 2013

F. Rick asked for any public comment:

Bill Elliott had the following public comment.

Under the recently changed USDA federal drought criteria, most of Nevada is now officially under D2 severe drought status, and virtually all of Pershing and Churchill Counties are under extreme drought emergency status. This drought emergency enables us to activate SEOC to help citizens. The Drought Monitor website where we can access more drought data is: *http://droughtmonitor.unl.edu/DM_state.htm?NV,W*

There was no other public comment.

Scott Rasmussen moved to adjourn the meeting, Craig dePolo seconded the motion, all were in favor and the meeting was adjourned.

Respectfully submitted, 2 August 2012

by Daphne D. LaPointe

Nevada Bureau of Mines & Geology

Agenda

Nevada Hazard Mitigation Planning Committee

PLANNING SUBCOMMITTEE

Monday, October 29, 2012, 1:00 pm

Nevada Division of Emergency Management

Executive Conference Room

2478 Fairview Drive, Carson City, NV 89701

Identification is Required to Enter the Facility

DIAL-IN INFORMATION:

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PASS CODE: 8743295

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A. WELCOME AND INTRODUCTIONS- *Chair, Jim Walker*

B. **PUBLIC COMMENTS –** (Discussion only). No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments are limited to 3 minutes unless the Committee elects to extend the comments for purposes of further discussion. Comments will not be restricted based on viewpoint.

C. (*)**APPROVAL OF MINUTES (for possible action)**: July 30, 2012

D. **UPDATE OF THE STATE HAZARD MITIGATION PLAN**

a. Review and Input from Members about the Annual Review Questionnaire Information, (Discussion only).*Chair, Jim Walker*

b. Collection of the Completed Mitigation Activity/Project Report Forms from Members and Link to the State Hazard Mitigation Plan Goals and Actions (Discussion only). *Chair, Jim Walker*

c. Input from Members about public awareness and education activities for hazard mitigation planning and action.

d. Review of all edits to Section 3 Hazard Identification and Risk Analysis (Discussion only). *D. LaPointe, Nevada Bureau of Mines and Geology*

e. Presentation of the MyPlan website project (Discussion only). *Gary Johnson, NBMG*

f. Review and recommendation for adoption by the Nevada Hazard Mitigation Planning Committee of the updated profiles for the following hazards **(for possible action)**. *Chair, Jim Walker*

i. Avalanche,
ii. Epidemic,
iii. Expansive Soils,
iv. Hail and Thunderstorm,
v. Infestation,
vi. Land Subsidence,
vii. Tornado, Landslide,
viii. Tsunami/Seiche,
ix. Volcano,
x. Windstorm.

g. Future expected risk/vulnerability assessment data from the Nevada Bureau of Mines and Geology, (Discussion only). *Craig DePolo and Gary Johnson*

h. Distribution of mitigation goals and strategic actions, Table 4-2, to members for review and to expert agencies to take lead on assessment and evaluation for continued validity of goals in the 2013 plan iteration and revisions (Discussion only). *Chair, Jim Walker*

E. ANNOUNCEMENT OF TENTATIVE FUTURE MEETINGS (Discussion only).

Meetings are scheduled the last Monday of the first month in the calendar quarter at 1:00 pm.

a. *Monday, January 28, 2013*
b. *Monday, April 29, 2013*
c. *Monday, July 29, 2013*

F. **PUBLIC COMMENTS -** (Discussion only).

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G. **ADJOURN -** (For Possible Action)

This is a public meeting. In conformance with the Nevada Public Meeting law, I Elizabeth Ashby, posted or caused the posting of this agenda on or before Wednesday, October 24, 2012, 9:00 a.m. at the following locations:

Nevada Division of Emergency Management (Carson City); Nevada Bureau of Mines and Geology (Reno);
Clark County Government Center (Las Vegas); Clark County Department of Development Services (Las Vegas)
And on the website for the Nevada Hazard Mitigation Planning Committee at http://www.nbmg.unr.edu/nhmpc/nhmpc.htm

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Nevada Hazard Mitigation Planning Committee
PLANNING SUBCOMMITTEE
Monday, October 29, 2012, 1:30 pm
Nevada Division of Emergency Management
Executive Conference Room

2478 Fairview Drive, Carson City, NV 89701
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It was ascertained that a quorum of members was not reached so the business of the meeting could not be conducted and official minutes could not be recorded. Some of the planned action items (review and approval of the Hazard Profile Sections will be taken directly to the full NHM planning Committee for action at their next meeting.

Agenda

Nevada Hazard Mitigation Planning Committee

PLANNING SUBCOMMITTEE

Monday, January 28, 2013, 1:30 pm

Nevada Division of Emergency Management

Executive Conference Room

2478 Fairview Drive, Carson City, NV 89701

Identification is Required to Enter the Facility

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A. WELCOME AND INTRODUCTIONS- *Chair, Jim Walker*

B. **PUBLIC COMMENTS –** (Discussion only). No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments are limited to 3 minutes unless the Committee elects to extend the comments for purposes of further discussion. Comments will not be restricted based on viewpoint.

C. (*)**APPROVAL OF MINUTES (for possible action)**: October 29, 2012

D. **UPDATE OF THE STATE HAZARD MITIGATION PLAN**

a. Welcome new member, Kacey KC, from the wildfire field.
b. Review and Input from Members about the Annual Review Questionnaire Information, (Discussion only).*Chair, Jim Walker*
c. Collection of the Completed Mitigation Activity/Project Report Forms from Members and Link to the State Hazard Mitigation Plan Goals and Actions (Discussion only). *Chair, Jim Walker*
d. Input from Members about public awareness and education activities for hazard mitigation planning and action.
e. Distribution and review of updated Section 0 (plan overview and State profile) and Section 1(State legislative authority pertinent to mitigation) **(for possible action)**. *Chair, Jim Walker*
f. Review and recommendation for adoption by the Nevada Hazard Mitigation Planning Committee of the updated profiles for the following hazards **(for possible action)**. *Chair, Jim Walker*
   i. Earthquake
   ii. Wildfire
   iii. Flood (pending irrigation canal data)
   iv. Terrorism/WMD
   v. Hazardous Materials
   vi. Drought
   vii. Severe Winter Storm

g. Update on the future expected risk/vulnerability assessment data from the Nevada Bureau of Mines and Geology, (Discussion only). *Craig DePolo*
h. Review of mitigation goals and strategic actions, Table 4-2, to members for review and to expert agencies to take lead on assessment and evaluation for continued validity of goals in the 2013 plan iteration and revisions (Discussion only). *Chair, Jim Walker*

E. **ANNOUNCEMENT OF TENTATIVE FUTURE MEETINGS** (Discussion only).
Meetings are scheduled the last Monday of the first month in the calendar quarter at 1:30 pm.
a. *Monday, April 29, 2013*
b. *Monday, July 29, 2013*
c. *Monday, October 28, 2013*

F. **PUBLIC COMMENTS -** (Discussion only).

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MINUTES
Nevada Hazard Mitigation Planning Committee
PLANNING SUBCOMMITTEE MEETING
Monday, January 29, 2013, 1:30 pm
Division of Emergency Management
Executive Conference Room
2478 Fairview Drive
Carson City, NV 89701

A. Chair, Jim Walker opened the meeting and welcomed attendees

B. In lieu of introductions, Jim did a roll call and confirmation of quorum. The following members were present:

C.

Jim Walker
Angela Krutsinger
Craig dePolo
Rick Diebold
David Gould
Kacey KC
Mike Rife
Marie Barry
Rob Martinez
Ryan Miller
Peter Mulvihill
Luke Opperman
Rob Palmer (via teleconference)

Also attending were:
Stephanie Hicks
Maureen Martinez
Henna Rasul
Daphne LaPointe
Elizabeth Ashby

D. Jim opened the floor for public comments; there were none.

E. Approval of minutes of the February 2012 meeting was tabled until the April meeting due to a technicality (the wrong minutes date was listed in the agenda).

Eb. Jim reviewed the Annual Review Questionnaire and asked for input from members. He stated this questionnaire is used as a guideline to solicit input and address requirements for the approval of the state hazard mitigation plan.

Ec. Jim reviewed the Mitigation Activity/Project Report Forms and their linkage to the State Hazard Mitigation Plan Goals and Actions with members and requested that they submit these to Elizabeth and D.D. for inclusion in the plan. *Luke asked if there were any flood-related activities that had been previously submitted on these forms and were they available in the plan as he had been researching that information and had a hard time finding it. Several members volunteered that they had information to report and would file it soon He was reminded that this section is exclusive to the hazard profile and the issues he asked about are included in other sections of the plan to be reviewed in future meetings. Luke also asked about the availability of state funds for mitigation purposes. Currently, no state funding to support hazard mitigation activities exist. Members continued the discussion with a request for State Public Works to provide feedback on mitigation activities completed for state facilities. Both Maureen and David agreed with Mike Rife to forward details to DD and Elizabeth regarding Capital Improvement Projects completed from 2010 to 2012 for inclusion in the plan. Angela will provide information about Nevada's hospitals completed mitigation activities based on the Silver Shield Initiative. Marie asked if the Governor's Emergency Declaration allowing extended hours for Propane Tank drivers should be included. The consensus of the group was to include the declaration under historical events of the Severe Weather profile.*

Ed. Jim solicited input from Members about public awareness and education activities for hazard mitigation planning and action that they had done. Request that they track those on a separate form. Several members volunteered information that they will report and file. Peter Mulvihill alerted the group to the annual wildfire awareness week coming up in May.

Ee. Copies of updated Section 0 (Plan Overview and State Profile) and Section 1(State legislative authority pertinent to mitigation) were distributed and reviewed by committee members. There was discussion of minor revisions (deleting last column of Table 0-1; adding reason for 2010 tribal census data). Jim called for a motion to accept and adopt Updated Sections Zero and One as revised. Peter Mulvihill made the motion, seconded by Angela Krutsinger; all were in favor, none opposed. The motion passed unanimously.

Ef. The updated profiles of each of several medium/significant and high-risk hazards were presented to the Subcommittee for review and recommendation for adoption: Each was discussed individually and Subcommittee members with expertise on the various hazards offered their suggested edits. Jim reminded the Subcommittee that, to simplify the review of the hazard profile section, the vulnerability analysis in each of the wildfire, flood and earthquake profiles will be moved to the end of Section 3.

1. Earthquake: Craig dePolo updated us on status of HAZUS runs to be included in vulnerability analysis section
2. Wildfire. This section was basically all right as written
3. Flood (pending irrigation canal data) Craig dePolo updated us on status of HAZUS runs to be included in vulnerability analysis section. Luke had questions regarding lack of specifics on what communities can do, and availability of state funding. He was reminded that this is simply the hazard profile section and those issues are dealt with in other sections of the plan.

4. Terrorism/WMD. There were many questions and comments on this section and language and structure. The planning team will work with Ryan Miller to rewrite it. Angela will also provide data about the State Public Health laboratory testing for epidemiological purposes.
5. Hazardous Materials. This section has had a lot of new material added and Rob Palmer would like one more go at helping to make it flow better and tweaking a few details before finalizing it. Pete Mulvihill had input regarding additional railroad tracks in northern Nevada possibly being restored for use in new mining ventures.
6. Drought . Basically OK with updating of website adds-ins and dates of figures.
7. Severe Winter Storm

After discussion and editorial suggestions to the planning team from the committee, Angela Krutsinger initiated a motion to accept and adopt the following hazard profiles with changes as discussed.

Wildfire
Earthquake
Flood (with the amendment of the irrigation ditch/canal analysis at a later date)
Drought
Severe winter storm

Mike Rife seconded the motion and it carried with no dissenting votes.

The other two hazard profile sections presented will be revised and edited with the help of expert Subcommittee member input and presented at a future meeting or webinar for approval.

Eg. Craig dePolo gave the Subcommittee a brief update on the status of the NBMG HAZUS run data for the risk/vulnerability assessment earthquake and flood sections of the plan. Most of the earthquake runs have been completed, but not the flood HAZUS runs, which will be done for the Truckee, Carson, Walker, Humboldt, Virgin, Muddy, and part of the Colorado Rivers. As for the canal and ditch information for flooding, he is trying to get a graduate student to do a GIS project that creates an algorithm to translate the canal/ditch location data into adjacent flooding area data. This work needs to be completed and relayed to us by May. Luke suggested using the U.S. ACE algorithm currently being used for the Churchill County study.

Eh. The review of mitigation goals and strategic actions will be tabled until another meeting when members will be asked to review and expert agencies to take lead on assessment and evaluation for continued validity of goals in the 2013 plan iteration and revisions for Flood, Earthquake and Wildfire. We may meet to accomplish this and other work before the next scheduled April meeting, by teleconference using the Nevada Division of Emergency Management and Rick Diebold's Las Vegas meeting room as our public fora.

F. Jim announced the dates of future meetings scheduled the last Monday of the first month in the calendar quarter at 1:30 pm. on
   a. Monday, April 29, 2013
   b. Monday, July 29, 2013

c. Monday, October 28, 2013

G. Jim again opened the floor for public comments; there were none

H. Jim called for a motion to adjourn, Angela Krutsinger proposed the motion, seconded by David Gould, all were in favor and the meeting was adjourned

Respectfully submitted, Daphne LaPointe,
Nevada Bureau of Mines and Geology,
January 29, 2013

Nevada Hazard Mitigation Planning Committee
PLANNING SUBCOMMITTEE
Monday, April 29, 2013, 1:30 pm
Nevada Division of Emergency Management
Executive Conference Room

2478 Fairview Drive, Carson City, NV 89701

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A. **WELCOME AND INTRODUCTIONS-** *Chair, Jim Walker*

B. **ROLL CALL AND CONFIRMATION OF A QUORUM** *Chair, Jim Walker*

C. **PUBLIC COMMENTS –** (Discussion only). No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments are limited to 3 minutes unless the Committee elects to extend the comments for purposes of further discussion. Comments will not be restricted based on viewpoint.

D. (*)**APPROVAL OF MINUTES (for possible action)**: January 28, 2013

E. **UPDATE OF THE STATE HAZARD MITIGATION PLAN**
- a. Review and Input from Members about the Annual Review Questionnaire Information, (Discussion only).*Chair, Jim Walker*
- b. Collection of the Completed Mitigation Activity/Project Report Forms from Members and Link to the State Hazard Mitigation Plan Goals and Actions (Discussion only). *Chair, Jim Walker*
- c. Input from Members about public awareness and education activities for hazard mitigation planning and action.
- d. Distribution and review of updated Section 5 (Local Coordination) and Section 8 (Complying with the enhanced plan requirements demonstrating Nevada's commitment to hazard mitigation) **(for possible action)**. *Chair, Jim Walker*
- e. Review and recommendation for adoption by the Nevada Hazard Mitigation Planning Committee of the updated profiles for the following hazards **(for possible action)**. *Chair, Jim Walker*
  - i. Terrorism/WMD
  - ii. Hazardous Materials
- f. Distribution of current hazard mitigation goals and action items for the earthquake, wildfire and flood hazards to review and update by the lead agencies. (Discussion only).
  - i. Process and requirements for updating action items
- g. Update on the future expected risk/vulnerability assessment data from the Nevada Bureau of Mines and Geology, (Discussion only). *Craig DePolo*

F. **ANNOUNCEMENT OF TENTATIVE FUTURE MEETINGS** (Discussion only).
Meetings are scheduled the last Monday of the first month in the calendar quarter at 1:30 pm.
- *a.* *Monday, July 29, 2013*
- *b.* *Monday, October 28, 2013*

G. **PUBLIC COMMENTS -** (Discussion only).

No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments are limited to 3 minutes unless the Committee elects to extend the comments for purposes of further discussion. Comments will not be restricted based on viewpoint.

H. **ADJOURN -** (For Possible Action)

This is a public meeting. In conformance with the Nevada Public Meeting law, I Elizabeth Ashby, posted or caused the posting of this agenda on or before Wednesday, April 22, 2013, 9:00 a.m. at the following locations:

Nevada Division of Emergency Management (Carson City); Nevada Bureau of Mines and Geology (Reno);
Clark County Government Center (Las Vegas); Clark County Department of Development Services (Las Vegas)
And on the website for the Nevada Hazard Mitigation Planning Committee at http://www.nbmg.unr.edu/nhmpc/nhmpc.htm

For further information please contact Elizabeth Ashby, State Hazard Mitigation Officer, Nevada Division of Emergency Management by email at eashby@dps.state.nv.us or telephone (775) 687-0314. We are pleased to make reasonable accommodations for members of the public who are disabled. If special arrangements are necessary, please notify the Committee at (775) 687-0314. Twenty-four hours advance notice is requested.

Minutes

Nevada Hazard Mitigation Planning Subcommittee Meeting

Monday, April 29, 2013, 1:30 pm

Division of Emergency Management, Emergency Operations Center Room

2478 Fairview Drive

Carson City, NV 89701

Attendees:
Subcommittee Members:
James Walker, NDOT
Rick Diebold, Clark County, Acting Chair
Craig dePolo, Nevada Bureau of Mines and Geology
Bill Elliott, Nevada Division of Emergency Management
Stacey Giomi, Carson City Fire Dept.
Rob Martinez, Nevada Division of Water Resources
Peter Mulvihill, State Fire Marshal
Scott Rasmussen, Nevada Division of Forestry
Michael Rife, State Public Works Division
David Gould, Safety Specialist Consultant
Angela Krutsinger, Director of Hospital Preparedness

Via Teleconference:

Dr. Keith Forbes, NV Dept. Agric.
Rajat Jain, Nevada Division of Insurance
Rob Palmer, NDCNR
Chris Smallcomb, Warning Coordination Meteorologist

NDEM/NHMP Staff
Elizabeth Ashby, Nevada Division of Emergency Management
Karen Johnson, Nevada Division of Emergency Management
Daphne LaPointe, Nevada Bureau of Mines and Geology
Janell Woodward, Nevada Division of Emergency Management

Guests:
Henna Rasul, State Attorney General's Office
Stephanie Hicks, R. O. Anderson Engineering

G. WELCOME AND INTRODUCTIONS. Chair Jim Walker called the meeting to order at 1:30 P.M., welcomed all.
H. Attendees introduced themselves around the table and on teleconference and it was ascertained that a quorum of Subcommittee members were present so that action items could be officially voted on.

I. Jim asked for any public comment and there was no public comment.
J. Jim asked if all had a chance to look at the January NHMP Subcommittee Quarterly meeting minutes that had been distributed and if there were any discussion or changes needed. As there were none noted, he called for a motion to approve the minutes. Stacey moved to approve, seconded by Mike Rife. All approved and the January 2013 NHMP Subcommittee Quarterly meeting minutes were approved as presented.

Ea. Jim summarized the Annual Review Questionnaire form and members were requested to provide input on answers to questions on the form. They were specifically asked this time to tell of any changes to goals and objectives to the NHMP, which will be discussed below.
Eb. Jim called for completed Mitigation Activity/Project Report forms.
Craig asked when they are due and Elizabeth said we could accept them for another month, end of May. Stacey Giomi, Mike Rife, and Peter Mulvihill discussed submission of model building and fire code data in writing by the end of the month. Currently local governments in the state are adopting 2012 codes.
Ec. The Planning Team called for input from members on public awareness and education activities and Elizabeth handed out forms for tracking these activities to those who lacked them. Elizabeth gave examples.
Ed. Jim distributed Sections 5 and 8 of the Enhanced NHMP for review and possible action. The subcommittee decided to act on each section separately. There were minor suggestions to add more definitions of terms and acronyms in Section 5. Peter Mulvihill moved to approve Section 5 as amended, Angela seconded the motion, there was no more discussion, all approved and the motion was passed.
On section 8, Peter Mulvihill submitted in writing some suggested edits to the building and fire code portion of section 8 and explained his edits. Rick asked for a definition of the term —ground truthing" of potential URMs, Craig explained and it was decided that —field verification" was a more easily understood and accurate terminology to use. There was additional discussion of classes that will be available for the rapid visual inspection of URMs and forms to make it quick and easy to do.
FEMA- NEEHRP-offering training for valuation of building safety – all we have to do is provide a venue – doing it in Las Vegas. Rick Diebold will host one in Southern Nevada
Angela added that Region IX is revamping its earthquake plan too. She pointed out a minor typo on p. 8-8 and a capitalization error on 8-13 to be fixed.
Rob asked if the footer would be changed to the current date (yes) and if the Sun Valley project would be included or if we had any Severe Repetitive Loss properties in Nevada (no) Karen pointed out that more detail on specific projects will be found in Section 4 which is not yet completed.
Jim asked for any more discussion of changes to Section 8; Bill Elliott moved to approve Section 8 with the corrections suggested by the Subcommittee; Dave Gould seconded the motion. There was no additional discussion, and the motion was approved unanimously.
Ee. The hazard profiles subsections of Section 3 on Terrorism and Weapons of Mass Destruction and on Hazardous Materials were both presented to the Subcommittee for approval. Ryan Miller had significant input on the Terrorism and Weapons of Mass Destruction Subsection; and Rob Palmer worked very

hard writing and editing the Hazardous Materials Subsection. Both profiles now finally meet their strict guidelines and those of their respective agencies. We do not feel we should make any substantive changes in the content of these sections lest we make them unacceptable to those groups. Jim asked for any comments or discussion on these profiles. Angela commented that the State Health Division had recently reduced the radiological /nuclear capabilities drastically in recent months and asked if this would have any effect on these subsections. We replied that no, since these are the profiles, and not the capabilities sections, there should be no effect whatsoever on these profile sections. Rick Diebold made a motion to approve the two profile subsections, Craig dePolo seconded the motion, there was no additional; discussion, and the motion was approved by all.

Ef. The Goals and Strategic Actions from Section 4 of the NHMP were distributed in tabular form to the pertinent Subcommittee members for their review and input; Wildfire - Scott Rasmussen; Earthquake - Craig dePolo; Flood-Rob Martinez and Kim Davis (not present)

With a request to return their edits and changes and additions by Friday May 10th. Elizabeth listed the key people for input.

Elizabeth mentioned that we will be moving into a 5-year cycle for NHMP plan updating instead of the current 3-year cycle.

Eg. Craig dePolo gave us an update on future of expected risk/vulnerability assessment data from NBMG. He said they have done HAZUS studies for 35 communities in the state and found that costs are reduced for 32 of those communities. Example: Wells went from as estimated $32 million to actual $15 million to current estimate of $2.2 million. Elizabeth asked if this was due to a change in the program used? Craig said that the —fragility curve changed but that it should have been offset by URM data, so they are reviewing the data now to find answers.

Craig is working on Douglas County's Hazard Mitigation plan. There are 8 main faults isolated and he is doing HAZUS studies on each one based on historic liquefaction, shaking, etc. They recommend adoption of current building codes and adding field verification of URMs. Also EQ cataloguing will be done in June – and added to MyPlan – add 110,000 faults. Reno Flood project? Zone maps? No – will meet with City & County soon to plan out scope of work…..

Jim – Future meetings:

Monday, July 29, 2013
Monday, October 28, 2013
And possibly a special meeting to finalize the plan document, but no set date on that yet.

We need a full committee vote on the final plan August 13th in Southern Nevada.

G. Jim asked for any public comment; there was none.
H. The meeting was adjourned.

Respectfully submitted, 6 May 2013 by Daphne D. LaPointe

Nevada Bureau of Mines & Geology

STATE OF NEVADA
MEETING NOTICE AND AGENDA
Nevada Hazard Mitigation Planning Committee

Name of Organization: Nevada Hazard Mitigation Planning Subcommittee
Meeting Location: Governor's Office of Energy, Conference Room: 755 N. Roop Street, Suite 202, Carson City, Nevada. (PLEASE NOTE NEW LOCATION)

Date and Time of Meeting: Monday, July 29, 2013, 1:30 pm

DIAL-IN INFORMATION: TELEPHONE NUMBER: 1-888-273-3658; PASS CODE: 8743295

This meeting will begin at the location specified above beginning at 1:30 pm. The Subcommittee may take action on items marked "For Possible Action." Items may be taken out of the order presented on the agenda at the discretion of the chairperson. Items may be combined for consideration by the Subcommittee at the discretion of the chairperson. Items may be pulled or removed from the agenda at any time.

Please Note: Witnesses wishing to have their complete testimony/handouts included in the permanent record of this meeting should provide a written or electronic copy to the Subcommittee members. Minutes of the meeting are produced in a summary format and are not verbatim.

1. **CALL TO ORDER, ROLL CALL AND ESTABLISH QUORUM** – *Chair, Jim Walker*

2. **PUBLIC COMMENT**– (Discussion only) – No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments may be limited to 3 minutes per person at the discretion of the Chair. Comments will not be restricted based on viewpoint. *Chair, Jim Walker*

3. **APPROVAL OF THE MEETING MINUTES FROM April 29, 2013** (For possible action) – *Chair, Jim Walker*

4. **UPDATE OF THE STATE ENHANCED HAZARD MITIGATION PLAN (NHMP)** (For possible action) – *Chair, Jim Walker*

    a. Review and Input from Members about the Annual Review Questionnaire Information, (Discussion only) *Chair, Jim Walker*

b. Collection of the Completed Mitigation Activity/Project Report Forms from Members and Link to the State Hazard Mitigation Plan Goals and Actions (Discussion only). *Chair, Jim Walker*

c. Collection of reports on public awareness and education activities on hazard mitigation planning and actions from Members. *Chair, Jim Walker*

d. Members' ranking of Mitigation Strategic Actions using FEMA's Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) criteria to be included in Section 4 below. *Planning Team lead, Elizabeth Ashby*

e. Distribution and review of remaining updated Section 3 profile on Flood hazard of the 2013 Enhanced NHMP and recommendation for adoption by the Nevada Hazard Mitigation Planning Committee **(for possible action)**. *Chair, Jim Walker*

f. Distribution and review of remaining Sections 2013 Enhanced NHMP and recommendation for adoption by the Nevada Hazard Mitigation Planning Committee **(for possible action)**. *Chair, Jim Walker*

i. Section 3. Vulnerability Analysis
ii. Section 4. Capability Assessment and Mitigation Strategy
iii. Section 6. Plan Maintenance Process

g. Distribution and review of Appendices of the 2013 Enhanced NHMP and recommendation for adoption by the Nevada Hazard Mitigation Planning Committee **(for possible action)**. *Chair, Jim Walker*

5. Update on the future expected risk/vulnerability assessment data from the Nevada Bureau of Mines and Geology, (Discussion only). *NBMG, Craig DePolo*

6. **PUBLIC COMMENT** (Discussion only)– No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments may be limited to 3 minutes per person at the discretion of the Chair. Comments will not be restricted based on viewpoint.

7. **ADJOURN** – (For possible action)

This is a public meeting. In conformance with the Nevada Public Meeting Law, this agenda was posted or caused to be posted on or before 9:00 a.m. on July 22, 2013 at the following locations:

Las Vegas Grant Sawyer Building, 555 E. Washington Avenue,
Las Vegas, NV; Carson City Governor's Office, 101 N. Carson Street, Carson City, NV;
NV State Emergency Operations Center, 2478 Fairview Drive, Carson City, NV;

Clark County Development Services, 4701 West Russell Road, Las Vegas, NV
Posted to the NV Department of Public Safety Division of Emergency Management and Homeland Security web site located at: **http://dem.nv.gov/**

We are pleased to make reasonable accommodations for members of the public who are disabled. If special arrangements for the meeting are necessary, please notify the Division of Emergency Management at (775) 687-0300. 24-hour advance notice is requested. Thank you.

For further information about supporting documentation, please contact Elizabeth Ashby, SHMO, Nevada Division of Emergency Management (NDEM) by email at eashby@dps.state.nv.us (775) 687-0314. Supporting documentation is stored at NDEM, 2478 Fairview Dr., Carson City, NV 89701

Minutes

Nevada Hazard Mitigation Planning Subcommittee Meeting

Monday, July 29, 2013, 1:30 pm

Governor's Office of Energy, Conference Room
755 N. Roop Street, Suite 202, Carson City, Nevada

Attendees:

Subcommittee Members:
Marie Barry, Washoe Tribe of Nevada & CA
Jenna Damon, Nevada Division of Water Resources
Craig dePolo, Nevada Bureau of Mines and Geology
Rick Diebold, Clark County
Stacey Giomi, Carson City Fire Dept.
David Gould, Safety Specialist Consultant
Rajat Jain**,** Nevada Division of Insurance
Angela Krutsinger, Director of Hospital Preparedness
Rob Martinez, Nevada Division of Water Resources
Ryan Miller, Nevada Threat Assessment Center
Peter Mulvihill, State Fire Marshal
Scott Rasmussen, Nevada Division of Forestry
Michael Rife, State Public Works Division

Via Teleconference:

Bill Elliott, Nevada Division of Emergency Management
Robin Palmer, NV Dept of Conservation & Natural Resources
Chris Smallcomb, Warning Coordination Meteorologist

NDEM/NHMP Staff
Elizabeth Ashby, Nevada Division of Emergency Management
Daphne LaPointe, Nevada Bureau of Mines and Geology
Janell Woodward, Nevada Division of Emergency Management

Guests:
Henna Rasul, State Attorney General's Office

K. **CALL TO ORDER, ROLL CALL AND ESTABLISH QUORUM.** In the absence of Chair Jim Walker, State Hazard Mitigation Officer Elizabeth Ashby led the meeting. Elizabeth called the meeting to order at 1:35 P.M. and welcomed all. Elizabeth did a roll call of attendees and those on teleconference and ascertained that a quorum of Subcommittee

members were present to carry on the business of the Subcommittee and vote on action items.

L. **PUBLIC COMMENT.** Elizabeth opened the floor for any public comment but there was none.

M. **APPROVAL OF THE MEETING MINUTES FROM April 29, 2013.** Elizabeth asked if all had a chance to look at the April 29th NHMP Subcommittee Quarterly meeting minutes that had been distributed and if there were any discussion or changes needed. As there were none noted, Stacey Giomi moved to approve the minutes as presented. Rick Diebold seconded the motion, Elizabeth called for any discussion, all were in favor, none opposed, and the motion to approve the April 29th Subcommittee Quarterly meeting minutes passed as presented.

N. **UPDATE OF THE STATE ENHANCED HAZARD MITIGATION PLAN (NHMP) taken out of order presented on the agenda due to time constraints of some members who may have to leave early).**

4d. Members' ranking of Mitigation Strategic Actions using FEMA's Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) criteria to be included in Section 4. Elizabeth made sure all members had copies of the STAPLEE worksheet showing current status of rankings of strategic actions based on returns received and explained that we need remaining Subcommittee member rankings by the end of Wednesday July 31 in order to have all members' input for the prioritization. We will set a date for a special meeting in late August to finalize prioritizations into the "High," "Medium," and "Low" categories based upon the expertise of Subcommittee members.

4e. Distribution and review of remaining updated Section 3 profile on Flood hazard (including "Canals and Ditches" subsection) of the 2013 Enhanced NHMP and recommendation for adoption by the Nevada Hazard Mitigation Planning Committee. There was some discussion on this section; Rob Martinez asked Craig if he had consulted any of the irrigation companies in the state about the ditches to get data? Craig said no, the scope of this study will be confined to just the ditches in the Reno area and are just looking at: 1. Setting, 2. Conditions, 3. Downstream hazards, and 4. Avoiding operations such as storm runoff diversion into ditches causing flood overflow. They will be modeling potential runoff into each section of the ditches to see how many inches per hour of rainfall does it take to overwhelm it?
Marie Barry mentioned that Ed James had done some work in Douglas County to study results of ditch opening vs. closing during flood events - Craig might want to look into that or contact him.
Stacey Giomi suggested that we add a final column to Table 3-16 showing NFIM claims as a percentage of total claims, which we will add as an edit. Others had minor typographical edits that were handed in to the Planning Team.

Rick Diebold made a motion to approve the Section 3 flood profile section with added canal and ditch subsection, with suggested edits by the

Subcommittee. Angela Krutsinger seconded the motion; Elizabeth called for any more discussion and there was none. She called for a vote, and all were in favor, none opposed, and the motion carried as presented to approve the Section 3 flood profile section with added canal and ditch subsection, with suggested edits by the Subcommittee.

4fi. Elizabeth distributed to all members for review and discussion copies of the remaining Vulnerability Assessment subsection of Section 3 of the 2013 Enhanced NHMP. There was some discussion first of Table 3-35 – a table of potential losses due to wildfire. There was a question of what constituted losses, and it was determined to be solely building stock losses, from assessors' data. Marie Barry noted the lack of data on some tribal lands and said she would provide us some data to fill in some of those for the Washoe Tribal lands. Some members provided us a few minor suggested typographic and semantic language edits handed to the Planning Team. Craig suggested that we use the 2009 HAZUS run data for earthquake losses rather than the suspect 2013 HAZUS program run data that gave unrealistic loss numbers for many communities. This was discussed among the committee and most agreed that it was wiser to err on the high side with the older 2009 numbers than on the low side with the 2013 numbers. There is a new ~~fi~~xed" version of HAZUS FEMA has released that may have rectified some of the problems but it is too most likely too late to redo all the HAZUS runs, analyze the data and incorporate it into the plan if it is good at this late date. Craig will let us know if any new runs are completed, however.
The only major change to the flood subsection of the Vulnerability Assessment was the addition of the Colorado River data on the portion that flows through Nevada. Elizabeth had another question for Craig on whether we could still use the same HAZUS Earthquake Maps showing peak ground acceleration for HAZUS scenario earthquakes in Appendix F. Craig was not sure and would check on this.
The Subcommittee decided to postpone a vote on approval of this Vulnerability Assessment subsection of Section 3 of the 2013 Enhanced NHMP until the Special Meeting at the end of August because of the many uncertainties left to be decided on this.

4fii.Elizabeth opened review and discussion of the Mitigation Strategy, Section 4 of the 2013 Enhanced NHMP.
The Planning Team made no changes to the major Goals, but did make some changes to the Strategic Action Items as noted:

- Changed language on a few; mainly to show completion of some and add ~~—~~maint~~e~~nance" to language.
- Deleted a few that have been completed or are no longer applicable.
- Added several to conform to the goals and objectives of the NESC.

The Section will be completed when the Strategic actions are finally prioritized by the Subcommittee members at the late August Special meeting and incorporated into the Strategic Action Plan Matrix in Table 4-10 at the end of the Section. There were several minor suggested edits made by Subcommittee members to Table 4-3. —Preand Post-Disaster Hazard Management Policies, Programs, and Capabilities" in the Capability Assessment subsection of Section 4, noted by the Planning Team members who will make the recommended changes.

Dave Gould made a motion to approve Section Four with the recommended edits to Table 4-3 and incorporation of the new rankings of Strategic Action items into Tables 4-2 and 4-10. Peter Mulvihill seconded the motion, Elizabeth called for any more discussion and there was none. She called for a vote, and all were in favor, none opposed, and the motion carried as presented to approve Section 4, Mitigation Strategy section with suggested edits and prioritizations to be finalized by the Subcommittee at the late August Special Meeting.

4fiii. Elizabeth opened discussion of Section 6, Plan Maintenance section of the NHMP, describing that there was very little if any change to it at all; mainly just language change to keep it in conformance with other sections.

Rick Diebold made a motion to approve Section 6, Plan Maintenance as presented. Stacey Giomi seconded the motion, Elizabeth called for any more discussion and there was none. She called for a vote, and all were in favor, none opposed, and the motion carried as presented to approve Section 6, Plan Maintenance section of the NHMP.

4g. Elizabeth opened discussion of the Appendices, which were not copied for the meeting; members viewed the completed ones online. Several do not yet have links and material is incomplete on some. The Planning Team will continue to update the Appendices and post them on the NHMPC website and inform members when final updates are available online for review. No action was taken.

Elizabeth requested a motion to send the approved sections of the NHMP to the full NHMP committee for suggested approval at their meeting on August 13th. Rick Diebold so moved, Peter Mulvihill seconded the motion, all were in favor, none opposed, and the motion carried.

We looked at calendars and agreed upon a possible date of Monday August 26th for a Special meeting of the Subcommittee *(later changed to Thursday August 29th)* back to our original meeting place at the executive conference room of the NDEM.

5d. Craig reported on the status of the future expected risk/vulnerability assessment data from the Nevada Bureau of Mines and Geology. FEMA has provided a ~~–ix~~" program to hopefully rectify some of the inaccuracies in its earthquake HAZUS runs, but NBMG has not yet had time to do the runs and compare the data with known results to see how good they are.
He said they are working on an Earthquake Catalogue for MyPlan. As for the status of the Ditch and Canal study, Craig is working with Greg Pohll at DRI to come up with a plan of attack to yield a report by the end of the year on the Steamboat Ditch. He has submitted a proposal to Elizabeth for the work.

Elizabeth: – Future meetings:
Thursday, August 29, 2013 Special Meeting
Monday, October 28, 2013

6. Elizabeth opened the floor for any public comment; there was none.

7. As there were no other items for discussion or action, Angela Krutsinger moved to adjourn the meeting, the motion was seconded by Peter Mulvihill, all were in favor, and the meeting was adjourned.

Respectfully submitted, 6 August 2013

by Daphne D. LaPointe

Nevada Bureau of Mines & Geology

STATE OF NEVADA
MEETING NOTICE AND AGENDA
Nevada Hazard Mitigation Planning Committee

Name of Organization: Nevada Hazard Mitigation Planning Subcommittee
Meeting Location: Nevada Division of Emergency Management, State Emergency Operations Center (SEOC); 2478 Fairview Drive, Carson City, Nevada.

Date and Time of Meeting: Thursday, August 29, 2013, 1:30 pm

DIAL-IN INFORMATION: TELEPHONE NUMBER: 1-888-273-3658; PASS CODE: 8743295

This meeting will begin at the location specified above beginning at 1:30 pm. The Subcommittee may take action on items marked "For Possible Action." Items may be taken out of the order presented on the agenda at the discretion of the chairperson. Items may be combined for consideration by the Subcommittee at the discretion of the chairperson. Items may be pulled or removed from the agenda at any time.

Please Note: Witnesses wishing to have their complete testimony/handouts included in the permanent record of this meeting should provide a written or electronic copy to the Subcommittee members. Minutes of the meeting are produced in a summary format and are not verbatim.

8. CALL TO ORDER, ROLL CALL AND ESTABLISH QUORUM – *Chair, Jim Walker*

9. PUBLIC COMMENT– (Discussion only) – No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments may be limited to 3 minutes per person at the discretion of the Chair. Comments will not be restricted based on viewpoint. *Chair, Jim Walker*

10. APPROVAL OF THE MEETING MINUTES FROM July 29, 2013 (For possible action) – *Chair, Jim Walker*

11. UPDATE OF THE STATE ENHANCED HAZARD MITIGATION PLAN (NHMP) (For possible action) – *Chair, Jim Walker*

h. Discussion, Review and approval of the ranking for the hazard mitigation actions - *Chair, Jim Walker*

12. **PUBLIC COMMENT** (Discussion only)– No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments may be limited to 3 minutes per person at the discretion of the Chair. Comments will not be restricted based on viewpoint.

13. **ADJOURN** – (For possible action)

This is a public meeting. In conformance with the Nevada Public Meeting Law, this agenda was posted or caused to be posted on or before 9:00 a.m. on August 22, 2013 at the following locations:

Las Vegas Grant Sawyer Building, 555 E. Washington Avenue,
Las Vegas, NV; Carson City Governor's Office, 101 N. Carson Street, Carson City, NV;
NV State Emergency Operations Center, 2478 Fairview Drive, Carson City, NV;
Clark County Development Services, 4701 West Russell Road, Las Vegas, NV
Posted to the NV Department of Public Safety Division of Emergency Management and Homeland Security web site located at: **http://dem.nv.gov/**

We are pleased to make reasonable accommodations for members of the public who are disabled. If special arrangements for the meeting are necessary, please notify the Division of Emergency Management at (775) 687-0300. 24-hour advance notice is requested. Thank you.

For further information about supporting documentation, please contact Elizabeth Ashby, SHMO, Nevada Division of Emergency Management (NDEM) by email at eashby@dps.state.nv.us (775) 687-0314. Supporting documentation is stored at NDEM, 2478 Fairview Dr., Carson City, NV 89701

Minutes

Nevada Hazard Mitigation Planning Subcommittee Meeting

Thursday, August 29, 2013, 1:30 pm

Division of Emergency Management State Emergency Operations Center
2478 Fairview Drive, Carson City, Nevada 89701

Attendees:

Subcommittee Members:
Jenna Damon, Nevada Division of Water Resources
Craig dePolo, Nevada Bureau of Mines and Geology
Rob Martinez, Nevada Division of Water Resources
Peter Mulvihill, State Fire Marshal
Michael Rife, State Public Works Division
Jim Walker, Department of Transportation

Via Teleconference:
Marie Barry, Washoe Tribe of Nevada & CA
Rick Diebold, Clark County
Stacey Giomi, Carson City Fire Dept.
David Gould, Safety Specialist Consultant

NDEM/NHMP Staff
Elizabeth Ashby, Nevada Division of Emergency Management
Daphne LaPointe, Nevada Bureau of Mines and Geology
Janell Woodward, Nevada Division of Emergency Management

Guests:
Henna Rasul, State Attorney General's Office

O. **CALL TO ORDER, ROLL CALL AND ESTABLISH QUORUM.** Jim Walker, Chair, called the meeting to order. Elizabeth Ashby called roll and a quorum was present.

P. **PUBLIC COMMENT.** Jim Walker asked for public comment; there were none.

Q. **APPROVAL OF THE MEETING MINUTES FROM July 29, 2013.** Jim Walker asked if there was any discussion regarding the minutes from the prior meeting of July 29, 2013. There was no discussion. Mike Rife made a motion to accept the minutes as submitted and Rob Martinez seconded. The minutes were approved unanimously.

R. **UPDATE OF THE STATE ENHANCED HAZARD MITIGATION PLAN (NHMP).** Jim Walker stated the reason for the special meeting was to approve the ranking

of actions for the hazard mitigation plan. Jim asked for any discussion from board members. DD LaPointe pointed out that they had changed a small portion of the wording due to a change in definition by FEMA regarding repetitive loss and severe repetitive loss. This change was made to be in line with FEMA's definition. Elizabeth Ashby introduced Jenna Damon to the group who entered the meeting after it started. Elizabeth also gave Rajat Jain's comment that he agreed with the current ranking. Peter Mulvihill made a motion to accept the ranking and Mike Rife seconded. There was no discussion. The ranking was approved unanimously. Several members commented that everyone did a very good job giving feedback, taking feedback and integrating into the plan.

Jim Walker stated we will be in contact with the committee to identify when the next meeting will be held. The committee will likely take a short break before the updating process starts all over again.

8. **PUBLIC COMMENT.** Jim Walker asked for any public comment; there were none.

9. **ADJOURN.** Jim Walker adjourned the meeting.

Respectfully submitted, 3 September 2013

by Janell Woodward

Nevada Division of Emergency Management

Agenda
Nevada Hazard Mitigation Planning Committee
Thursday, February 10, 2011, at 9:30 am
Lyon County Administrative Building, 27 South Main Street, Yerington, Nevada

The Committee may take action on items marked by an asterisk (*). Items may be taken out of order presented on the agenda at the discretion of the chairperson.

A. **CALL TO ORDER AND INTRODUCTIONS** – *Chairman, Jon Price* Confirm Quorum

B. **APPROVAL OF MEETING MINUTES FROM NOVEMBER 18, 2010 MEETING*** – *Chairman, Jon Price*

C. **LYON COUNTY PRESENTATION REGARDING THE DEMOGRAPHICS, GOVERNMENT, GEOGRAPHY, ECONOMIC AND SOCIAL PROFILE OF THE COUNTY**- *Presenter Jeff Page & Rob Loveberg, Lyon County*

D. **EARTHQUAKE HAZARD IN LYON COUNTY PRESENTATION –** Earthquake HAZUS-MH* Report - *Jon Price, NV State Geologist*

E. **FLOOD HAZARD in LYON COUNTY PRESENTATION –** Areas of Concern and Maps – *Presenter Jeff Page & Rob Loveberg, Lyon County*

F. **REVIEW OF NATIONAL HAZARD MITIGATION ASSISTANCE GRANT APPLICATION EVALUATION PROCESS –** Discussion by participants of January Session - *Jon Price, NV State Geologist, Kim Groenewold, NV State Flood Plain Manager, John Pickett, Forester Tahoe Douglas Fire District*

G. **DAM SAFETY PRESENTATION –** Dam Safety Program – *Michael Anderson – NV Division of Water Resources*

H. **TRUCKEE RIVER LAWTON INTERCEPTOR FLOOD PROJECT PRESENTATION –** Overview of the Completed Project at Oxbow Park, Reno NV – *Glen Daily – City of Reno*

I. **NATIONAL FLOOD INSURANCE PROGRAM BASICS PRESENTATION –** Program Description and Eligibility - *Kim Groenewold, NV State Flood Plain Manager*

J. **U.S. ARMY CORPS OF ENGINEERS SILVER JACKETS PROGRAM –** Explanation of program and update of initial meeting – (The Silver Jackets program provides a formal and consistent strategy for an interagency approach to planning and implementing measures to reduce the risks associated with flooding and other natural hazards.) - *Kim Groenewold*

K. **2011 UNIFIED HAZARD MITIGATION GRANT CYCLE INFORMATION –** Grant Program Criteria and Deadlines - *Elizabeth Ashby , NV State Hazard Mitigation Officer*

L. **UPDATE TO COMMITTEE OF 2013 VERSION OF STATE HAZARD MITIGATION PLAN AND SUBMISSION TO FEMA -** *Chairman, Jim Walker*

M. **DISCUSS OPEN POSITION ON COMMITTEE (PRESS CLEWE RESIGNED) –** *Chairman, Jon Price*

N. **REPORT ON THE STATUS OF OPEN PRE-DISASTER MITIGATION AND HAZARD MITIGATION GRANT PROGRAM ALLOCATED NEVADA GRANTS –** Progress Report - *Karen Johnson, DEM*

O. **PUBLIC COMMENTS**

P. **ADJOURN**

*HAZUS-MH is a powerful risk assessment methodology for analyzing potential losses from floods, hurricane winds and earthquakes. In HAZUS-MH, current scientific and engineering knowledge is coupled with the latest geographic information systems (GIS) technology to produce estimates of hazard-related damage before, or after, a disaster occurs.

FUTURE MEETINGS: April 26, 2011 - (Elko) Host TBD Travel on the 25th and return on the 27th.
August 23. 2011 (Henderson) host City of Henderson, depend on project proposals
August 25, 2011 (Virginia City) host Storey County
November 10, 2011 (Las Vegas) host Clark County Flood Control

This is a public meeting. In conformance with the Nevada Public Meeting law, I Elizabeth Ashby, posted or caused the posting of this agenda on or before February 7, 2011, 9:00 a.m. at the following locations:

Nevada Division of Emergency Management (Carson City); Nevada Bureau of Mines and Geology (Reno);
Clark County Government Center (Las Vegas); Clark County Department of Development Services (Las Vegas)

And on the website for the Nevada Hazard Mitigation Planning Committee (http//www.nbmg.unr.edu/nhmpc/htm) and www.dem.state.nv.us
For further information please contact Jonathan G. Price, State Geologist and Director, Nevada Bureau of Mines and Geology by email at jprice@unr.edu or telephone (775) 784-6691 extension 5
We are pleased to make reasonable accommodations for members of the public who are disabled. If special arrangements are necessary, please notify the Committee at (775) 687-0314. Twenty-four hours advance notice is requested.

Minutes of the
Nevada Hazard Mitigation Planning Committee
10 February 2011

The Nevada Hazard Mitigation Planning Committee (NHMPC) met from 9:30 a.m. until 3:03 p.m. on Thursday, February 10, 2011 at the Lyon County Administrative Building, 27 South Main Street, Yerington, Nevada. These minutes and related documents are posted on the Web site for the committee (http://www.nbmg.unr.edu/nhmpc/nhmpc.htm).

Attendees included:
Michael Anderson, Division of Water Resources
Elizabeth Ashby, Nevada Division of Emergency Management (DEM)
Mike Cyphers*, Henderson Emergency Management
Glen Daily, City of Reno, Public Works
Kim Davis*, Division of Water Resources
Rick Diebold*, City of Las Vegas, Office of Emergency Management
Mike Dondero*, NV Division of Forestry
Gary Dunn*, Carson City of Emergency Management
Dick Faber, Lyon County Engineering
Robert Fellows*, Carson City Public Works
Gary Fried, Lyon County
Terri Garside, Nevada Bureau of Mines and Geology
Stephanie Hicks, RO Anderson Engineering
Karen Johnson, Division of Emergency Management
Rob Loveberg, Lyon County
Ron Lynn*, Department of Development Services, Clark County Building Department
Jeff Page, Lyon County
Jonathan Price*, Nevada Bureau of Mines and Geology
Jim Reagan*, NV Energy
Derek Starkey, City of Fernley Public Works
Andrew Trelease*, Clark County Regional Flood Control District
Jim Walker*, Nevada Department of Transportation
Mike Workman, Lyon County Utilities
Jim Youngblood, Lyon County Utilities

* indicates a member of the Board of Directors.

Members of the Board of Directors of the Committee who were unable to attend include:
Joe Curtis*, Storey County Emergency Management

Welcome and Introductions

Jon Price chaired the meeting. Attendees introduced themselves. A quorum (a majority of the 13 members of the Board of Directors) was present. Jon explained that the NHMPC meeting was being held in Yerington to allow the Committee members to meet the local officials and to receive insight into the County's hazards.

Approval of Minutes from November 18, 2010

The minutes of the 18 November 2010 were unanimously approved, with one correction. The corrected minutes will be posted on the NHMPC Web site at www.nbmg.unr.edu/nhmpc/nhmpc.htm.

Lyon County Presentation

Rob Loveberg gave a presentation demographics, government, geography, and economy of Lyon County. The county has approximately 2,013 square miles. The county has a population of approximately 53,825. The largest two cities are Fernley, with a population of 18,929, and Yerington, with a population of 3,100. Seventy-five percent of the county is public lands. Most of the population lives north of the Carson River.

The county is governed by the Board of Commissioners and the County Manager. The county employs 350 and the median income of county residents approximately $48,000.

Lyon County is the third most economically stressed county in the United States with a population of at least 25,000. In December, the unemployment rate was 18.7%, but it was recently reported that it has increased to 19.2%.

The county has seven improved airports, the Union Pacific Railroad, and Interstate 80, highways 50, 50A, 95 A, 208, and 341.

Earthquake Hazards in Lyon County

Jon Price reported that earthquake faults occur throughout Nevada. The Nevada Bureau of Mines and Geology recently released the map *Quaternary Faults in Nevada* (NBMG Open-File Report 09-9, available at www.nbmg.unr.edu). The on-line version of the map is searchable, which allows for searching all known large and potentially active faults in the area of a specific address. The map is to be used for approximate fault locations and should not be used as a definitive location of faults. If planning to build in one of the zones shown on the map, it is wise to hire a geological consultant to precisely locate faults and determine their frequency of movement. By using the information icon, and clicking on a specific fault, the known information on the fault appears. There are also layers that show the aerial photography and topography.

Due to extension, Nevada is acquiring approximately 1.3 acres of land each year. Salt Lake City and Reno are moving apart about a centimeter a year.

Jon distributed Nevada Bureau of Mines and Geology's Open-File Report 09-8, *Estimated Losses from Earthquakes near Nevada Communities,* available at www.nbmg.unr.edu/dox/of098/Scenarios/OpenFileReport09-8.pdf. The report contains HAZUS runs for 38 communities in Nevada, essentially all towns with a population of at least 500. The report contains runs for magnitudes 5, 5.5, 6, 6.5, and 7 earthquakes. The runs were compiled using a fault on the Quaternary fault map that is closest to the center of the community. The fault depth is run at 10 km (the average depth of earthquakes in the Great Basin).

Jon reported that he was not able to find evidence of a magnitude 6.0 or greater earthquake occurring in Lyon County, but there have been several large earthquakes in areas adjacent to Lyon County, which were felt in Lyon County.

According to the U.S. Geological Survey, the probability of a magnitude 6.0 earthquake within the next 50 years occurring near Yerington is approximately 60%. The probability of an earthquake near Dayton is

between 70-75%. The total economic loss to Yerington for a magnitude 6 earthquake is estimated at $56 million. If the earthquake occurred near Dayton, the estimated loss is $340 million.

HAZUS is an excellent tool that city managers, emergency managers, and planners should use in hazard mitigation, planning, and emergency response and recovery exercises.

The consequences of earthquakes can be huge in Nevada, particularly if individuals are not prepared.

The best thing that can be done to prevent building damage and loss of life or injury is to be prepared to respond; mitigate structural risks, largely through having current building codes; and mitigate nonstructural risks.

Jon's PowerPoint presentation on "Earthquake Hazards in Lyon County" is available online at www.nbmg.unr.edu/Geohazards/Earthquakes/EarthquakeResources.html#Presentations.

Flood Hazard in Lyon County

Rob Loveberg reported that Lyon County has regular flooding problems. They have recorded history of floods occurring in 1876, 1906, and 1907. The Carson River and Walker River are the main sources of flooding. Although they do not have the Truckee River in Lyon County, the Truckee River Canal does pose a flooding hazard.

The Nevada State Hazard Mitigation Plan ranks the Walker River as the 3rd most vulnerable river for flooding, with approximately $83 million in potential losses, and the Carson River at 4th, with approximately $70 million in potential losses.

Alluvial-fan flooding is almost an annual event. They also experience potential flooding from debris flows, breaks and failures from irrigation ditches and canals, and dam failures from upstream structures in Mono County and Carson City.

The flood maps for the communities show that all the communities in the county have the potential for flooding from rivers, canals, or irrigation ditches.

Development encroaching into the floodplains has caused increased flood hazards because of the reduction of the floodplain area.

Substantial floods occurred on the Carson River in 1986, 1997, and 2006.

Flooding on the Walker River in 1997 destroyed a residence in Smith Valley, washed out State Route 208 in Wilson Canyon, and flooded a significant portion of Yerington.

The Fernley Flood of 2008 was caused by a canal breach. Five-hundred eighty-two homes were affected, 121 homes sustained minor to moderate damage, four homes sustained substantial damage, and 457 homes had no apparent damage. The flood was declared a Presidential Disaster.

Current flood-mitigation efforts in the county include:

- Preparation of a County Hazard Mitigation Plan
- Floodplain Management
- Lyon County Comprehensive Master Plan

  - Land use designations
  - Incentives
- Carson River Regional Floodplain Management Plan
- Carson Water Subconservancy District Physical Map Revision Project
- Ramsey Canyon Water Flood Control Study

2011 Unified Hazard Mitigation Grant Cycle Information

Elizabeth Ashby reported on FEMA's Unified Hazard Mitigation Assistance (UHMA) Program. Two programs available to Nevada communities are:

I. HMGP – Post Disaster Mitigation; available after a presidentially declared disaster.

II. PDMC – Pre-disaster Mitigation; nationally competitive grants for pre-disaster projects and planning activities. PDMC project grants require a Benefit-Cost Analysis and documentation that will support the application. Documentation is critical to a successful proposal.

Elizabeth distributed a leaflet on the *"Unified Hazard Mitigation Assistance Program in Nevada"* (see attached; deadlines are included in the flier). The next deadline is June 16, 2011 when the letter of intent for applying for submitting applications is due.

Any community that does not have a FEMA-approved Hazard Mitigation Plan by November, 2011, and submits a project application in the 2011 application period, will have the project application held until the Plan is approved.

Review of the National Hazard Mitigation Assistance Grant Application Process

Jon Price, Kim Davis, and John Pickett attended the National Hazard Mitigation Assistance Grant Review Panel in January 2011. Jon distributed a list of criteria, which he compiled from his experience while serving on the Panel.

Jon recommended that the NHMPC review future Nevada proposals based on the National Review Panel's process.

Kim Davis mentioned that she and Elizabeth Ashby are working on developing a training program for future applicants. It was recommended that others who participated in the national review process, attend one of the training classes so they can relay their experiences to applicants.

Communicating Dam Safety Issues and Concerns

Michael Anderson gave an overview on the Dam Safety Program. He stated that if someone uses water for any purpose other than in their home, a permit is required, regardless of its source. This requirement includes capturing water from rainfall.

The Bureau of Reclamation and Army Corps of Engineers are exempt from having to obtain permits. If the project is for a local operator or owner, permits are required before the project is turned over to the local operator. The Bureau of Reclamation and Army Corps of Engineers are required to provide copies of their plans for future review by the Dam Safety Program.

Laws pertaining to dams were enacted in 1951. At that time, anything 10 feet or more in height in embankment or impounding 10 feet or more of acre-feet of water storage, required a permit. Prior to 1951, there were no permit requirements, but water rights were required.

There are now approximately 700 dams in the State's inventory. There are about 200-250 dams currently in the state that are not permitted, but they are monitored.

Responsibilities of the Program include:

- Perform periodic safety inspections
- Set safe storage levels
- Order appropriate restricted levels
- Review plans and specifications
- Perform periodic constructions inspections
- Assist dam owners in investigations with the problems with their structures
- Advise dam owners on prudent remedial actions (how to best fix problems)

The threshold for gaining approval to plans and specifications was altered in 1993 because there were numerous small structures, especially in the urban environment where they were dealing with runoff from subdivisions. The new specifications increase to 20 feet or greater in height, or any structure impounding more than 20 acre-feet of potentially mobile material.

The State Engineer has the latitude to require a dam permit for a structure if it would be classified as high-hazard even though it may not meet the above requirement.

Some of the issues of dam safety in Nevada include:

- Types of dams
- Dam owners and financial needs
- urbanization
- emergency action plans
- transfer of federal projects to local sponsors
- ownership
- dam inspections
- security

Dam types include:

- vast majority are homogeneous earthen structures
- zoned earth fill
- rock fill
- roller compacted concrete
- reverse curvature reinforced concrete
- double curvature thin-shell concrete (Wild Horse Dam)

Of the 663 active dams in the state, 153 are mining-related; 67 of which are actual tailings facilities.

Dams, like people, don't improve with age.

Why do dams fail?

- Inferior design or construction

- Inferior materials
- Inferior foundation/abutments
- Uncontrolled seepage/leakage
- Natural events – floods, earthquakes, or landslides
- Mechanical equipment failure
- Deterioration/lack of maintenance
- Improper operation of equipment or dam

Dams have an average economic life of 50 years.

Dam hazard classifications, based on an evaluation of consequences of dam failure absent of flooding conditions:

- High – loss of human life is expected in the event of failure
- Significant – significant damage is expected, but no loss of human life
- Low – no significant damage

The benefits of a safe dam include:

- Extended life of the structure
- Avoid costly repairs
- Full use of available storage
- Prevent failure of the dam
- Peace of mind

Although not a requirement, the Nevada Division of Water Resources does regulate some dams on federal land.

Truckee River Lawton Interceptor Flood Project Presentation

Elizabeth Ashby reported that this project was selected as one of FEMA's showcase projects and will be presented at FEMA's hazard mitigation assistance summit in March.

Glen Daily highlighted the project. The project was deemed necessary after the 1997 Truckee River flood. The flood shifted the river as much as 80 feet to the north in the Oxbow Park area. In the 2006 flood, additional land was lost.

The goal of the project was to stabilize the river bank and protect infrastructure.

The project was funded by FEMA's Hazard Mitigation Grant Program and the Truckee River Fund.

The project came in about $150,000 over budget and FEMA approved DEM's request for the transfer of funds from the state's management expenses category to cover the additional costs.

U.S. Army Corps of Engineers' Silver Jackets Program

Kim Davis reported that there was a meeting with the U.S. Army Corp of Engineers on January 13, 2011. The Corps wants to establish a Silver Jackets Team in every state.

The primary goals of the Silver Jackets program are to:

- Facilitate strategic life-cycle flood risk reduction;
- Create or supplement a continuous mechanism to collaboratively solve state-prioritized issues and implement or recommend those solutions;
- Improve processes, identifying gaps and counteractive programs;
- Leverage resources and information, learn about programs and how to combine;
- Improve and increase flood risk communication and present a unified interagency message; and
- Establish close relationships to facilitate integrated post-disaster recovery solutions.

Kim distributed handouts on FEMA's Risk Map, US Army Corps of Engineers' Flood Plain Management Services Program, and the Silver Jackets Program. (See attached.)

Kim's understanding is that the funding for the Silver Jackets Program will be used to fund the expenses for the core group to meet.

Update on the 2013 Version of the State Hazard Mitigation Plan and Submission to FEMA

Jim Walker reported that the State Hazard Mitigation Plan was approved by FEMA as an enhanced plan. The enhanced plan will allow for up to 20% in additional funding for mitigation efforts after a Presidential declaration of disaster (instead of the current 15%).

The 2013 update will include climate change as a hazard to Nevada.

Current Vacancies on the NHMPC Board

Postponed to the April meeting.

Report on the Status of Grants

Karen distributed forms to be used for reporting hazard mitigation plans and reports that are not funded by FEMA.

Karen reported on the status of the following funded projects (see attached):

Hazard Mitigation Grant Program (HMGP)

- HMGP1540, Waterfall Fire funding - Pending FEMA closure
- HMGP 1583, S. Nevada Floods - Pending FEMA closure
- HMGP 1629, N. NV Flood – mostly completed
- HMGP 1738, Fernley Floods – Lyon Co. plan in process; Dant Wash improvement pending environmental review.

PDM (Pre-Disaster Mitigation) Grant Program

- PDM 04/05, HAZUS Date Base Update – Closed
- PDM 06, Elko Band Council Plan – Closed
- PDM 07, awards for plans for Storey, Esmeralda, and Washoe Counties and the Henderson Sewer Project;
- PDM 08, Sky Tavern Wildfire water storage tank, Clark County Mitigation Plan Update

- PDM 09, Funding requests from Douglas County Emergency Management are under - FEMA NEPA Review
- PDM 10, City of Reno received a Congressional earmark, Lincoln Co. Plan Update, Churchill/Mineral County Plan, White Pine County Plan, Nye County Plan Update are all funded and in process; Douglas Co. - 395 Culvert Project, TRFP - Demo Edison Way and Storey - 6 Mile Canyon are in the environmental review process.

Public Comments

No comments received.

Announcements of Future Meetings

Thursday, April 26, 2011, in Elko (this is a change of date and venue from the November minutes)
Tuesday, August 23, 2011, in Henderson (depending on proposal submissions)
Thursday, 25, 2011, in Virginia City (depending on proposal submissions)
Thursday, November 10, 2011, in southern Nevada

Review of Action Items

An agenda item for strategic planning for the NHMPC will be added to a future meeting.

Adjourn

The meeting adjourned at 3:03 p.m.

Respectfully submitted by Terri Garside February 17, 2011

Nevada Hazard Mitigation Planning Committee
c/o Nevada Bureau of Mines and Geology
University of Nevada, Reno/MS 178
Reno, NV 89557-0178

775-784-4415

Agenda
Nevada Hazard Mitigation Planning Committee
Tuesday, April 26 & Wednesday 27, 2011, at 8:30 am
Elko County Public Works, Nannini Administration Building Room 102, 540 Court Street, Elko, Nevada

The Committee may take action on items marked by an asterisk (*). Items may be taken out of order presented on the agenda at the discretion of the chairperson.

A. **CALL TO ORDER AND INTRODUCTIONS** – *Chairman, Jon Price* Confirm Quorum

B. **APPROVAL OF MEETING MINUTES FROM FEBUARY 10, 2011 MEETING*** – *Chairman, Jon Price*

C. **ELKO COUNTY PRESENTATION REGARDING THE DEMOGRAPHICS, GOVERNMENT, GEOGRAPHY, ECONOMIC AND SOCIAL PROFILE OF THE COUNTY**- *Presenter Rob Stokes, County and Emergency Manager, Elko County*

D. **EARTHQUAKE HAZARD IN ELKO COUNTY PRESENTATION –** Earthquake HAZUS-MH** Report - *Jon Price, NV State Geologist*

E. **FLOOD HAZARD in ELKO COUNTY PRESENTATION –** Areas of Concern and Maps – *Presenter Randy Brown, Flood Plain Manager Elko County*

F. **NATIONAL FLOOD INSURANCE PROGRAM BASICS PRESENTATION –** Program Description and Eligibility - *Kim Davis, NV State Flood Plain Manager*

G. **2011 UNIFIED HAZARD MITIGATION GRANT CYCLE INFORMATION –** Grant Program Criteria and Deadlines - *Elizabeth Ashby, NV State Hazard Mitigation Officer*

H. **DISCUSS OPEN POSITION ON COMMITTEE (PRESS CLEWE RESIGNED) –** *Chairman, Jon Price*

I. **REPORT ON THE STATUS OF OPEN PRE-DISASTER MITIGATION AND HAZARD MITIGATION GRANT PROGRAM ALLOCATED NEVADA GRANTS –** Progress Report - *Karen Johnson, DEM*

J. **MODIFICATION OF NHMPC RANKING CRITERIA FOR HAZARD MITIGATION ASSISTANCE APPLICATIONS** – *Elizabeth Ashby*

K. **DISCUSSION OF 5-YEAR STRATEGIC PLAN FOR NHMPC –** *Facilitator, Jill Tingey, Elko County Interim Extension Educator, UNR*

L. **PUBLIC COMMENTS**

M. **ADJOURN**

**HAZUS-MH is a powerful risk assessment methodology for analyzing potential losses from floods, hurricane winds and earthquakes. In HAZUS-MH, current scientific and engineering knowledge is coupled with the latest geographic information systems (GIS) technology to produce estimates of hazard-related damage before, or after, a disaster occurs.

FUTURE MEETINGS: August 23. 2011 (Henderson) host City of Henderson, TBD depends on project proposals
August 25, 2011 (Virginia City) host Storey County
November 10, 2011 (Las Vegas) host Clark County Flood Control

This is a public meeting. In conformance with the Nevada Public Meeting law, I Elizabeth Ashby, posted or caused the posting of this agenda on or before April 20, 2011, 9:00 a.m. at the following locations:

Nevada Division of Emergency Management (Carson City); Nevada Bureau of Mines and Geology (Reno); Clark County Government Center (Las Vegas); Clark County Department of Development Services (Las Vegas)

And on the website for the Nevada Hazard Mitigation Planning Committee (http//www.nbmg.unr.edu/nhmpc/htm) and www.dem.state.nv.us For further information please contact Jonathan G. Price, State Geologist and Director, Nevada Bureau of Mines and Geology by email at jprice@unr.edu or telephone (775) 784-6691 extension 5

We are pleased to make reasonable accommodations for members of the public who are disabled. If special arrangements are necessary, please notify the Committee at (775) 687-0314. Twenty-four hours advance notice is requested.

Minutes of the
Nevada Hazard Mitigation Planning Committee
26 and 27 April 2011

The Nevada Hazard Mitigation Planning Committee (NHMPC) met from 8:33 a.m. until 5:00 p.m. on Tuesday, April 26 and 8:00 a.m. until 11:50 a.m. on Wednesday, April 27, 2011, in the Nannini Administration Building, 540 Court Street, Elko, Nevada. These minutes and related documents are posted on the Web site for the committee (http://www.nbmg.unr.edu/nhmpc/nhmpc.htm).

Attendees included:
Elizabeth Ashby, Nevada Division of Emergency Management (DEM)
Ed Atwell*, UNR Police Department
Matt Bernard, R.O. Anderson
Randy Brown, Flood Plain Manager, Elko County
Joe Curtis*, Storey County Emergency Management
Mike Cyphers*, Henderson Emergency Management
Kim Davis*, Division of Water Resources
Rick Diebold*, City of Las Vegas, Office of Emergency Management
Mike Dondero*, NV Division of Forestry
Jeremy Draper, City of Elko
Gary Dunn*, Carson City of Emergency Management
Robert Fellows*, Carson City Public Works
Lynn Forsberg, Elko County
Terri Garside, Nevada Bureau of Mines and Geology
Karen Johnson, Division of Emergency Management
Will Lehmann, Elko Police Department
Ron Lynn*, Department of Development Services, Clark County Building Department
Jonathan Price*, Nevada Bureau of Mines and Geology
Jim Reagan*, NV Energy
Robert Stokes, Elko City and County Manager
Jill Tingy, Elko County Cooperative Extension, UNR
Andrew Trelease*, Clark County Regional Flood Control District
Jim Walker*, Nevada Department of Transportation

* indicates a member of the Board of Directors.

Members of the Board of Directors of the Committee who were unable to attend:
None

Welcome and Introductions

Jon Price chaired the meeting. Attendees introduced themselves. A quorum (a majority of the 13 members of the Board of Directors) was present. Jon explained that the NHMPC meeting was being held in Elko to allow the Committee members to meet the local officials and to receive insight into the County's hazards.

Approval of Minutes from February 10, 2011

The minutes of the 10 February 2011 were unanimously approved. The minutes will be posted on the NHMPC Web site at www.nbmg.unr.edu/nhmpc/nhmpc.htm.

Elko County Presentation

Rob Stokes gave a presentation on the demographics, government, geography, and economy of Elko County.

Elko County is the fourth largest county in the continental U.S.. Its area is approximately 17 thousand square miles (11 million acres).

The incorporated cities are Elko, Carlin, Wells, and West Wendover. The population base is mainly located in Jackpot with 1,200 residents, Wells with 1,300 residents, Carlin with 2,400 residents, Elko with 18,000 residents, West Wendover with 4,400 residents, and the Spring Creek/Lamoille area with between 13,000-14,000 residents. The 2010 census data estimates the County's population at 49,000.

The economy is based on mining, ranching, outdoor recreation, and gaming.

The first university in Nevada was established in Elko in 1874 and was then moved to Reno in 1885.

Elko County provides library services for White Pine, Eureka, and Lander Counties.

Tax revenue is derived from consolidated (sales tax) taxes and property taxes.

The County's annual budget is $20.5 million. The Governor's budget proposes to cut 8% from fiscal year 2011-12, and 13% from fiscal years 2013-14. It also proposes to transfer the costs of Health and Social Services and all Risk Fire Services to the County.

The Governor's budget also proposes cutting the Wells Honor Camp, which will eliminate the inmate hotshot crews who respond to wildfires. If the Wells Honor Camp is eliminated, the closest Honor Camp will be based out of Carlin, NV and could take up to 1.5 hours to reach a fire in rural Elko County. The delay could cause a fire that would normally burn a few hundred acres to burn approximately 200,000 acres, depending on how quickly the crews arrive on scene.

Wildland fires burned approximately 900,000 acres in 2007 in Elko County.

The Elko fire district was established in 1956. There are currently 15 volunteer fire departments in the County. The Nevada Division of Forestry annually provides 12 paid positions to the County, with more provided during the summer months.

The ambulance service has been upgraded to an advanced life-support service. There is only one hospital in the County, and some clinics, but there are no urgent care facilities.

The Northeastern Nevada Regional Railport was recently constructed. It is a 60-acre multimodal transload facility and a 440-acre industrial park. A railport is similar to a seaport. The railport was constructed with the purpose of providing the County another source of revenue.

Seventy-six percent of the County is federally managed lands.

Earthquake Hazards in Elko County

Jon Price reported that earthquake faults occur throughout Nevada. The Nevada Bureau of Mines and Geology recently released the map *Quaternary Faults in Nevada* (NBMG Open-File Report 09-9, available at www.nbmg.unr.edu). The on-line version of the map is searchable, which allows for searching all known large and potentially active faults in the area of a specific address. The map is to be

used for approximate fault locations and should not be used as a definitive location of faults. If planning to build in one of the zones shown on the map, it is wise to hire a geological consultant to precisely locate faults and determine their frequency of movement. By using the information icon, and clicking on a specific fault, the known information on the fault appears. The faulds can be viewd on base maps showing aerial photographs or topography and roads.

Due to extension, Nevada is acquiring approximately 1.3 acres of land each year. Salt Lake City and Reno are moving apart about a centimeter a year.

Jon distributed Nevada Bureau of Mines and Geology's Open-File Report 09-8, *Estimated Losses from Earthquakes near Nevada Communities,* available at www.nbmg.unr.edu/dox/of098/Scenarios/OpenFileReport09-8.pdf. The report contains HAZUS runs for 38 communities in Nevada, essentially all towns with a population of at least 500. The report contains runs for magnitudes 5, 5.5, 6, 6.5, and 7 earthquakes. The runs were compiled using a fault on the Quaternary fault map that is closest to the center of the community. The fault depth is run at 10 km (the average depth of earthquakes in the Great Basin).

The largest recorded earthquake in Elko County was a 6.0 magnitude on February 21, 2008 in Wells. The most recent earthquake with a magnitude greater than 3.0 was a magnitude 3.7 on January 1, 2011 near West Wendover.

According to the U.S. Geological Survey, the probability of a magnitude 6.0 earthquake within the next 50 years occurring near (within 31 miles or 50 kilometers) Elko is approximately 10-15%. The total economic loss to Elko for a magnitude 6 earthquake is estimated at $160 million.

HAZUS is an excellent tool that city and county managers, emergency managers, and planners should use in hazard mitigation, planning, and emergency response and recovery exercises.

The consequences of earthquakes can be huge in Nevada, particularly if individuals are not prepared.

The best thing that can be done to prevent building damage and loss of life or injury is to be prepared to respond; mitigate structural risks, largely through having current building codes; and mitigate nonstructural risks.

Jon's PowerPoint presentation on "Earthquake Hazards in Elko County" is available online at www.nbmg.unr.edu/Geohazards/Earthquakes/EarthquakeResources.html#Presentations.

Flood Hazard in Elko County

Randy Brown gave a presentation on Elko County's flood education program.

The most common kind of flood in Elko County is a riverine flood, usually in the spring.

The 1993 flood of the Owyhee River in Mountain City was caused by a bridge (the Bridge to Nowhere). The culverts under the bridge could not handle the spring runoff, causing the earth foundation of the bridge to collapse, resulting in the bridge blocking the drainage path, further causing upstream flooding.

The 1983 flood of the Humboldt River caused flooding from Wells to Palisade.

Elko County used 300,000 tons of fill to raise the railport by three feet to mitigate future flooding in the railport area (the area affected by the 1983 flood).

The communities of Jarbidge, Lamoille, Midas, Jackpot, Mountain City, and Wells are the main flood-prone areas in the County. Flooding on Lamoille Creek is almost an annual event.

Most of the damages from flooding in the County are to crops bridges and roads (due to erosion).

In January, 2011, the daytime temperatures rose into the 60s, causing an early snow melt. When the temperatures dropped below zero overnight, the result was ice-flow flooding on Lamoille Creek.

Jon Price recommended Elko County work with DEM to apply for flood-mitigation project funding through FEMA.

ACTION ITEM: Elizabeth Ashby and Karen Johnson will coordinate with Randy Brown in Elko County regarding applying for FEMA funds for flood-mitigation projects.

ACTION ITEM: Andrew Trelease will send Randy Brown in Elko County copies of Clark County's flood license plate educational program.

National Flood Insurance Program Description and Eligibility

Kim Davis discussed the general aspects of the National Flood Insurance Program (NFIP). The National Flood Insurance Program is a federal program designed to provide insurance to property owners. It is available only in NFIP-participating communities. Currently in Nevada, only Esmeralda County and Lovelock do not participate in the NFIP.

Flood insurance rates vary by flood zones delineated on Flood Insurance Rate Maps. Insurance is mandatory for all federally-backed loans in high-risk flood hazard zones. Flood insurance covers all losses and is not a loan. It covers damage to two or more adjacent properties from any flooding source, provided one of the properties is insured.

The following grant programs are available:

- FMA (Flood Mitigation Assistance), Repetitive Flood Claims (RFC), and Severe Repetitive Loss (SRL) grants are designed to reduce claims against NFIP; must address NFIP insured properties; and mitigated properties must maintain flood insurance in perpetuity.

- Pre-Disaster Mitigation (PDM) and Hazard Mitigation Grant Program (HMGP) grants - Jurisdiction must participate in NFIP if project is located in a high-hazard flood zone

Mitigated properties must maintain flood insurance. The community must participate in the NFIP in order to qualify for the grant programs.

Common causes or types of flooding in Nevada include riverine, alluvial fan, canal brakes, flash, and flooding after a fire.

The water storage facilities are for agriculture use and not for flood water storage.

Flooding in Nevada causes a lot of damage to property and infrastructure and occasionally some loss of life.

FEMA is in the process of updating the flood maps. They have not updated the maps for Elko County yet. The most recent copies available are from 1986.

There have been thirteen Nevada State disaster declarations since 2002.

The annual average flood insurance premium for Elko County is about $900. There are a total of 107 policies issued County wide, with total coverage at $17,608,700, and with a total of 12 claims made since 1978.

NFIP will only insure structures with four walls and a roof.

2011 Unified Hazard Mitigation Grant Cycle Information

Elizabeth Ashby reported on FEMA's Unified Hazard Mitigation Assistance (UHMA) Program. Two programs available to Nevada communities are:

I. HMGP – Post Disaster Mitigation; available after a presidentially declared disaster.

II. PDMC – Pre-disaster Mitigation; nationally competitive grants for pre-disaster projects and planning activities. PDMC project grants require a Benefit-Cost Analysis and documentation that will support the application. Documentation is critical to a successful proposal. The cap on each proposal is $3 million.

Elizabeth distributed a leaflet on the *"Unified Hazard Mitigation Assistance Program in Nevada"* (see attached; deadlines are included in the flier). The next deadline is June 16, 2011 when the letter of intent to submit applications is due.

Any community that does not have a FEMA-approved Hazard Mitigation Plan by November, 2011, and submits a project application in the 2011 application period, will have the project application held until the Plan is approved.

DEM and the Army Corps of Engineers will be holding a workshop on applying for hazard mitigation grants in Elko on June 9, 2011. Contact Elizabeth Ashby at eashby@dps.state.nv.us for further information.

Elizabeth reported that the State Hazard Mitigation Plan was approved by FEMA as an enhanced plan. The enhanced plan will allow for up to 20% in additional funding for mitigation efforts after a Presidential declaration of disaster (instead of the current 15%). The application period for the additional 20% of funding is twelve months after the disaster event.

Jon Price recommended that the counties have mitigation project proposals prepared in advance for submission when Nevada receives post-disaster declaration funds. Having project proposals prepared in advance will speed up the application process.

Jon Price asked if there were any communities in Elko County at risk from canal or irrigation ditch breaches. Randy Brown replied that there were a few but not very many. The County has been very active in preventing new housing developments in flood-prone areas.

Current Vacancies on the NHMPC Board

Jonathan Price welcomed new Board member Ed Atwell, Emergency Manager, UNR Police Department. Ed replaces Press Clewe in the position of Washoe County Emergency Management.

Report on the Status of Grants

Karen Johnson reported on the status of the following funded projects (see attached):

Hazard Mitigation Grant Program (HMGP)

- HMGP1540, Waterfall Fire funding - Pending FEMA closure
- HMGP 1583, S. Nevada Floods - Pending FEMA closure
- HMGP 1629, N. NV Flood – mostly completed
- HMGP 1738, Fernley Floods – Lyon Co. plan in process; Dant Wash improvement pending environmental review.

PDM (Pre-Disaster Mitigation) Grant Program

- PDM 04/05, HAZUS Date Base Update – Closed
- PDM 06, Elko Band Council Plan – Closed
- PDM 07, awards for plans for Storey, Esmeralda, and Washoe Counties and the Henderson Sewer Project;
- PDM 08, Sky Tavern Wildfire water storage tank, Clark County Mitigation Plan Update
- PDM 09, Funding requests from Douglas County Emergency Management are under FEMA NEPA Review
- PDM 10, City of Reno received a Congressional earmark, Lincoln Co. Plan Update, Churchill/Mineral County Plan, White Pine County Plan, Nye County Plan Update are all funded and in process; Douglas Co. - 395 Culvert Project, TRFP - Demo Edison Way and Storey - 6 Mile Canyon are in the environmental review process.
- Special Projects, My Plan Nevada, project started
- PDM 2011, Elko County HMP Update, City of Caliente Flood, Pershing/Lander/Humboldt HMP, Douglas County HMP Update, Douglas St. Route 88 Culvert Project, NV State Parks Ft. Churchill, UNR Seismological Laboratory – all selected for further review
- FMA 2011, Washoe County Marlin Channel Detention – selected for further review

Public Comments

No comments received.

Five-Year Strategic Plan for NHMPC

Jill Tingey served as facilitator of a discussion on strategic planning. The committee discussed the future path of the NHMPC and how to maintain continuity in the committee. A major concern is replacing retiring members with people who can commit the level of participation to the committee that current members do.

Strategic planning is used to keep the organization on track.

Tools = education, planning, grants

Vision: Help safeguard citizens of Nevada

Mission: To provide the tools and processes for all of Nevada jurisdictions to identify and mitigate risks and hazards.

Below are items that were mentioned during brainstorming discussions and a few action items resulting from the discussions.

Overall Strategic Issues

I. Funding Vulnerability
- How can we increase the funding stream?
  - Without funding, we can't mitigate risks or plan

- Participation
- Alternate funding sources
  - Private sector
  - Other federal agencies

- How do we remain competitive?
- Funding needs:
  - Communities
  - Committees

- Unreinforced Masonry Builds (URMs)
  - People don't know how to mitigate
  - Historic issues
  - People will die
  - Expense of retrofitting

II. Education and Outreach

- Promotion
- Create internal fact sheet
  - What the committee has done and how it has been successful
- Public needs to understand the importance of the risks
- Document best practices
- Public relations campaign
- Political situation; other agencies may not be funded to provide education outreach
- Provide accomplishments
- Personal Responsibility

III. Continuation of Committee Effectiveness and Strengths

- Succession Planning
- Promote the committee's value to local stakeholders
- Orientation for new members
  - DC Review Process
  - Complicated process
- Culture of Committee
  - Participation
  - Expertise
  - Communication
  - Committed
  - Dedicated
  - Networking
  - Staff support
  - Leadership
  - Diversity of disciplines
  - Experience
  - Knowledge

IV. Political Climate

- Political support makes the committee a reality
- Enables participation for committee members
- Encourages mitigation projects submittals
- Reporting structure
  - Share successes/accomplishments with elected and appointed officials

- Legislation involvement/position on issues

Key Strategies for Achieving Goals

- *Funding*
  - Congressional delegation needs to know accomplishments
  - Funding sources for operations, associations, foundations
    - Compile a complete operating budget
  - Return on investment
  - Potential funding for projects (in addition to FEMA's regular grant process)
    - Congressional support
    - BLM and Forest Service support/responsibility
    - Sustainability monies
    - HUD
    - US Army Corps of Engineers
  - Barriers
    - Time
    - Lack of money/lack of local match
    - Competitive
    - Staff – local communities lack of expertise
    - Need to orchestrate communication with congressional delegations
  - Goals in the next six months
    - Compile fact sheet

- *Education and Outreach*
  - Web links
    - *Improve webpage (staff and NBMG)
    - Easier link or ability to find/new URL
    - Send Web opportunities to stakeholders
    - Establish and prioritize target audience
    - Presentations to communities
    - Flood, earthquake, fire – include funding opportunities
  - *Develop presentation on all hazards to general public – next six months
  - Produce a video
  - *Identify state agencies (NACO, Nevada League of Cities, etc) to reach in outreach activities (committee effort to promote mitigation and the successes of the committee)
  - *Create fact sheet/white paper
  - Target audience - who will have the greatest to lose
    - Resorts
    - Industry
    - Manufacturing
    - Insurance
    - Construction
    - Mining

  * Major initiatives

ACTION ITEM Elizabeth Ashby, Mike Cyphers, and Mike Dondero will provide information to Jon Price for development of an all-hazards presentation.

- *Continuation of Committee Effectiveness and Strengths*
  - Succession planning
    - Who will replace exiting members?
    - Change bylaws for more flexibility

- Orientation – develop one page paper (staff develops with committee contribution)
  - List of committee expectations
    - Exiting member alerts staff
    - Find replacement
    - Culture of committee
    - Characteristics to complement committee
  - Attend Proposal Review Panel in D.C.
- Fact sheet (staff developed)
  - Letter to supervisors
  - New initiatives sent out

Wednesday, April 26, 2011

- *Political Climate*
  - Fact sheet
  - Develop presentations – face-to-face interaction with a CD
    - No more than 30 minutes
    - Dynamic speaker
    - Need separate presentations that hit the highlights (10 minutes) for local officials
    - Use previous successful applicants as champions to share accomplishments
    - Off-session presentations to Legislators
    - Focus on local officials (city councils and county commissioners)
    - Inform Congressional delegation about the success of the mitigations dollars spent in Nevada (Chairs of NESC and NHMPC meet with DEM Chief)
    - Meet with the Chief of Staff of Legislators
    - Need DEM's approval
    - Become active in National Emergency Managements Association (NEMA)
    - Cross-fertilization – sharing successes with other states (SHMO annual meeting)
    - Presentations at IAEM (International Association of Emergency Managers) annual meeting (September 2011 in Las Vegas); take fact sheet

ACTION ITEM: Jon Price and Ron Lynn to meet with the Chief of DEM to request support of going to legislators in support of NHMPC and NESC.

- Need to get to know legislators/officials
- Legislative disaster awareness day
- NACO and League of Cities presentations
- Legislative champion

- Barriers
  - Time limitations during session
  - Term limits – learning curve steep
  - Lack of disasters

Mitigation Priorities – What should we focus on?

- URMs
- Critical infrastructure (utilities, power, water, gas, roads, telephones)
- Flood control projects; large and small; storm water drainage
- Mapping (updates, accuracy) – LiDar, H&H, modeling, restudies
- Irrigation canal and levees inventory
- Data collection – stream gages

- Buildings in danger of flooding (elevation projects)
- Historical flooding events (videos/photos); flood frequency analysis; for entire state
- Dam hazard issues
- Fire/flood correlation
- Vulnerability of Schools (committee select a demonstration project – submit proposal)
    - Non-structural hazards
    - Shelter in place
    - Built to code
- Wildland Fire
    - Fuels management
    - Post-mitigation fuels management
        - Sheep (Carson City)
    - Comprehensive state-wide public education programs
    - Urban wildland interface projects
    - Hardening infrastructure – e.g. underground utilities
- Mapping all hazards in detail – LiDar data acquisition
    - Landslides
    - Flood hazards (alluvial fans)
    - Faults
    - Liquefaction
    - Master plan land use and planning
    - Mapping of abandoned mines
    - Hazards disclosed to property buyers before close of sale

- Real time warning system for earthquakes
    - Seismometers
- Flood warning systems
- Roads and bridges
    - Drainage and flood issues
- ~~Terrorism~~
    - ~~Coordination of projects~~
    - ~~Seismic detection~~

  (Funding for terrorist acts is currently available to cover this item.)

Modification of NHMPC Ranking Criteria for Hazard Mitigation Assistance Applications

Elizabeth Ashby distributed examples of ranking criteria worksheets from FEMA, Nevada, Ohio, Iowa, Indiana, and Wisconsin. The committee reviewed the handouts and discussed ways to improve Nevada's ranking criteria.

ACTION ITEM: Elizabeth Ashby will research how FEMA assigns the 40 points to applications received for the EMPG program in relation to how NHMPC rates the proposals and report back to the committee.

A motion was made and passed to provide applicants with FEMA's ranking criteria when the letter of intent to apply is received.

After a detailed discussion on items 1 to 3 of Nevada's ranking criteria sheet. The following changes were recommended to item 3:

- Item A, use wording from FEMA's ranking criteria
- Item B to be deleted

- Items C and D, no changes
- Item E, add cost effectiveness
- Items F and G, no changes
- Item H, change to Resilience, Maintenance, and Sustainability Plan (with future clarification on each of those criteria for consistency in rating)

A motion was made and passed to accept the recommended changes to Nevada's ranking criteria sheet on items 1 to 3.

A motion was made and passed to renumber the Grant Prioritization Form a through h, deleting item b and adding item h as Resilience, Maintenance, and Sustainability Plan, but keeping the Assigned Values at 0-10.

A motion was made and passed to accept FEMA's ranking points from 1 to 1,000 divided by ten to end up with a point factor of 100.

The ranking criteria sheet will include a "yes" or "no" item asking if the application for a planning grant follows the format of the State plan so it is easily incorporated into the State plan.

Announcements of Future Meetings

Tuesday, August 23, 2011, in Henderson (depending on proposal submissions)
Thursday, August 25, 2011, in Virginia City
Thursday, November 10, 2011, in southern Nevada

Review of Action Items

Elizabeth Ashby and Karen Johnson will coordinate with Randy Brown in Elko County regarding applying for FEMA funds for flood-mitigation projects.

Andrew Trelease will send Randy Brown in Elko County copies of Clark County's flood license plate educational program.

Elizabeth Ashby, Mike Cyphers, and Mike Dondero will provide information to Jon Price for development of an all-hazards presentation.

Jon Price and Ron Lynn to meet with the Chief of DEM to request support of going to legislators in support of NHMPC and NESC.

Elizabeth Ashby will research how FEMA assigns the 40 points to applications received for the EMPG program in relation to how NHMPC rates the proposals and report back to the committee.

The Nevada ranking sheet will be revised to separate plans and projects so they will have separate evaluation criteria.

Public Comments

No comments received.

Adjourn

The meeting adjourned at 11:50 a.m. on April 26th.

Respectfully submitted by Terri Garside May 16, 2011

Nevada Hazard Mitigation Planning Committee
c/o Nevada Bureau of Mines and Geology
University of Nevada, Reno/MS 0178
Reno, NV 89557-0178

775-784-4415

Agenda
Nevada Hazard Mitigation Planning Committee
Thursday August 25, 2011, at 9:30 am
Storey County Emergency Operations Center, 141 North C Street, Virginia City, NV 89440

The committee may take action on items marked "For Possible Action." Items may be taken out of the order presented on the agenda at the discretion of the chairperson. Items may be combined for consideration by the Committee at the discretion of the chairperson. Items may be pulled or removed from the agenda at any time.

Q. **CALL TO ORDER AND INTRODUCTIONS** – *Chairman, Jon Price* Confirm Quorum

R. **PUBLIC COMMENTS -** Comments will not be restricted based on viewpoint.

S. **APPROVAL OF MEETING MINUTES FROM APRIL 26 & 27, 2011 MEETING (For Possible Action)** – *Chairman, Jon Price*

T. **DISCUSS VACANT POSITION ON COMMITTEE (MIKE CYPHERS RETIRED) –** *Chairman, Jon Price*

U. **STOREY COUNTY PRESENTATION REGARDING THE DEMOGRAPHICS, GOVERNMENT, GEOGRAPHY, ECONOMIC AND SOCIAL PROFILE OF THE COUNTY-** *Presenter Joe Curtis, Storey County Emergency Manager*

V. **EARTHQUAKE HAZARD IN STOREY COUNTY PRESENTATION –** Earthquake HAZUS-MH** Report - *Jon Price, NV State Geologist*

W. **FLOOD HAZARD in STOREY COUNTY PRESENTATION –** Areas of Concern and Maps – *Presenter Shawn Gardner, Flood Plain Manager Storey County*

X. **NATIONAL FLOOD INSURANCE PROGRAM BASICS PRESENTATION –** Program Description and Eligibility - *Kim Davis, NV State Flood Plain Manager*

Y. **2012 UNIFIED HAZARD MITIGATION GRANT CYCLE APPLICATION PRESENTATIONS AND COMMITTEE COMMENTS**

- **Clark County School District – *Dimitri Theodorou, Clark County School District***
  i. **Gas Valve Replacement for Schools**
  ii. **Las Vegas Academy Seismic Bracing**
- **Douglas County –**
  i. **Hazard Mitigation Plan Update – *Lisa Owen, East Fork Fire Department***
  ii. **State Route 88 Culvert Enhancement - *Stephanie Hicks, David Thompson, RO Anderson Engineering***
- **State Public Works Board – Caliente Youth Center – *Dan Daily, SPWB***
- **State Hazard Mitigation Plan Update Projects**

Z. **REPORT ON THE STATUS OF OPEN PRE-DISASTER MITIGATION AND HAZARD MITIGATION GRANT PROGRAM ALLOCATED NEVADA GRANTS –** Progress Report - *Karen Johnson, DEM*

AA. **UPDATE ON:**

- ***THE MODIFICATION OF NHMPC RANKING CRITERIA FOR HAZARD MITIGATION ASSISTANCE APPLICATIONS****; - Elizabeth Ashby*
- ***ACTION ITEMS FROM DISCUSSION OF 5-YEAR STRATEGIC PLAN FOR NHMPC –*** *Elizabeth Ashby*

BB. **PUBLIC COMMENTS -** Comments will not be restricted based on viewpoint.

CC. **ADJOURN -** (For Possible Action)

**HAZUS-MH is a risk assessment methodology for analyzing potential losses from floods, hurricane winds and earthquakes. In HAZUS-MH, current scientific and engineering knowledge is coupled with the latest geographic information systems (GIS) technology to produce estimates of hazard-related damage before, or after, a disaster occurs.

FUTURE MEETINGS: November 10, 2011 (Las Vegas) host Clark County Flood Control
February, 2012 (date to be determined)
May, 2012 (date to be determined)
August, 2012 (date to be determined)

This is a public meeting. In conformance with the Nevada Public Meeting law, I Elizabeth Ashby, posted or caused the posting of this agenda on or before August 22, 2011, 9:00 a.m. at the following locations:

Nevada Division of Emergency Management (Carson City); Nevada Bureau of Mines and Geology (Reno);
Clark County Government Center (Las Vegas); Clark County Department of Development Services (Las Vegas)
Storey County Emergency Management (Virginia City);

And on the website for the Nevada Hazard Mitigation Planning Committee (http//www.nbmg.unr.edu/nhmpc/htm) and www.dem.state.nv.us
For further information please contact Jonathan G. Price, State Geologist and Director, Nevada Bureau of Mines and Geology by email at jprice@unr.edu or telephone (775) 784-6691 extension 5
We are pleased to make reasonable accommodations for members of the public who are disabled. If special arrangements are necessary, please notify the Committee at (775) 687-0314. Twenty-four hours advance notice is requested.

Minutes of the
Nevada Hazard Mitigation Planning Committee
25 August 2011

The Nevada Hazard Mitigation Planning Committee (NHMPC) met from 9:30 a.m. until 3:34 p.m. on Thursday, August 25, 2011, in the Storey County Emergency Operations Center, 141 North C Street, Virginia City, Nevada. These minutes and related documents are posted on the Web site for the committee (http://www.nbmg.unr.edu/nhmpc/nhmpc.htm).

Attendees included:
Elizabeth Ashby, Nevada Division of Emergency Management (DEM)
Ed Atwell*, UNR Police Department
Toni Brags, East Fork Fire and Paramedic District / Douglas County
Tod Carlini, East Fork Fire and Paramedic District / Douglas County
Joe Curtis*, Storey County Emergency Management
Dan Daily, Public Works Division
Kim Davis*, Division of Water Resources
Craig dePolo, Nevada Bureau of Mines and Geology
Rick Diebold*, City of Las Vegas, Office of Emergency Management
Mike Dondero*, NV Division of Forestry
Gary Dunn*, Carson City of Emergency Management
Robert Fellows*, Carson City Public Works
Terri Garside, Nevada Bureau of Mines and Geology
Stephanie Hicks, RO Anderson Engineering
Karen Johnson, Division of Emergency Management
Kim Krumland, Clark County School District (via telephone)
Ron Lynn*, Department of Development Services, Clark County Building Department
Cherie Nevin, Storey County Emergency Management
P. Luke Opperman, Division of Water Resources
Lisa Owen, East Fork Fire and Paramedic District / Douglas County
Marilyn Parker, Clark County School District (via telephone)
Jonathan Price*, Nevada Bureau of Mines and Geology
Jim Reagan*, NV Energy
Tim Strucely, Clark County School District (via telephone)
Dimitri Theodorou, Clark County School District (via telephone)
Andrew Trelease*, Clark County Regional Flood Control District
David Thompson, RO Anderson
Jim Walker*, Nevada Department of Transportation

* indicates a member of the Board of Directors.

Members of the Board of Directors of the Committee who were unable to attend:
None

Welcome and Introductions

Jon Price chaired the meeting. Attendees introduced themselves. A quorum (a majority of the 13 members of the Board of Directors) was present. Jon explained that the NHMPC meeting was being held in Storey County to allow the Committee members to meet the local officials and to receive insight into the County's hazards.

Public Comments

No comments were received from the Public.

Approval of Minutes from April 26 and 27, 2011

The minutes of the April 26 and 27, 2011 meeting were unanimously approved. The minutes will be posted on the NHMPC Web site at www.nbmg.unr.edu/nhmpc/nhmpc.htm.

Current Vacancies on the NHMPC Board

Jonathan Price reported that the NHMPC position for Clark County Emergency Management is vacant. Jon also reported that he is retiring on June 30, 2012 and that Craig dePolo, Research Geologist with the Nevada Bureau of Mines and Geology, is his proposed replacement on the NHMPC Board.

Storey County Presentation

Joe Curtis gave a presentation on the demographics, government, geography, and economy of Storey County. Storey County is the second smallest county (Carson City being the smallest) in Nevada, at 262 square miles.

Storey County has experienced thirty wildland fires this year.

After the 2010 Census, Storey County has an estimated population of 4,010 (an 18% increase from the 2000 Census).

The main hazards for the County are earthquakes, fires (both wildland and community), flood, and wind. The main flood-prone areas in the county are from Vista to Wadsworth on the Truckee River and its tributaries.

Flash floods are a continued hazard in Virginia City. Carson Street is the usual path a flash flood takes through the City.

The owner of the San Francisco Hilton has been meeting with County officials regarding both underground and open-pit mining in Storey County. He recently purchased the Gold Hill Hotel and has started promoting it in the San Francisco area. Because of his efforts, the Gold Hill Hotel has seen a 46% occupancy increase in the last few months.

The County is home to the largest industrial park in the United States. The Tahoe-Reno Industrial Center (TRI) is a 104,000 acre industrial park located in the community of McCarran (east of Sparks). It is one of the most technologically and environmentally sophisticated industrial parks in the country.

The main housing areas in Storey County are Virginia City, The Highlands, Mark Twain Estates in Dayton Valley, Lockwood, and the TRI Complex.

The property tax rate is 3.4607%; sales tax is 7.60%; the per-capita income is $28,673.00; and the unemployment rate is 10.1.

In 1873, an inverted-siphon flume was built from Marlette Lake, down through Washoe Valley, then up to Virginia City. It travels from an elevation of 7,000 feet, down to about 4,000 feet, then back up 6,200 feet to Virginia City, without using a pump. That same water system is still in use today. Legislation guarantees that Virginia City receives first priority on the water from Marlette Lake.

The 1875 Virginia City fire destroyed most of the buildings in the City.

Electricity was brought to Virginia City in 1887, and the first telephone was installed in the 1880s.

Virginia City has an estimated 1.5 million visitors a year.

The Historic District has 300 buildings registered in the national historic register.

Earthquake Hazards in Storey County

Jon Price and Craig dePolo reported that earthquake faults occur throughout Nevada. The Nevada Bureau of Mines and Geology recently released the map *Quaternary Faults in Nevada* (NBMG Open-File Report 09-9, available at www.nbmg.unr.edu). The on-line version of the map is searchable, which allows for searching the large and potentially active faults in the area of a specific address. The map is to be used for approximate fault locations and should not be used as a definitive location of faults. If planning to build in one of the zones shown on the map, it is wise to hire a geological consultant to precisely locate faults and determine their frequency of movement. By using the information icon, and clicking on a specific fault, the known information on the fault appears. The faults can be viewed on base maps showing aerial photographs or topography and roads.

Due to extension, Nevada is acquiring approximately 1.3 acres of land each year. Salt Lake City and Reno are moving apart about a centimeter a year.

Jon distributed Nevada Bureau of Mines and Geology's Open-File Report 09-8, *Estimated Losses from Earthquakes near Nevada Communities*, available at www.nbmg.unr.edu/dox/of098/Scenarios/OpenFileReport09-8.pdf. The report contains HAZUS runs for 38 communities in Nevada, essentially all towns with a population of at least 500. The report contains runs for magnitudes 5, 5.5, 6, 6.5, and 7 earthquakes. The runs were compiled using a fault on the Quaternary fault map that is closest to the center of the community. The fault depth is run at 10 km (the average depth of earthquakes in the Great Basin).

Craig dePolo commented that the largest recorded earthquake in Storey County was a 6.7 magnitude on December 26, 1869; followed by a magnitude 6.1 eight hours later. The most recent earthquake with a magnitude greater than 5.0 near Virginia City was a magnitude 6.0 near Wabuska on June 25, 1933, which knocked down several chimneys and damaged the Catholic Church in Virginia City. The 1914 6.4 magnitude earthquake in Reno was felt strongly in Virginia City.

According to the U.S. Geological Survey, the probability of a magnitude 6.0 earthquake within the next 50 years occurring near (within 31 miles or 50 kilometers) Virginia City is approximately 70%. The total economic loss from a magnitude 6 earthquake near Virginia City is estimated at $490 million, $33 million of which would be in Storey County.

HAZUS is an excellent tool that city and county managers, emergency managers, and planners should use in hazard mitigation, planning, and emergency response and recovery exercises.

The consequences of earthquakes can be huge in Nevada, particularly if individuals are not prepared.

The best thing that can be done to prevent building damage and loss of life or injury is to be prepared to respond; mitigate structural risks, largely through having current building codes; and mitigate nonstructural risks.

Jon's PowerPoint presentation on "Earthquake Hazards in Storey County" is available online at http://www.nbmg.unr.edu/Geohazards/Earthquakes/Presentations/Earthquake_Hazards_in_Storey_County_12August2011.pdf.

National Flood Insurance Program Description and Eligibility

Kim Davis discussed the general aspects of the National Flood Insurance Program (NFIP). The National Flood Insurance Program is a federal program designed to provide insurance to property owners. It is available only in NFIP-participating communities. Currently in Nevada, only Esmeralda County and Lovelock do not participate in the NFIP.

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The water storage facilities are for agriculture use and not for flood water storage.

Flooding in Nevada causes a lot of damage to property and infrastructure and occasionally some loss of life.

FEMA is in the process of updating the flood maps. Storey County's maps have been updated.

There have been thirteen Nevada State disaster declarations since 2002.

The annual average flood insurance premium for Storey County is about $494. There are a total of 224 policies issued County wide, with total coverage at $42,388,300, and with a total of 7 claims made since 1978. Most of the claims paid in Storey County were from the Lockwood area.

NFIP will only insure structures with four walls and a roof.

A misconception is that if a property is not in a flood plain, the property owner cannot buy flood insurance. As long as a community participates in the NFIP, and is in good standing, anyone in that community can purchase flood insurance. This can be important for flash floods and canal breaches.

2012 Unified Hazard Mitigation Grant Cycle Presentations and Committee Comments

Tim Strucely and Kimberly Krumland gave presentations on two proposals submitted by Clark County.

Gas Valve Replacement for Schools
This proposal is for the installation of gas shutoff-valves at school sites and other district facilities by modifying existing gas lines entering each building to accept an in-line shutoff valve. The plan is to install valves in 357 schools and 100 administrative and facility buildings. The federal funds requested are $1,503,000, matching funds are $501,000, for a total project cost of $2,004,000.

Las Vegas Academy Seismic Bracing
The project proposes the installation of bracing in the Las Vegas Academy's gymnasium in order to strengthen it against damaging earthquakes and protect the lives of students and administrative staff using the facility during an earthquake. The federal funds requested are $633,283.50; matching funds are $211,094.50; for a total project cost of $844,378.

Tod Carlini, East Fork Fire and Paramedic District, and Stephanie Hicks and David Thompson, RO Anderson, gave presentations on two proposals submitted by Douglas County.

Douglas County Hazard Mitigation Plan Update
The proposed project is for a review and update of the current plan. The update will incorporate the establishment of a hazard mitigation team, and evaluation and revision of various sections of the plan, including a revised planning process, updated regional profile, capability assessment, hazard identification and risk assessment vulnerability assessment, and the plan maintenance section. Also included will be man-made hazards. The plan should take 22 months to complete. The estimated federal funds requested are $102,306.75; estimated matching funds are $34,102; for an estimated total project cost of $136,409.

State Route 88 Culvert Enhancement
The project proposes to construct five concrete culverts beneath State Route 88. The project will reduce damages to roadway infrastructure, decrease costs and repair time, and reduce community impacts due to roadway closures resulting from flood damage to the State Route 88 Bridge at the East Fork of the Carson River. It will also minimize or eliminate the risk of flooding for approximately 204 residents, existing facilities (including the County's emergency Command Center), library, swimming pool, and several commercial buildings. The federal funds requested are $1,557,000; matching funds are $520,000; for a total project cost of $2,077,000.

Culvert Replacement in Youth Center Drive
Dan Daily, Public Works Division, and David Thompson, RO Anderson, presented the proposal to replace the existing two concrete culverts in Youth Center Drive with a 90-foot spanning structure (bridge) that will increase the conveyance and capacity and reduce the risk of damage to the road and critical infrastructure (electrical substation, water and sewer lines) from local flooding. Youth Center Drive is the only access into and out of the Caliente Youth Center. The federal funds requested are $1,860,348.75; matching funds are $620,116.25; for a total project cost of $2,480,465.

ACTION ITEM: Elizabeth Ashby will arrange for internet access at the November meeting so project and plan applications can be reviewed on line by Committee members.

Elizabeth Ashby reported on the State Hazard Mitigation Plan Update projects. Five projects are being proposed A) Unreinforced Masonry Building Inventory integration into HAZUS; B) Irrigation Ditches; C) NHMPC Meeting Costs; D) State Hazard Plan Update; and E) HAZUS Training Workshops. The total funding available is $400,000 and the outcome will be the State Hazard Mitigation Update due in 2013.

The application will be competitive (meaning it will compete against all other plan and project applications received in Nevada) and will need to be ranked by the Committee during the review process.

It was recommended that the five projects be submitted as two proposals:

I.
- A. URM database integrated into HAZUS
- B. HAZUS Training
- C. Irrigation Ditches

II.
- A. NHMPC Meeting Costs
- B. Planning Subcommittee Costs

DEM is awaiting FEMA's recommendation on whether FEMA supports multiple applications versus submitting all five proposals as one.

Report on the Status of Grants

Karen Johnson reported on the status of the following funded projects (see attached):

Hazard Mitigation Grant Program (HMGP)
- HMGP1540, Waterfall Fire funding - Closed
- HMGP 1583, S. Nevada 2005 Floods - Closed
- HMGP 1629, N. NV Flood – mostly completed
- HMGP 1738, Fernley Floods – Lyon Co. plan in process; Dant Wash improvement Phase I Engineering should be completed in September.

PDM (Pre-Disaster Mitigation) Grant Program
- PDM 04/05, HAZUS Date Base Update – Closed
- PDM 06, Elko Band Council Plan – Closed
- PDM 07, awards for plans for Storey, Esmeralda, and Washoe Counties and the Henderson Sewer Project;
- PDM 08, Sky Tavern Wildfire water storage tank, Clark County Mitigation Plan Update – funding awarded
- PDM 09, Funding requests from Douglas County Emergency Management are under FEMA NEPA Review
- PDM 10, City of Reno received a Congressional earmark, Lincoln Co. Plan Update, Churchill/Mineral County Plan, White Pine County Plan, Nye County Plan Update are all funded and in process; Douglas Co. - 395 Culvert Project, TRFP - Demo Edison Way and Storey - 6 Mile Canyon are pending FEMA funding.
- Special Projects, My Plan Nevada, project started
- PDM 2011, Elko County HMP Update, Douglas County HMP Update, Douglas St. Route 88 Culvert Project, UNR Seismological Laboratory – all deselected due to no FEMA funding available, will resubmit in 2012
  City of Caliente Flood, Pershing/Lander/Humboldt HMP, NV State Parks Ft. Churchill – selected for further review.
- FMA 2011, Washoe County Marlin Channel Detention – selected for further review

Modification of NHMPC Ranking Criteria for Hazard Mitigation Assistance Applications

Item tabled until next meeting.

Action Items from 5-Year Strategic Planning Meeting Held in April 2011

Item tabled until next meeting

Public Comments

Kim Davis recommended that Stu Townsley be invited to the next meeting to provide an update on the Silver Jackets Program.

ACTION ITEM: Elizabeth Ashby will invite Stu Townsley to a future meeting to discuss the Silver Jackets Program.

Announcements of Future Meetings

Thursday, November 10, 2011
Tuesday, February 7, 2012
Tuesday, May 8, 2012
Thursday, August 9, 2012
Thursday, November 15, 2012

Review of Action Items

Elizabeth Ashby will arrange for internet access at the November meeting so projects and plans applications can be reviewed on line.

Elizabeth Ashby will invite Stu Townsley to a future meeting to discuss the Silver Jackets Program.

Adjourn

The meeting adjourned at 3:34 p.m. on August 25, 2011.

Respectfully submitted by Terri Garside 15 September, 2011

Nevada Hazard Mitigation Planning Committee
c/o Nevada Bureau of Mines and Geology
University of Nevada, Reno/MS 0178
Reno, NV 89557-0178

775-784-4415

Agenda
Nevada Hazard Mitigation Planning Committee
Thursday November 10, 2011, at 8:00 am
Clark County Regional Flood Control District, 600 S. Grand Central Parkway Room 108, Las Vegas

The committee may take action on items marked "For Possible Action." Items may be taken out of the order presented on the agenda at the discretion of the chairperson. Items may be combined for consideration by the Committee at the discretion of the chairperson. Items may be pulled or removed from the agenda at any time.

DD. **CALL TO ORDER AND INTRODUCTIONS** – *Chairman, Jon Price* Confirm Quorum

EE. **PUBLIC COMMENTS -** Comments will not be restricted based on viewpoint.

FF. **APPROVAL OF MEETING MINUTES FROM AUGUST 25, 2011 MEETING (For Possible Action)** – *Chairman, Jon Price*

GG. **2012 UNIFIED HAZARD MITIGATION GRANT CYCLE PRIORITAZATION BY NHMPC (For Possible Action) -**

- **Clark County School District –**
  i. **Gas Valve Replacement for Schools**
  ii. **Las Vegas Academy Seismic Bracing**
- **Douglas County –**
  i. **Hazard Mitigation Plan Update**
  ii. **State Route 88 Culvert Enhancement**
- **Elko County – Hazard Mitigation Plan Update**
- **State Public Works Board – Caliente Youth Center**
- **State Hazard Mitigation Plan Update Projects**

HH. **DISCUSS VACANT POSITION ON COMMITTEE (MIKE CYPHERS RETIRED) –** *Chairman, Jon Price*

II. **EARTHQUAKE HAZARD IN CLARK COUNTY PRESENTATION –** Earthquake HAZUS-MH** Report - *Jon Price, NV State Geologist*

JJ. **FLOOD HAZARD in CLARK COUNTY PRESENTATION –** Areas of Concern and Maps – *Presenter Gale Fraser, General Manager/Chief Engineer, Clark County Regional Flood Control District*

KK. **NATIONAL FLOOD INSURANCE PROGRAM BASICS PRESENTATION –** Program Description and Eligibility - *Kim Davis, NV State Flood Plain Manager*

LL. **REPORT ON THE STATUS OF OPEN PRE-DISASTER MITIGATION AND HAZARD MITIGATION GRANT PROGRAM ALLOCATED NEVADA GRANTS –** Progress Report - *Karen Johnson, Division of Emergency Management (DEM)*

MM. **PRESENTATION SPRING FLOODING IN UTAH –** Flood Report – Bob Carey, *Operations Chief, Utah DEM*

NN. **UPDATE ON:**

- ***ACTION ITEMS FROM DISCUSSION OF 5-YEAR STRATEGIC PLAN FOR NHMPC –*** *Elizabeth Ashby*

OO. **CLARK COUNTY PRESENTATION REGARDING THE DEMOGRAPHICS, GOVERNMENT, GEOGRAPHY, ECONOMIC AND SOCIAL PROFILE OF THE COUNTY-** *Presenter Irene Navis, Director, Clark County Emergency Management*

PP. **PUBLIC COMMENTS -** Comments will not be restricted based on viewpoint.

QQ. **ADJOURN -** (For Possible Action)

**HAZUS-MH is a risk assessment methodology for analyzing potential losses from floods, hurricane winds and earthquakes. In HAZUS-MH, current scientific and engineering knowledge is coupled with the latest geographic information systems (GIS) technology to produce estimates of hazard-related damage before, or after, a disaster occurs.

FUTURE MEETINGS: February 7, 2012 (Northern Nevada)
May 8, 2012 (Southern Nevada)
August 9, 2012 (Northern Nevada)
November 15, 2012 (Southern Nevada)

This is a public meeting. In conformance with the Nevada Public Meeting law, I Elizabeth Ashby, posted or caused the posting of this agenda on or before November 4, 2011, 9:00 a.m. at the following locations:

Nevada Division of Emergency Management (Carson City); Nevada Bureau of Mines and Geology (Reno);
Clark County Government Center (Las Vegas); Clark County Department of Development Services (Las Vegas)
Clark County Regional Flood Control District (Las Vegas);

And on the website for the Nevada Hazard Mitigation Planning Committee (http://www.nbmg.unr.edu/nhmpc/htm) and www.dem.state.nv.us
For further information please contact Jonathan G. Price, State Geologist and Director, Nevada Bureau of Mines and Geology by email at jprice@unr.edu or telephone (775) 784-6691 extension 5
We are pleased to make reasonable accommodations for members of the public who are disabled. If special arrangements are necessary, please notify the Committee at (775) 687-0314. Twenty-four hours advance notice is requested.

Minutes of the
Nevada Hazard Mitigation Planning Committee
10 November 2011

The Nevada Hazard Mitigation Planning Committee (NHMPC) met from 8:00 a.m. until 1:45 p.m. on Thursday, November 10, 2011 at the Clark County Regional Flood Control District, 600 S. Grand Central Parkway, Room 108, Las Vegas, Nevada. These minutes and related documents are posted on the Web site for the committee (http://www.nbmg.unr.edu/nhmpc/nhmpc.htm).

Attendees included:
Elizabeth Ashby, Nevada Division of Emergency Management (DEM)
Ed Atwell*, University of Nevada Police Department
Robert Carey, Operations Chief, Utah Division of Emergency Management
Shiela Curtis, Utah Division of Emergency Management
Kim Davis*, Division of Water Resources
Rick Diebold*, City of Las Vegas, Office of Emergency Management
Mike Dondero*, NV Division of Forestry
Gary Dunn*, Carson City of Emergency Management
Robert Fellows*, Carson City Public Works
Gale Fraser, Flood Plain Manager, Clark County
Terri Garside, Nevada Bureau of Mines and Geology, who held the proxy for Ron Lynn*, Department of Development Services, Clark County Building Department
Karen Johnson, Division of Emergency Management
Irene Navis, Director, Clark County Emergency Management
Jonathan Price*, Nevada Bureau of Mines and Geology
Ryan Turner, Henderson Emergency Management
Andrew Trelease*, Clark County Regional Flood Control District
Jim Walker*, Nevada Department of Transportation

* indicates a member of the Board of Directors.

Members of the Board of Directors of the Committee who were unable to attend include:
Joe Curtis*, Storey County Emergency Management
Jim Reagan*, NV Energy

WELCOME AND INTRODUCTIONS

Jon Price chaired the meeting. Attendees introduced themselves. A quorum (a majority of the 13 members of the Board of Directors) was present. Jon explained that the NHMPC meeting was being held in Clark County to allow the Committee members to meet the local officials and to receive insight into the County's hazards.

PUBLIC COMMENTS

No public comments were received.

APPROVAL OF MINUTES FROM AUGUST 25, 2011

The minutes of the August 25, 2011, meeting of the committee were unanimously approved. Minutes of the committee are posted on the NHMPC Web site at www.nbmg.unr.edu/nhmpc/nhmpc.htm.

Elizabeth Ashby gave an overview of the proposal prepared by the Division of Emergency Management for funding the update to the State's Hazard Mitigation Plan and the expenses for the NHMPC.

Karen Johnson and Elizabeth Ashby gave a brief overview of the other proposals received (detail follows).

2012 UNIFIED HAZARD MITIGATION GRANT PRIORITZATION

This cycle, the total federal funding available nationwide is $40 million.

Clark County School District Seismic Valves Replacement Project
This proposal is for the installation of gas shutoff-valves at school sites and other district facilities by modifying existing gas lines entering each building to accept an in-line shutoff valve. The plan is to install valves in 322 schools and school district facilities. The federal funds requested are $501,000, matching funds are $167,000, for a total project cost of $668,000.

Las Vegas Academy Seismic Bracing
The project proposes the installation of bracing in the Las Vegas Academy's gymnasium in order to strengthen it against damaging earthquakes and protect the lives of students and administrative staff using the facility during an earthquake. The federal funds requested are $633,283.50; matching funds are $211,094.50; for a total project cost of $844,378.

Douglas County Hazard Mitigation Plan Update
The proposed project is to review and update the current plan. The update will incorporate the establishment of a hazard mitigation team, and evaluation and revision of various sections of the plan, including a revised planning process, updated regional profile, capability assessment, hazard identification and risk assessment, vulnerability assessment, and plan-maintenance section. Also included will be man-made hazards. The plan should take 22 months to complete. The estimated federal funds requested are $102,258; estimated matching funds are $34,086; for an estimated total project cost of $136,344.

State Route 88 Culvert Enhancement
The project proposes to construct five concrete culverts beneath State Route 88. The project will reduce damages to roadway infrastructure, decrease costs and repair time, and reduce community impacts due to roadway closures resulting from flood damage to the State Route 88 Bridge at the East Fork of the Carson River. It will also minimize or eliminate the risk of flooding for approximately 204 residents, existing facilities (including the County's Emergency Command Center), library, swimming pool, and several commercial buildings. The federal funds requested are $1,557,000; matching funds are $520,000; for a total project cost of $2,077,000.

Caliente Youth Center Bridge Flood Mitigation
This proposed project is to replace the existing two concrete culverts in Youth Center Drive with a 90-foot spanning structure (bridge) that will increase the conveyance and capacity and reduce the risk of damage to the road and critical infrastructure (electrical substation, water and sewer lines) from local flooding. Youth Center Drive is the only access into and out of the Caliente Youth Center. The federal funds requested are $1,860,348.75; matching funds are $620,116.25; for a total project cost of $2,480,465.

State Hazard Mitigation Plan Update Projects
I.A. Irrigation Ditches

The Nevada Bureau of Mines and Geology (NBMG) will analyze suburban and urban areas that may be flooded by breaches of irrigation ditches and canals and present this information in GIS format in maps. The federal funds requested are $104,315.18; matching funds are $34,824.66; for a total project cost of $139,139.84.

I.B. Integration of URM data into HAZUS

Locations of potential unreinforced masonry buildings will be added into the HAZUS database for the state of Nevada and use HAZUS to calculate the reduction in risk that may be achievable for at least 20 major communities in Nevada. The federal funds requested are $63,205.80; matching funds are $21,068.60; for a total project cost of $84,274.40.

I.C. MyPlan Website

New GIS layers will be added to the MyPlan website to include flood data, earthquake hazards, and a new earthquake epicenter and geodetic strain map. The federal funds requested are $109,167.85; matching funds are $36,389.29; for a total project cost of $145,557.14.

I.D. Plan Update

The Nevada Bureau of Mines and Geology geologist Daphne LaPointe will work as directed by the Nevada Division of Emergency Management Hazard Mitigation Officer and the NHMPC Planning Subcommittee to review and revise the State Hazard Mitigation Plan. The federal funds requested are $63,000; matching funds are $21,000; for a total project cost of $84,000.

Total federal funds requested for all four projects are $339,688.83; matching funds are $113,282.55; for a total project cost of $452,971.38 for the State Hazard Mitigation Plan Update Projects.

Committee members ranked each of the six proposals submitted for new funding. Rankings were as follows:

First priority to State Hazard Mitigation Plan Update;
Second priority to Clark County School District for the valve replacement;
Third priority to Caliente Spring Heights Flood Project;
Fourth priority to Douglas County Hazard Mitigation Plan Update;
Fifth priority to Clark County School District for seismic retrofit of the Las Vegas Academy's gymnasium; and
Sixth priority to Douglas County for St. Route 88 culvert enlargement.

The Committee voted unanimously to approve the priorities as noted above for submission to FEMA by the Nevada Division of Emergency Management.

NHMPC VACANCY

Ryan Turner with Henderson Emergency Management has been nominated to fill the vacant Clark County Emergency Management position vacated in July by Mike Cyphers.

EARTHQUAKE HAZARDS IN CLARK COUNTY

Jon Price reported that earthquake faults occur throughout Nevada. The Nevada Bureau of Mines and Geology recently released the map *Quaternary Faults in Nevada* (NBMG Open-File Report 09-9, available at www.nbmg.unr.edu). The online version of the map is searchable, which allows for finding the large and potentially active faults in the area of a specific address. The map is to be used for approximate fault locations and should not be used as a definitive location of faults. If planning to build in

one of the zones shown on the map, it is wise to hire a geological consultant to precisely locate faults and determine their frequency of movement. By using the information icon, and clicking on a specific fault, the known information on the fault appears. The faults can be viewed on base maps showing aerial photographs or topography and roads.

Due to extension, Nevada is acquiring approximately 1.3 acres of area per year. Salt Lake City and Reno are moving apart about a centimeter a year.

Jon distributed Nevada Bureau of Mines and Geology's Open-File Report 09-8, *Estimated Losses from Earthquakes near Nevada Communities,* available at www.nbmg.unr.edu/dox/of098/Scenarios/OpenFileReport09-8.pdf. The report contains HAZUS runs for 38 communities in Nevada, essentially all towns with a population of at least 500. The report contains runs for magnitudes 5, 5.5, 6, 6.5, and 7 earthquakes. The runs were compiled using a fault on the Quaternary fault map that is closest to the center of the community. The fault depth is run at 10 km (the average depth of earthquakes in the Great Basin).

The last earthquake larger than a 3.0 in the Las Vegas area was a magnitude 3.6 on August 4, 2010. The earthquake was felt by some, but not many people.

The initial filling of Lake Mead caused minor earthquakes.

According to the U.S. Geological Survey, the probability of a magnitude 6.0 earthquake within the next 50 years occurring near (within 31 miles or 50 kilometers) Las Vegas is approximately 12%. The total economic loss from a magnitude 6 earthquake in Las Vegas is estimated at $7.2 billion.

HAZUS is an excellent tool that city and county managers, emergency managers, and planners should use in hazard mitigation, planning, and emergency response and recovery exercises.

The consequences of earthquakes can be huge in Nevada, particularly if individuals are not prepared.

The best thing that can be done to prevent building damage and loss of life or injury is to be prepared to respond; mitigate structural risks, largely through having current building codes; and mitigate nonstructural risks.

A recent compilation of un-reinforced masonry (URM) buildings, using the County Assessors' databases, estimates that Nevada could have as many as 23,600 URMs. Because a large number of the URMs are historic buildings, the issue is to how to retrofit them to make them safe.

Jon's PowerPoint presentation on "Earthquake Hazards in Clark County" is available online at http://www.nbmg.unr.edu/Geohazards/Earthquakes/Presentations/Earthquake_Hazards_in_Clark_County_10November2011.pdf.

CLARK COUNTY FLOOD HAZARD PRESENTATION

Gale Fraser welcomed NHMPC and gave a presentation on Clark County flood hazards. Las Vegas receives an average of 4.2 inches of rain per year. It is the driest urban area in the nation. The County is approximately 8,012 square miles and is the Nation's 15th largest county.

Census data show that Las Vegas had 47,000 residents in 1950 and 2,000,000 in 2010.
The Clark County Regional Flood Control District (CCRFD) was created in 1986. The Mission is to improve the protection of life and property for existing residents, future residents, and visitors from the

impacts of flooding while also protecting the environment. The Vision is to be the premier regional agency providing a community safe from devastation of floods while protecting the surface water environment.

Goal 1 is to provide master plans for the control of flooding.

Goal 2 is to implement projects that provide the community with flood protection.

The progress to date is:

- 85 detention basins
- 560 miles of channels and underground storm drains (240 miles of storm drain; 188 miles of improved channel; and 132 miles of natural channel)
- $1.6 billion in construction
- 51 square miles of flood zones removed

Remaining to be built:

- 36 detention basins
- 240 miles of channels and underground storm drains (146 miles of storm drain and 94 miles of improved channels)
-

Goal 3 is effective regulations, criteria and programs that protect the environment and are sound storm-water management tools.

Goal 4 is to enhance public awareness of flood safety and other district programs.

Goal 5 is to seek opportunities to maximize the efficiency and effectiveness of district services.

The CCRFD's annual budget is $305.1 million and is solely funded by a ¼ of 1% sales tax.

The Regional Flood Control District has its own television channel, The Flood Channel (Channel 4), where they televise Public Service Announcements regarding flood issues and safety.

The largest flood in Las Vegas' history was in 1999.

Jon Price presented Gale Fraser with a plaque in appreciation of his former service to the Nevada Hazard Mitigation Planning Committee.

NATIONAL FLOOD INSURANCE PROGRAM BASICS

Presentation was cancelled.

REPORT ON THE STATUS OF GRANTS

Karen Johnson reported on the status of the following funded projects:

Hazard Mitigation Grant Program (HMGP)

- HMGP1540, Waterfall Fire funding - Closed
- HMGP 1583, S. Nevada 2005 Floods - Closed
- HMGP 1629, N. NV Flood – mostly completed

- HMGP 1738, Fernley Floods – Lyon Co. plan consultant hired; Dant Wash improvement Phase I Engineering should be completed in soon; URM Inventory - on schedule; Ely Conservation seismic retrofit - application in process.

PDM (Pre-Disaster Mitigation) Grant Program

- PDM 07, awards for plans for Storey, Esmeralda, and Washoe Counties and the Henderson Sewer Project; all the plans are completed; the Henderson Sewer Project is in the construction phase.
- PDM 08, Sky Tavern Wildfire water storage tank, Clark County Mitigation Plan Update – funding awarded.
- PDM 09, Funding requests from Douglas County Emergency Management are under FEMA NEPA Review.
- PDM 10, City of Reno (Congressional earmark), Lincoln Co. Plan Update, Churchill/Mineral County Plan, and Nye County Plan Update are all funded and in process; White Pine County Plan awarded, no activity; Douglas Co. – US 395 Culvert Project, TRFP - Demo Edison Way and Storey - 6 Mile Canyon - awarded.
- Special Projects, My Plan Nevada, project started
- PDM 2011, Elko County HMP Update, Douglas County HMP Update, Douglas St. Route 88 Culvert Project, UNR Seismological Laboratory – funding pending.
  City of Caliente Flood, Pershing/Lander/Humboldt HMP, NV State Parks Ft. Churchill – selected for further review.
- FMA 2011, Washoe County Marlin Channel Detention – selected for further review.
- Nevada Special Projects, MyPlan Nevada and Portfolio Management – funded and project started.

SPRING FLOODING IN UTAH

Robert Carey, Operations Chief, Utah Division of Emergency Management gave a presentation on the 2011 spring flooding in Utah.

Utah is the second driest state, behind Nevada.

The snowpack in the spring of 2011 was between 150-200% of average.

The runoff from mid-March through July caused flooding in northern and central Utah. The southern area did not experience flooding because they had space in their storage basins, and their spring melting period is about a month behind northern and central Utah.

Logan River, Green River, Duchesne River, and Weber River reached 100 plus year flood-recurrence levels.

The Governor declared a State of Emergency for Utah on June 27, 2011. The President declared a major disaster for Utah on August 8, 2011.

The Utah National Guard used a helicopter to move 1,000 pound bags of sand to attempt to plug a breach in the Weber River levee.

Estimated damage costs are $12 million each for central and northern Utah.

ACTION ITEMS FROM DISCUSSION OF 5-YEAR STRATEGIC PLAN FOR NHMPC

Elizabeth Ashby led a discussion on the action items resulting from the strategic planning discussion at the April NHMPC meeting that was held in Elko. She is working on a public awareness campaign for promoting NHMPC's activities. A subcommittee will be established to review the NHMPC bylaws.

Jon Price gave an overview of the thirteen members who make up the NHMPC. He led a discussion on whether the Committee is missing some of the areas of expertise and whether changes should be made. There was general agreement that the current committee representation and size is appropriate.

It was recommended that term limits be set for Committee members. The Committee believes that a three-year, staggered term would be the best. There will also be a clause in the bylaws stating members who do not participate or do not attend three consecutive meetings could be removed from the Committee.

Jon Price announced that he will be retiring on June 30, 2012, which prompted a discussion as to how best to fill his position as Chair. The position on the Committee as a representative of the Nevada Bureau of Mines and Geology will be filled by Craig dePolo.

Terri Garside will also be leaving the Committee on June 30, 2012.

ACTION ITEM Elizabeth Ashby will place a discussion of the NHMPC bylaws on the next meeting's agenda.

CLARK COUNTY PRESENTATION ON THE DEMOGRAPHICS, GOVERNMENT, GEOGRAPHY, ECONOMIC, AND SOCIAL PROFILE OF CLARK COUNTY

Irene Navis reported that she has been with the Clark County Emergency Management since July, 2010.

The County is approximately 8,000 square miles; 90% of which is rural. It has approximately 2 million residents and 40 million visitors each year. Eighty-six percent of the land is federally managed. The County has 92% of the State's critical infrastructure.

The urban area is about 20 miles east to west, and 30 miles north to south.

There are five incorporated cities, eleven unincorporated towns, and three Indian tribes within the County's jurisdiction.

There are eighteen wilderness areas (700 square miles), two national wildlife refuges, and four national parks.

The County has 150,000 hotel rooms and between 250,000 – 300,000 visitors on any given day. Visitors come to the area for meetings, recreation, gaming, and tourism. Occupancy rates are between 85 – 90%.

Information on the County can be found at: www.monitoringprogram.com.

The area is still experiencing a 1% growth rate (down from 6%), even with the downturn in the economy.

County hazards are floods, fires, earthquakes, extreme heat, epidemics, avalanche/landslides, critical infrastructure failure, subsidence, hazmat events, and terrorist attacks.

Unemployment is at 13.6% for ages 18-25. There are an estimated 9,500 homeless, of which 1/3 are children.

PUBLIC COMMENTS

No public comments were received.

ANNOUNCEMENTS OF FUTURE MEETINGS

Tuesday, February 7, 2012 in northern Nevada
Tuesday, May 8, 2012 in Eureka, NV
Thursday, August 9, 2012 in Douglas County
Thursday, November 15, 2012 in Henderson, Nevada

REVIEW OF ACTION ITEMS

Action item remaining from August 25, 2011:
Elizabeth Ashby will invite Stu Townsley to a future meeting to discuss the Silver Jackets Program.

Action item from November 10, 2011:
Elizabeth Ashby will place a discussion of the NHMPC bylaws on the next meeting's agenda.

ADJOURN

The meeting adjourned at 1:45 p.m.

Respectfully submitted by Terri Garside December 9, 2011.

Nevada Hazard Mitigation Planning Committee
c/o Nevada Bureau of Mines and Geology
University of Nevada, Reno/MS 178
Reno, NV 89557-0178

775-784-4415

Agenda
Nevada Hazard Mitigation Planning Committee
Tuesday February 7, 2012, at 9:30 am
Carson City Fire Department, 777 S. Stewart Street, Carson City, NV 89701

The committee may take action on items marked "Discussion/For Possible Action." Items may be taken out of the order presented on the agenda at the discretion of the chairperson. Items may be combined for consideration by the Committee at the discretion of the chairperson. Items may be pulled or removed from the agenda at any time.

A. **CALL TO ORDER AND INTRODUCTIONS** – *Chairman, Jon Price* Confirm Quorum

B. PUBLIC COMMENT (Discussion only) – No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments are limited to 3 minutes unless the Committee elects to extend the comments for purposes of further discussion. Comments will not be restricted based on viewpoint.

C. **APPROVAL OF MEETING MINUTES FROM NOVEMBER 10, 2011 MEETING (Discussion /For Possible Action)** – *Chairman, Jon Price*

D. **CARSON CITY PRESENTATION REGARDING THE DEMOGRAPHICS, GOVERNMENT, GEOGRAPHY & FIRE HAZARD**- *Presenter Stacey Giomi – Carson City Fire Chief*

E. **ECONOMIC, SOCIAL PROFILE AND FUTURE DEVELOPMENT OF THE COUNTY**- *Presenter Lee Plemel – Carson City Planning Director*

F. **EARTHQUAKE HAZARD IN CARSON CITY PRESENTATION** – Earthquake HAZUS-MH** Report - *Jon Price, NV State Geologist*

G. **FLOOD HAZARD IN CARSON CITY PRESENTATION** – Areas of Concern and Maps – *Presenter Rob Fellows, Carson City Flood Plain Manager*

H. **PLANNING SUBCOMMITTEE REPORT**, *Chair Jim Walker*

- **Review of the current state hazard mitigation plan's goals and action items**

I. **PROPANE TANK SAFETY PRESENTATION** – *Eric Smith, Nevada Division of Water*

J. **FEMA's "LEVEE INCLUSIVE METHOD" AND WHAT THAT MEANS TO NEVADA** – *Rob Martinez, Nevada Division of Water*

K. **REPORT ON THE STATUS OF OPEN PRE-DISASTER MITIGATION AND HAZARD MITIGATION GRANT PROGRAM ALLOCATED NEVADA GRANTS** – Progress Report - *Karen Johnson, Division of Emergency Management (DEM)*

L. **UPDATE ON:** - *Elizabeth Ashby, Nevada Division of Emergency Management*

- ***ACTION ITEMS FROM DISCUSSION OF 5-YEAR STRATEGIC PLAN FOR NHMPC***
- ***PRIORITIZATION OF GRANT APPLICATIONS***
- ***ORIENTATION FOR NEW MEMBERS***
- ***NHMPC BY-LAW REVISIONS***

M. **ANNOUNCEMENT OF FUTURE MEETINGS:** *Chairman, Jon Price*
May 8, 2012 (Eureka);
August 9, 2012 (Douglas);
August 10, 2012 (Clark County - PENDING submission of southern Nevada applications);
November 15, 2012 (Henderson)

N. PUBLIC COMMENT (Discussion only) – No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments are limited to 3 minutes unless the Committee elects to extend the comments for purposes of further discussion. Comments will not be restricted based on viewpoint.

O. **ADJOURN** - (Discussion/For Possible Action)

This is a public meeting. In conformance with the Nevada Public Meeting law, I Elizabeth Ashby, posted or caused the posting of this agenda on or before February 2, 2012, 9:00 a.m. at the following locations:

Nevada Division of Emergency Management (Carson City); Nevada Bureau of Mines and Geology (Reno);
Clark County Government Center (Las Vegas); Clark County Department of Development Services (Las Vegas)
Carson City Fire Department, Station #1 (Carson City);

And on the website for the Nevada Hazard Mitigation Planning Committee (http://www.nbmg.unr.edu/nhmpc/htm) and www.dem.state.nv.us
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Minutes of the
Nevada Hazard Mitigation Planning Committee
7 February 2012

The Nevada Hazard Mitigation Planning Committee (NHMPC) met from 9:34 a.m. until 1:45 p.m. on Tuesday, February 7, 2012 at the Carson City Fire Department, 777 S. Stewart St., Carson City, Nevada. These minutes and related documents are posted on the Web site for the committee (http://www.nbmg.unr.edu/nhmpc/nhmpc.htm).

Attendees included:
Elizabeth Ashby, Nevada Division of Emergency Management (DEM)
Craig dePolo, Nevada Bureau of Mines and Geology
Rick Diebold*, City of Las Vegas, Office of Emergency Management
Mike Dondero*, NV Division of Forestry
Gary Dunn*, Carson City of Emergency Management
Robert Fellows*, Carson City Public Works
Terri Garside, Nevada Bureau of Mines and Geology
Stacey Giomi, Carson City Fire Chief
Juliette Hayes, FEMA, Region IX
Stephanie Hicks, RO Anderson
Daphne LaPointe, Nevada Bureau of Mines and Geology
Ron Lynn*, Department of Development Services, Clark County Building Department
Lee Plemel, Carson City Planning Director
Robert Martinez, Nevada Division of Water, who held the proxy for Kim Davis*, Division of Water Resources
Jonathan Price*, Nevada Bureau of Mines and Geology
Jim Reagan*, NV Energy
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Ryan Turner*, Henderson Emergency Management
Andrew Trelease*, Clark County Regional Flood Control District
Jim Walker*, Nevada Department of Transportation
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* indicates a member of the Board of Directors.

Members of the Board of Directors of the Committee who were unable to attend include:
Ed Atwell*, University of Nevada Police Department
Joe Curtis*, Storey County Emergency Management

WELCOME AND INTRODUCTIONS

Jon Price chaired the meeting. Attendees introduced themselves. A quorum (a majority of the 13 members of the Board of Directors) was present. Jon explained that the NHMPC meeting was being held in Carson City to allow the Committee members to meet the local officials and to receive insight into the City / County's hazards.

PUBLIC COMMENTS

No public comments were received.

APPROVAL OF MINUTES FROM NOVEMBER 10, 2011

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ECONOMIC AND SOCIAL PROFILE, AND FUTURE DEVELOPMENT OF CARSON CITY

Lee Plemel gave an overview of Carson City's demographics and growth. Carson City is a consolidated municipality, meaning that it is both a county and a city.

Carson City encompasses approximately 146,000 square miles; 15% of which is developable.

The 2010 census reported that Carson City has 55,274 residents.

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Juliette Hayes complimented the Subcommittee's efforts, and said that Nevada serves as an example to other states.

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- Special Projects, My Plan Nevada, project started
- PDM 2011, Elko County HMP Update, Douglas County HMP Update, Douglas St. Route 88 Culvert Project, UNR Seismological Laboratory – funding pending.
  City of Caliente Flood, Pershing/Lander/Humboldt HMP, NV State Parks Ft. Churchill – selected for further review.
- FMA 2011, Washoe County Marlin Channel Detention – selected for further review.
- Nevada Special Projects, MyPlan Nevada– funded and project started.

Funding for the awards for applications submitted the end of 2011 should be announced soon.

DIVISION OF EMERGENCY MANAGEMENT UPDATE

Elizabeth Ashby reported that future funding for the PDMG has been eliminated because Congress has not funded the program. There will continue to be funding for flood-mitigation projects and the HMGP program.

DEM is working with FEMA to secure future funding to continue the Plan updates and updates for Nevada communities.

Elizabeth would like to continue the hazard mitigation proposal process for projects up to $500,000 each, in case Nevada receives funding from Presidential disaster declarations. With projects ready to go, it will streamline the award process.

ACTION ITEM: Elizabeth Ashby will compile and distribute guidelines for the new grant application process.

The cut to the funding should not impact the NHMPC Committee because there will be funding coming from current PDMC projects.

Ron Lynn asked Juliette if there was a "Best Practices for Mitigation Projects."

Elizabeth reported on the current status of the action items from the discussion in Elko of the 5-year strategic plan for NHMPC.

DEM and others are progressing on the orientation for new members. One suggestion was to make a short video of current members, introducing the new members to NHMPC, and detailing what the Committee's mission and goals are.

Elizabeth has met with the Deputy Attorney General regarding the NHMPC bylaws and will distribute the DAG's comments to the Committee on the suggested bylaw revisions.

Elizabeth distributed a printout of a short presentation available for use to promote hazard mitigation planning. The presentation will be posted on the NHMPC website.

PUBLIC COMMENTS

No public comments were received.

ANNOUNCEMENTS OF FUTURE MEETINGS

Tuesday, May 8, 2012 in Eureka, NV (Board members will travel to Eureka Monday, May 7th)
Thursday, August 9, 2012 - Cancelled
Thursday, November 15, 2012 in Henderson, Nevada

REVIEW OF ACTION ITEMS

Action item remaining from August 25, 2011:
Elizabeth Ashby will invite Stu Townsley to a future meeting to discuss the Silver Jackets Program.

Action items from February 7, 2012:
Elizabeth Ashby will provide a worksheet to Committee members for keeping track of any completed mitigation activities done in the state. The mitigation activities will be included in the next Plan update.

Elizabeth Ashby will compile and distribute guidelines for the new grant application process.

ADJOURN

The meeting adjourned at 1:45 p.m.

Respectfully submitted by Terri Garside, April 2, 2012, 2012.

Nevada Hazard Mitigation Planning Committee
c/o Nevada Bureau of Mines and Geology
University of Nevada, Reno/MS 178
Reno, NV 89557-0178

775-784-4415

Agenda
Nevada Hazard Mitigation Planning Committee
Tuesday May 8, 2012, at 8:00 am
Opera House, 31 South Main Street, Eureka, NV

The committee may take action on items marked "Discussion/For Possible Action." Items may be taken out of the order presented on the agenda at the discretion of the chairperson. Items may be combined for consideration by the Committee at the discretion of the chairperson. Items may be pulled or removed from the agenda at any time.

RR. **CALL TO ORDER AND INTRODUCTIONS (Discussion Only)** – *Chairman, Jon Price* Confirm Quorum

SS. PUBLIC COMMENT (Discussion only) – No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments are limited to 3 minutes unless the Committee elects to extend the comments for purposes of further discussion. Comments will not be restricted based on viewpoint.

TT. **APPROVAL OF MEETING MINUTES FROM FEBRUARY 7, 2012 MEETING (Discussion /For Possible Action)** – *Chairman, Jon Price*

UU. **EUREKA & WHITE PINE COUNTY PRESENTATIONS REGARDING THE DEMOGRAPHICS, GOVERNMENT, ECONOMIC, SOCIAL PROFILE AND FUTURE DEVELOPMENT OF THE COUNTY- (Discussion Only)***Presenter Russ Peacock, EM, White Pine and Michael Sullivan, Asst. EM Eureka*

VV. **EARTHQUAKE HAZARD IN EUREKA & WHITE PINE COUNTIES PRESENTATION (Discussion Only) –** Earthquake HAZUS-MH** Report - *Jon Price, NV State Geologist*

WW. **FLOOD HAZARD IN WHITE PINE COUNTY PRESENTATION (Discussion Only)–** Areas of Concern and Maps – *Chris Flannery Flood Plain Manager*

XX. **PLANNING SUBCOMMITTEE REPORT (Discussion Only)** *Chair Jim Walker*

- **Review of the current state hazard mitigation plan's goals and action items**

YY. **TRIBAL DISCUSSION OF STATEWIDE PLANNING EFFORTS (Discussion Only) –** Brent Hunt, Duck Valley Tribe

ZZ. **REPORT ON THE STATUS OF OPEN PRE-DISASTER MITIGATION AND HAZARD MITIGATION GRANT PROGRAM ALLOCATED NEVADA GRANTS (Discussion Only)**– Progress Report - *Karen Johnson, Division of Emergency Management (DEM)*

AAA. **UPDATE ON: (Discussion /For Possible Action)-** *Elizabeth Ashby, Nevada Division of Emergency Management*

- ***ACTION ITEMS FROM DISCUSSION OF 5-YEAR STRATEGIC PLAN FOR NHMPC***
- ***PRIORITIZATION OF GRANT APPLICATIONS***
- ***ORIENTATION FOR NEW MEMBERS***
- ***NHMPC BY-LAW REVISIONS***

BBB. **ANNOUNCEMENT OF FUTURE MEETINGS (Discussion Only) :***Chairman, Jon Price*
August 9, 2012 (Douglas);
August 10, 2012 (Clark County - PENDING submission of southern Nevada applications);
November 15, 2012 (Henderson)

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DDD. **ADJOURN -** (Discussion/**For Possible Action**)

This is a public meeting. In conformance with the Nevada Public Meeting law, I Elizabeth Ashby, posted or caused the posting of this agenda on or before May2, 2012, 9:00 a.m. at the following locations:

Nevada Division of Emergency Management (Carson City); Nevada Bureau of Mines and Geology (Reno);

Clark County Government Center (Las Vegas); Clark County Department of Development Services (Las Vegas)
Eureka Public Works Building, (Eureka);
White Pine County Building (White Pine)

And on the website for the Nevada Hazard Mitigation Planning Committee (http://www.nbmg.unr.edu/nhmpc/htm) and www.dem.state.nv.us
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- PDM 2011, Elko County HMP Update, Douglas County HMP Update, Douglas St. Route 88 Culvert Project, UNR Seismological Laboratory – funding pending.
  City of Caliente Flood, Pershing/Lander/Humboldt HMP, NV State Parks Ft. Churchill – selected for further review.
- FMA 2011, Washoe County Marlin Channel Detention – selected for further review.
- Nevada Special Projects, MyPlan Nevada– funded and project started.

Funding for the awards for applications submitted the end of 2011 should be announced soon.

DIVISION OF EMERGENCY MANAGEMENT UPDATE

Elizabeth Ashby reported that future funding for the PDMG has been eliminated because Congress has not funded the program. There will continue to be funding for flood-mitigation projects and the HMGP program.

DEM is working with FEMA to secure future funding to continue the Plan updates and updates for Nevada communities.

Elizabeth would like to continue the hazard mitigation proposal process for projects up to $500,000 each, in case Nevada receives funding from Presidential disaster declarations. With projects ready to go, it will streamline the award process.

ACTION ITEM: Elizabeth Ashby will compile and distribute guidelines for the new grant application process.

The cut to the funding should not impact the NHMPC Committee because there will be funding coming from current PDMC projects.

Ron Lynn asked Juliette if there was a "Best Practices for Mitigation Projects."

Elizabeth reported on the current status of the action items from the discussion in Elko of the 5-year strategic plan for NHMPC.

DEM and others are progressing on the orientation for new members. One suggestion was to make a short video of current members, introducing the new members to NHMPC, and detailing what the Committee's mission and goals are.

Elizabeth has met with the Deputy Attorney General regarding the NHMPC bylaws and will distribute the DAG's comments to the Committee on the suggested bylaw revisions.

Elizabeth distributed a printout of a short presentation available for use to promote hazard mitigation planning. The presentation will be posted on the NHMPC website.

PUBLIC COMMENTS

No public comments were received.

ANNOUNCEMENTS OF FUTURE MEETINGS

Tuesday, May 8, 2012 in Eureka, NV (Board members will travel to Eureka Monday, May 7th)
Thursday, August 9, 2012 - Cancelled
Thursday, November 15, 2012 in Henderson, Nevada

REVIEW OF ACTION ITEMS

Action item remaining from August 25, 2011:
Elizabeth Ashby will invite Stu Townsley to a future meeting to discuss the Silver Jackets Program.

Action items from February 7, 2012:
Elizabeth Ashby will provide a worksheet to Committee members for keeping track of any completed mitigation activities done in the state. The mitigation activities will be included in the next Plan update.

Elizabeth Ashby will compile and distribute guidelines for the new grant application process.

ADJOURN

The meeting adjourned at 1:45 p.m.

Respectfully submitted by Terri Garside, April 2, 2012, 2012.

Nevada Hazard Mitigation Planning Committee
c/o Nevada Bureau of Mines and Geology
University of Nevada, Reno/MS 178
Reno, NV 89557-0178

775-784-4415

Agenda
Nevada Hazard Mitigation Planning Committee
Tuesday May 8, 2012, at 8:00 am
Opera House, 31 South Main Street, Eureka, NV

The committee may take action on items marked "Discussion/For Possible Action." Items may be taken out of the order presented on the agenda at the discretion of the chairperson. Items may be combined for consideration by the Committee at the discretion of the chairperson. Items may be pulled or removed from the agenda at any time.

EEE. **CALL TO ORDER AND INTRODUCTIONS (Discussion Only)** – *Chairman, Jon Price* Confirm Quorum

FFF. PUBLIC COMMENT (Discussion only) – No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments are limited to 3 minutes unless the Committee elects to extend the comments for purposes of further discussion. Comments will not be restricted based on viewpoint.

GGG. **APPROVAL OF MEETING MINUTES FROM FEBRUARY 7, 2012 MEETING (Discussion /For Possible Action)** – *Chairman, Jon Price*

HHH. **EUREKA & WHITE PINE COUNTY PRESENTATIONS REGARDING THE DEMOGRAPHICS, GOVERNMENT, ECONOMIC, SOCIAL PROFILE AND FUTURE DEVELOPMENT OF THE COUNTY- (Discussion Only)***Presenter Russ Peacock, EM, White Pine and Michael Sullivan, Asst. EM Eureka*

III. **EARTHQUAKE HAZARD IN EUREKA & WHITE PINE COUNTIES PRESENTATION (Discussion Only) –** Earthquake HAZUS-MH** Report - *Jon Price, NV State Geologist*

JJJ. **FLOOD HAZARD IN WHITE PINE COUNTY PRESENTATION (Discussion Only)–** Areas of Concern and Maps – *Chris Flannery Flood Plain Manager*

KKK. **PLANNING SUBCOMMITTEE REPORT (Discussion Only)** *Chair Jim Walker*

- **Review of the current state hazard mitigation plan's goals and action items**

LLL. **TRIBAL DISCUSSION OF STATEWIDE PLANNING EFFORTS (Discussion Only) –** Brent Hunt, Duck Valley Tribe

MMM. **REPORT ON THE STATUS OF OPEN PRE-DISASTER MITIGATION AND HAZARD MITIGATION GRANT PROGRAM ALLOCATED NEVADA GRANTS (Discussion Only)–** Progress Report - *Karen Johnson, Division of Emergency Management (DEM)*

NNN. **UPDATE ON: (Discussion /For Possible Action)-** *Elizabeth Ashby, Nevada Division of Emergency Management*

- ***ACTION ITEMS FROM DISCUSSION OF 5-YEAR STRATEGIC PLAN FOR NHMPC***
- ***PRIORITIZATION OF GRANT APPLICATIONS***
- ***ORIENTATION FOR NEW MEMBERS***
- ***NHMPC BY-LAW REVISIONS***

OOO. **ANNOUNCEMENT OF FUTURE MEETINGS (Discussion Only) :***Chairman, Jon Price*
August 9, 2012 (Douglas);
August 10, 2012 (Clark County - PENDING submission of southern Nevada applications);
November 15, 2012 (Henderson)

PPP. PUBLIC COMMENT (Discussion only) – No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action my be taken. Public comments are limited to 3 minutes unless the Committee elects to extend the comments for purposes of further discussion. Comments will not be restricted based on viewpoint.

QQQ. **ADJOURN -** (Discussion/**For Possible Action**)

This is a public meeting. In conformance with the Nevada Public Meeting law, I Elizabeth Ashby, posted or caused the posting of this agenda on or before May2, 2012, 9:00 a.m. at the following locations:

Nevada Division of Emergency Management (Carson City); Nevada Bureau of Mines and Geology (Reno);
Clark County Government Center (Las Vegas); Clark County Department of Development Services (Las Vegas)
Eureka Public Works Building, (Eureka);
White Pine County Building (White Pine)

And on the website for the Nevada Hazard Mitigation Planning Committee (http://www.nbmg.unr.edu/nhmpc/htm) and www.dem.state.nv.us
For further information please contact Jonathan G. Price, State Geologist and Director, Nevada Bureau of Mines and Geology by email at jprice@unr.edu or telephone (775) 784-6691 extension 5
We are pleased to make reasonable accommodations for members of the public who are disabled. If special arrangements are necessary, please notify the Committee at (775) 687-0314. Twenty-four hours advance notice is requested.

Minutes of the
Nevada Hazard Mitigation Planning Committee
8 May 2012

The Nevada Hazard Mitigation Planning Committee (NHMPC) met from 8:02 a.m. until 12:50 p.m. on Tuesday, May 8, 2012 at the Opera House, 31 South Main Street, Eureka, Nevada. These minutes and related documents are posted on the Web site for the committee (http://www.nbmg.unr.edu/nhmpc/nhmpc.htm).

Attendees included:
Elizabeth Ashby, Nevada Division of Emergency Management (DEM)
Ed Atwell*, University of Nevada Police Department
Craig dePolo, Nevada Bureau of Mines and Geology
Rick Diebold*, City of Las Vegas, Office of Emergency Management
Mike Dondero*, NV Division of Forestry
Terri Garside, Nevada Bureau of Mines and Geology
Stephanie Hicks, RO Anderson
Karen Johnson, Division of Emergency Management
Ron Lynn*, Department of Development Services, Clark County Building Department
Kim Davis*, Division of Water Resources
Russ Peacock, White Pine County Emergency Manager
Jonathan Price*, Nevada Bureau of Mines and Geology
Michael Sullivan, Eureka County Assistant Emergency Manager and EMS Coordinator
Ryan Turner*, Henderson Emergency Management
Jim Walker*, Nevada Department of Transportation

* indicates a member of the Board of Directors.

Members of the Board of Directors of the Committee who were unable to attend include:
Joe Curtis*, Storey County Emergency Management
Robert Fellows*, Carson City Public Works
Jim Reagan*, NV Energy
Andrew Trelease*, Clark County Regional Flood Control District

WELCOME AND INTRODUCTIONS

Jon Price chaired the meeting. Attendees introduced themselves. A quorum (a majority of the 13 members of the Board of Directors) was present. Jon explained that the NHMPC meeting was being held in Eureka to allow the Committee members to meet the local officials and to receive insight into both White Pine and Eureka Counties' hazards.

PUBLIC COMMENTS

No public comments were received.

APPROVAL OF MINUTES FROM February 7, 2012

The minutes of the February 7, 2012, meeting of the committee were unanimously approved. Minutes of the committee are posted on the NHMPC Web site at www.nbmg.unr.edu/nhmpc/nhmpc.htm.

ECONOMIC AND SOCIAL PROFILE, AND FUTURE DEVELOPMENT OF EUREKA AND WHITE PINE, COUNTIES

Jon Price explained the Hazard Mitigation Grant Program. Nevada has an advanced State Hazard Mitigation Plan; the enhanced plan will allow for up to 20% in additional funding for mitigation efforts after a Presidential declaration of disaster (instead of the normal 15%). The application period for the additional 20% of funding is twelve months after the disaster event.

White Pine County

Russ Peacock distributed the White Pine County Emergency Preparedness Guide and the pamphlet *"Emergency Preparedness – What to do"*. Russ reported that 90% of the population lives within 50 miles of Ely. White Pine County is very mountainous. Mining poses the largest hazard in the County because of the hazardous materials transported on the highways to the mines. White Pine County does not have a hazardous materials team. The nearest Hazmat team would need to come from West Wendover; two-hours away. Other hazards residents face are winter weather, wildfire, and flooding.

Salt Lake City and Las Vegas are both 240 miles from Ely.

Cell phone coverage is sparse. Emergency responders relied on the Highway Patrol's communications network, but the system became stressed, so the County had to stop using that system.

The County is doing well economically due to the increase in mining.

Farming and ranching have been around for many years. The smaller farms and ranches are being bought out by the larger companies.

Great Basin National Park is one of the least-visited parks in the US due to its location and lack of services.

In the 1960s, Ely suffered a lot of flooding, which required regular sandbagging. Ely is located in the bottom of a canyon. The County installed catchment dams and terracing to attempt to abate the flooding problem. However, spring runoff from Robinson Summit still poses flooding dangers, as does mine dewatering. Sandbagging was last used three years ago.

The tallest building in Ely is the six-story Hotel Nevada.

The County has two dams, but they are fairly old (Cave Creek and Duck Creek).

Eureka County

Michael Sullivan welcomed the Committee. He reported that mining built Eureka County and is still a major industry.

The topography ranges from 4,000 feet to 10,460 feet.

The County was established in 1873, has expanded twice, and currently is bounded by Interstate 80, Interstate 50, and the Union Pacific Railroad.

Ranching, mining, and county government are the main employers in the County.

Manufactured housing comprises 72% of the residential housing.

Un-reinforced masonry construction is a concern.

The closest trauma hospital is 116 miles away in Elko. Major injuries are transported by air to Elko, and in severe cases, to Reno.

The County does not have a fixed Emergency Operations Center (EOC). They have learned that when emergencies arise, they tend to work out of their trucks so they can be on site.

The proposed Mount Hope molybdenum mine will double the population of Eureka when it is in full operation.

Oil and geothermal production, and mineral exploration (primarily for gold, but also vanadium) are also contributors to the County's economy.

There are mutual-aid agreements between the surrounding counties, which give whichever emergency responder is closest to an emergency full authority to respond, no matter the jurisdiction of the responder. The tax base does not support full-time emergency responders, so the counties depend on volunteers.

Disturbed land is a haven for cheatgrass growth. Cheatgrass is an extreme fire hazard because it burns fast and hot. Fires can get out of hand extremely quickly, due to weather conditions (wind, heat, and low humidity).

Eureka County is about 79% federally managed and White Pine County is about 92%.

EARTHQUAKE HAZARDS IN EUREKA AND WHITE PINE COUNTIES

Craig dePolo and Jon Price reported that earthquake faults occur throughout Nevada. Nevada is the third most seismically active state in the US behind California and Alaska. All of Nevada is earthquake country.

There are few seismic instruments in the eastern part of Nevada, which means that we are unable to detect small earthquakes.

The first historical earthquake in Austin was on November 7, 1868. On March 23, 1872, a magnitude 5.5 occurred near Austin, causing plaster to fall in the courthouse.

In April of 1875, Eureka experienced a >5.5 magnitude earthquake. The Eureka Daily Sentinel reported on April 2, 1875, that it "*brought to the feet every man, woman, and child in town. Everyone rushed frantically to the streets, and not a few clambered up the hillsides for safety, fearful that the town was about to be demolished.*"

The Nevada Bureau of Mines and Geology recently released the map *Quaternary Faults in Nevada* (NBMG Open-File Report 09-9, available at www.nbmg.unr.edu). The online version of the map is searchable, which allows for finding the large and potentially active faults in the area of a specific address. The map is to be used for approximate fault locations and should not be used as a definitive location of faults. If planning to build in one of the zones shown on the map, it is wise to hire a geological consultant to precisely locate faults and determine their frequency of movement. By using the information icon, and clicking on a specific fault, the known information on the fault appears. The faults can be viewed on base maps showing aerial photographs or topography and roads.

Due to extension, Nevada is acquiring approximately 0.2 acres of area per year. Salt Lake City and Reno are moving apart about a centimeter a year.

Nevada Bureau of Mines and Geology's Open-File Report 09-8, *Estimated Losses from Earthquakes near Nevada Communities,* available at www.nbmg.unr.edu/dox/of098/Scenarios/OpenFileReport09-8.pdf, was distributed. The report contains HAZUS runs for 38 communities in Nevada, essentially all towns with a population of at least 500. The report contains runs for magnitudes 5, 5.5, 6, 6.5, and 7 earthquakes. The runs were compiled using a fault on the Quaternary fault map that is closest to the center of the community. The fault depth is run at 10 km (the average depth of earthquakes in the Great Basin).

According to the U.S. Geological Survey, the probability of a magnitude 6.0 earthquake within the next 50 years occurring near (within 31 miles or 50 kilometers) Eureka is approximately 10-15%, and is approximately 4-6% for Ely. The total economic loss from a magnitude 6 earthquake in Eureka is estimated at $34 million, and $44 million for Ely.

HAZUS is an excellent tool that city and county managers, emergency managers, and planners should use in hazard mitigation, planning, and emergency response and recovery exercises.

The consequences of earthquakes can be huge in Nevada, particularly if individuals are not prepared.

The Nevada Bureau of Mines and Geology was contracted by the Nevada Division of Emergency Management, using funding from FEMA and the Nevada Public Agency Insurance Pool, to compile a database of all potential un-reinforced masonry buildings (URM) in Nevada. Using data supplied by County Assessors and State Public Works, it was determined that Nevada has 23,597 potential URMs (total does not include federally-owned buildings). Of the total in the state, Eureka County has approximately 35 potential URMs, and White Pine County has 232 potential URMs. Because a large number of the URMs are historic buildings, the issue is to how to retrofit them to make them safe. With URMs being mostly +50 years old, many may have suffered damage from previous earthquakes.

The best things that can be done to prevent building damage and loss of life or injury are to be prepared to respond; mitigate structural risks, largely through having current building codes; and mitigate nonstructural risks.

The PowerPoint presentation on "Earthquake Hazards in Eureka and White Pine Counties" is available online at http://www.nbmg.unr.edu/Geohazards/Earthquakes/Presentations/Earthquake_Hazards_in_Eureka_and_White_Pine_Counties_8May2012.pdf.

WHITE PINE COUNTY FLOOD HAZARDS

No report.

PLANNING SUBCOMMITTEE REPORT

Jim Walker reported that the subcommittee recently met. They are continually working on the update to the State's plan. They would like to get the public involved, they encourage and welcome input.

The subcommittee requests that anyone doing mitigation efforts notify the subcommittee so those efforts can be reported in the plan.

They would also like to include any hazards that are not currently identified in the plan. Please let the subcommittee know of any unidentified hazards that should be included.

The rankings of the hazards in the state are being reclassified into three categories, rather than the current five.

The State's plan is revised every three years. The subcommittee's goal is to continually update the plan so when it is due for formal revision, it is already about 90% complete.

TRIBAL STATEWIDE PLANNING EFFORTS

Elizabeth Ashby reported that tribes are looking for funding to assist them in completing their Hazard Mitigation Plans.

Jon Price asked if FEMA has plans to assist those who cannot afford to prepare their plans. Elizabeth Ashby reported that the only resource available right now is to go through Homeland Security funds.

REPORT ON THE STATUS OF GRANTS

Elizabeth Ashby reported on the status of the following funded projects:

Hazard Mitigation Grant Program (HMGP)

- HMGP1540, Waterfall Fire funding – Closed
- HMGP 1583, S. Nevada 2005 Floods – Closed
- HMGP 1629, N. NV Flood – mostly completed, with an extension request by UNR for the Planning Subcommittee support.
- HMGP 1738, Fernley Floods – Lyon Co. plan consultant hired and on schedule; Dant Wash improvement Phase I Engineering completed and at FEMA for review and on schedule; URM Inventory – on schedule and close to completion; Ely Conservation seismic retrofit – application in process.

PDM (Pre-Disaster Mitigation) Grant Program

- PDM 07, awards for plans for Storey, Esmeralda, and Washoe Counties and the Henderson Sewer Project; all the plans are completed; the Henderson Sewer Project is in the construction phase.
- PDM 08, Sky Tavern Wildfire water storage tank, Clark County Mitigation Plan Update – close to completion, but needs to complete the public awareness requirement.
- PDM 09, Funding requests from Douglas County Emergency Management are under FEMA NEPA Review.
- PDM 10, City of Reno (Congressional earmark) – application in process; Lincoln Co. Plan Update – has been approved by FEMA, Churchill/Mineral County Plan is coming in under budget and Nye County Plan Update – submitted to FEMA; White Pine and Eureka Counties Plan awarded and has been started; Douglas Co. – US 395 Culvert Project, TRFP – Demo Edison Way and Storey – 6 Mile Canyon – awarded.
- PDM 2011, Elko County HMP Update, Douglas County HMP Update, Douglas St. Route 88 Culvert Project, UNR Seismological Laboratory – funding pending.
  City of Caliente Flood – under *NEPA review, Pershing/Lander/Humboldt HMP, NV State Parks Ft. Churchill – selected for further review.
- FMA 2011, Washoe County Marlin Channel Detention – selected for further review. Nevada
- Special Projects, MyPlan Nevada– funded and project started.

HAZUS, Breach of Irrigation Canals and Ditches, NHMPC funding, and My Plan Integration of new data – pending funding

Elizabeth Ashby reported that the Flood Mitigation grants will now be managed by NDEM, which will provide DEM with management cost funds, which will allow Nevada to fund additional projects.

*National Environmental Protection Act

DIVISION OF EMERGENCY MANAGEMENT UPDATE

Action items from discussion of 5-year strategic plan for NHMPC
Elizabeth Ashby reported that Jon Price is retiring as Chair of the Nevada Hazard Mitigation Planning Committee. Nominations for a replacement are being accepted. Please contact Elizabeth with nominations. Terri Garside will also be retiring on June 30th so a replacement as Executive Assistant on the Committee is also needed.

Prioritization of Grant Applications
The grant application prioritization process is not changing.

Orientation for new members
Elizabeth discussed a synopsis of what kind of training new members will receive. Elizabeth reported that Gary Dunn, Member of the Public, retired from the committee. Committee members provided a number of potential names to fill the vacant position. Elizabeth will discuss the nominations with Chief Smith. If there are other potential candidates, please forward those names to Elizabeth.

NHMPC bylaw revisions
Elizabeth distributed copies of the bylaws reviewed and reformatted by DEM's Deputy Attorney General. One change made was to remove reference to Roberts Rules of Order. The NHMPC is governed by the Nevada Open Meeting Law.

Proxies for absent committee members are no longer permitted.

Staggered committee terms were also removed from the bylaws. With the thinking that staggered terms occur with normal committee retirements.

Bylaws are being standardized for all DEM committees.

A motion was made and passed to adopt the revised bylaws.

ACTION ITEM: Elizabeth Ashby will put the nomination of a Chair and a Vice Chair on the August agenda.

ACTION ITEM: Elizabeth Ashby will provide nominees for the vacant "member of the public" position to Chief Smith

A discussion ensued regarding the changes to the Hazard Mitigation Grant Program. Elizabeth reported that DEM would like to continue to use the same process as currently in place. Mitigation projects will still be submitted by communities. The committee will then review the projects and prioritize them. When funds become available, those projects will be submitted to DEM in order of prioritization, for funding.

Kim Davis discussed the Silver Jackets Program, which provides communities with an opportunity to work with all appropriate state and Federal agencies to develop a comprehensive flood risk management program.

Craig Fugate, FEMA Director, has sent out a request for support of the National Flood Insurance Program reauthorization. Authorization of the current NFIP ends on May 31, 2012.

ANNOUNCEMENTS OF FUTURE MEETINGS

Thursday, August 9, 2012 – (Douglas County) Note that this meeting was originally scheduled for S. Nevada and has been moved to N. Nevada

Friday, August 10, 2012 - (Clark County – PENDING submission of southern Nevada applications)

Thursday, November 15, 2012 (Henderson, Nevada)

PUBLIC COMMENTS

Kim Davis mentioned that White Pine County recently received their preliminary floodplain maps and that Eureka County has received their final revised floodplain maps.

Building standards accompany the NFIP, which is a form of hazard mitigation. Keeping buildings out of the floodplain is imperative to the success of the program.

The NFIP will cover flood disasters that are not Presidential declarations.

Kim commended White Pine County for joining the NFIP.

Mike Sullivan thanked the NHMPC for holding the meeting in Eureka.

REVIEW OF ACTION ITEMS

Elizabeth Ashby will put the nomination of a Chair and a Vice Chair on the August agenda.

Elizabeth Ashby will provide nominees for the vacant "member of the public" position to Chief Smith

ADJOURN

The meeting adjourned at 12:51 p.m..

Respectfully submitted by Terri Garside, June 14, 2012.

Nevada Hazard Mitigation Planning Committee
c/o Nevada Bureau of Mines and Geology
University of Nevada, Reno/MS 178
Reno, NV 89557-0178

775-784-4415

Agenda
Nevada Hazard Mitigation Planning Committee
Thursday, August 9, 2012, at 9:45 am
EOC, East Fork Fire District, 1694 County Rd., Minden, NV

The committee may take action on items marked "Discussion/For Possible Action." Items may be taken out of the order presented on the agenda at the discretion of the chairperson. Items may be combined for consideration by the Committee at the discretion of the chairperson. Items may be pulled or removed from the agenda at any time.

The Committee may convene in closed session to consider the character, alleged misconduct, professional competence or physical or mental health of a person. (See NRS 241.030) Prior to the commencement and conclusion of a contested case or quasi-judicial proceeding that may affect the due process rights of an individual, the board may refuse to consider public comment. See NRS 233B.126.

RRR. **CALL TO ORDER AND INTRODUCTIONS (Discussion Only)** – *Chairman, Craig DePolo, Research Geologist, NBMG* - Confirm Quorum

SSS. PUBLIC COMMENT (Discussion only) – No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments are limited to 3 minutes unless the Committee elects to extend the comments for purposes of further discussion. Comments will not be restricted based on viewpoint.

TTT. **APPROVAL OF MEETING MINUTES FROM MAY 8, 2012 MEETING (Discussion /For Possible Action)** – *Chairman, Craig DePolo*

UUU. **NEVADA CYBER SECURITY PRESENTATION (Discussion Only)** - *Chris Ipsen, NV Chief Information Security Officer, NV Enterprise IT Services.*

VVV. **DOUGLAS COUNTY PRESENTATIONS REGARDING THE DEMOGRAPHICS, GOVERNMENT, ECONOMIC, SOCIAL PROFILE AND FUTURE DEVELOPMENT OF THE COUNTY- (Discussion Only)***Presenter Candace Stowell, Planning, Douglas County*

WWW. **EARTHQUAKE HAZARD IN DOUGLAS COUNTY PRESENTATION (Discussion Only) –** Earthquake HAZUS-MH** Report – *Craig DePolo, Research Geologist UNR*

XXX. **WILDLAND FIRE HAZARD in DOUGLAS COUNTY PRESENTATION (Discussion Only) -** *Tod Carlini, Fire Chief, East Fork Fire District*

YYY. **FLOOD HAZARD IN DOUGLAS COUNTY PRESENTATION (Discussion Only)–** Areas of Concern and Maps – *Erik Nilssen, Engineer, Douglas County*

ZZZ. **PLANNING SUBCOMMITTEE REPORT (Discussion Only)** *Planning Subcommittee Chair, Jim Walker, NDOT*

- **Review of the current state hazard mitigation plan's goals and action items**

AAAA. **REPORT ON THE STATUS OF OPEN PRE-DISASTER MITIGATION AND HAZARD MITIGATION GRANT PROGRAM ALLOCATED NEVADA GRANTS (Discussion Only)–** Progress Report - *Karen Johnson, Nevada Division of Emergency Management*

BBBB. **2013 UNIFIED HAZARD MITIGATION GRANT CYCLE APPLICATION PRESENTATIONS AND COMMITTEE COMMENTS (DISCUSSION ONLY)**

- **Clark County School District – Seismic Valve Replacement,** *Dimitri Theodorou, Clark Co. School District*
- **Douglas County –State Route 88 Flood Project,** *Stephanie Hicks, RO Anderson*
- **Truckee River Flood Project - Acquisition,** *Mimi Fujii, Truckee River Flood Project*
- **Elko County – Hazard Mitigation Plan Update,** *Elizabeth Ashby, Nevada Division of Emergency Management*

CCCC. **UPDATE ON: (Discussion /For Possible Action)**- *Elizabeth Ashby, Nevada Division of Emergency Management*

- ***ACTION ITEMS FROM DISCUSSION OF 5-YEAR STRATEGIC PLAN FOR NHMPC***
- ***ORIENTATION FOR NEW MEMBERS***

DDDD. **ANNOUNCEMENT OF FUTURE MEETINGS (Discussion Only) :***Chairman, Craig DePolo*
November 15, 2012 (Henderson)

EEEE. PUBLIC COMMENT (Discussion only) – No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action my be taken. Public comments are limited to 3 minutes unless the Committee elects to extend the comments for purposes of further discussion. Comments will not be restricted based on viewpoint.

FFFF. **ADJOURN -** (Discussion/**For Possible Action**)

This is a public meeting. In conformance with the Nevada Public Meeting law, I Elizabeth Ashby, posted or caused the posting of this agenda on or before Aug 3, 2012, 9:00 a.m. at the following locations:

Nevada Division of Emergency Management (Carson City); Nevada Bureau of Mines and Geology (Reno);
Clark County Government Center (Las Vegas); Clark County Department of Development Services (Las Vegas)
East Fork Fire District (Douglas County);

And on the website for the Nevada Hazard Mitigation Planning Committee (http://www.nbmg.unr.edu/nhmpc/htm) and www.dem.state.nv.us
For further information please contact Craig DePolo, Research Geologist, Nevada Bureau of Mines and Geology by email at cdepolo@unr.edu or telephone (775) 682-8770
We are pleased to make reasonable accommodations for members of the public who are disabled. If special arrangements are necessary, please notify the Committee at (775) 687-0314. Twenty-four hours advance notice is requested.

Minutes of the
Nevada Hazard Mitigation Planning Committee
August 9, 2012

The Nevada Hazard Mitigation Planning Committee (NHMPC) met from 9:47 a.m. until 2:00 p.m. on Thursday, August 9, 2012 at the East Fork Fire District, 1694 County Road, Minden, Nevada.

Attendees included:
Elizabeth Ashby, Nevada Division of Emergency Management (DEM)
Ed Atwell*, University of Nevada Emergency Management
Tod Carlini, East Fork Fire District
Joe Curtis*, Storey County Emergency Management
Kim Davis*, Division of Water Resources
Craig dePolo, Nevada Bureau of Mines and Geology
Rick Diebold*, City of Las Vegas, Office of Emergency Management
Mike Dondero*, Nevada Division of Forestry
Robert Fellows*, Carson City Public Works
Linda Goar, Nevada Bureau of Mines and Geology
Stephanie Hicks, RO Anderson
Chris Ipsen, NV Enterprise IT Services
Karen Johnson, Division of Emergency Management
Ron Lynn*, Department of Development Services, Clark County Building Department
Erik Nilssen, Douglas County Engineer
Jim Reagan*, NV Energy
Alex Trelease*, Clark County Regional Flood Control District
Ryan Turner*, City of Henderson Emergency Management
James Walker*, Nevada Department of Transportation

* Indicates a member of the Board of Directors

Members unable to attend:
Terri Garside

Welcome and Introductions

Craig dePolo chaired the meeting. Attendees introduced themselves. A quorum of the members of the Board of Directors was present.

Public Comments

Tod Carlini, Fire Chief, thanked the committee for the grant they were awarded for the update of the Douglas County Hazard Mitigation plan.

Minutes Approval

The minutes of the May 8, 2012 meeting of the committee were unanimously approved.

Nevada Cyber Security Presentation
Presented by Chris Ipsen
NV Chief Information Security Officer

There are two cyber data centers in Nevada – North and South.

Within the state, there are over 2 million miles of connections; protection is essential. The Governor lists Cyber as a #1 concern because it is very susceptible to attack.

Chris stated that there will be 20,000 attack attempts to our network just while he is speaking. Overall 2 million threats a day are thwarted in Nevada. Anyone with a $25 laptop can attack us and their level of sophistication is high.

Robert Mueller, FBI Director states "terrorism is the #1 threat and cyber threat will become #1".

The future is relying on technology more and therefore we will be more vulnerable to attack. If we are concerned about a cyber- attack we need to develop a premier training center in Nevada.

Things we can address now that could reduce 85% of problems:
- SOC monitoring (70 compromised machines in 1 month)
- Incident response
- Information sharing
- Cyber center

Currently we don't have enough people and not enough cohesiveness. We need to work together and make ourselves more aware. We need to be aware that both PC's and Mac's are vulnerable. Having Blue Tooth and WiFi makes you more vulnerable.

Douglas County Profile
Presented by Candace Stowell
Planning, Douglas County

Douglas County has 711 square miles of land area with a population density of 66 people per square mile. The largest land ownership is by the BLM. The state of Nevada owns only .3% of the land. Population growth was high from the 1970's until the last decade which has slowed. Average growth rate is now at approximately 1.4%.

The 2011 Master Plan has several hazard mitigation actions related to wellhead protection, floodplain management, storm water planning and hazardous fuel reduction. Some issues which need to be addressed are senior housing. Even though Douglas County has a high senior population, currently there is no senior housing. The county also needs to look at re-development at the lake.

One question from the floor regarding private water systems – can you use eminent domain? The answer is no, but usually they are in such bad shape, they don't need to.

Earthquake HAZUS-MH Report
Presented by Craig dePolo
Research Geologist – UNR

Nevada is the #3 most earthquake prone State. We have a history of preparedness and there has not been a recorded death in Nevada earthquakes.

Most of our earthquakes are caused by faults. Since active faults are nearly everywhere in Nevada, a 6.0 can occur anywhere in the state.

There are 3 sources for seismic hazards analysis: faults, earthquake records, and geodetic data. Geodetic data indicates Nevada is gaining .2 acre annually. About 20% of the Pacific plate movement is in Nevada.

We need to be prepared to respond . We need to mitigate structural risks, largely through building codes and avoiding faults areas of liquefaction.

Wildland Fire Hazard in Douglas County Presentation
Presented by Tod Carlini
Fire Chief, East Fork Fire District

Until 18 months ago, Douglas County had not experienced any major fires in 15 years. Since then, approximately 15,000 acres have burned which has cost local government over $600,000. Total suppression costs are estimated to be $10,000,000 in the County.

First, the hazards must be identified. Some criteria in assessing community design , construction materials, defensible space, suppression capabilities (personnel, equipment, water supply). East Fork Fire Protection District provides service to 96% of Douglas County with 14 stations, 150 suppression personnel. They handle 5200 calls for service/year.

Question from the floor: What criteria do you use to decide whether or not to fight for forest health? Rather than policy driven it is based on threat to property.

Planning Committee Report
Presented by Rick Diebold (sub for Jim Walker)

Subcommittee met on July 30, 2012 in Carson City.

1. Discussions included sources of funding impacted by the mitigation plan, either increased, decreased or eliminated not eligible.

2. Asked members to provide Elizabeth with information about mitigation activities, projects and public information events.
3. Risk assessment criteria – sent to Subject Matter Experts (SME) for review.
4. Reviewed avalanche, tornado, flood, earthquake and wildfire at SME's for review. Plan goals reviewed for adequacy/appropriateness.
5. Looked at goals and strategic actions.

Hazard Mitigation 2013 Grant Cycle Applications

1. Clark County School District – Seismic Valve Replacement – Conference call with Dimitri Theodorou of the Clark County School District
   A. The goal is to mitigate potential fires as a result of earthquakes by installing seismic valves to schools and buildings.
   B. There are approximately 357 schools impacted.
   C. Question posed – Do new schools being built have these valves installed? Yes, and these are in all new plans.
   D. Elizabeth pointed out there is a high cost-benefit ratio to this proposal.

2. Douglas County – State Route 88 Flood Mitigation Project presented by Stephanie Hicks, RO Anderson
   A. State Route 88 in Minden is a major north/south transportation route with frequent flood occurrences due in part to an elevated highway embankment which acts as a dam, an insufficient sized bridge and an abandoned abutment.
   B. Want to construct additional concrete culverts beneath the State Route. This would reduce exposure to roadway infrastructure consisting of approximately 204 homes, commercial buildings and public facilities.
3. Elko County – Hazard Mitigation Plan Update presented by Elizabeth Ashby, Nevada Division of Emergency Management
   A. Apply for money through the county manager; if they can't, Elko County will be the only one without a plan.

NHMPC Update
Presented by Elizabeth Ashby

Discussed: 5 year strategic plan, the prioritization of grant applications was revised according to the strategic planning meeting, and orientation task force completed the package for new members. The applications will be ranked at the November meeting.

The next meeting will be held on November 15, 2012 in Henderson, Nevada

The meeting adjourned at 2:00 p.m.

Respectfully submitted by Linda Goar, October 10, 2012.

Agenda
Nevada Hazard Mitigation Planning Committee (NHMPC)
Thursday, November 15, 2012, at 08:45 am

Fire Training Center, 401 Parkson Road, Henderson, NV

The committee may take action on items marked "Discussion/For Possible Action." Items may be taken out of the order presented on the agenda at the discretion of the chairperson. Items may be combined for consideration by the Committee at the discretion of the chairperson. Items may be pulled or removed from the agenda at any time.

The Committee may convene in closed session to consider the character, alleged misconduct, professional competence or physical or mental health of a person. (See NRS 241.030) Prior to the commencement and conclusion of a contested case or quasi-judicial proceeding that may affect the due process rights of an individual, the board may refuse to consider public comment. See NRS 233B.126.

GGGG. **CALL TO ORDER AND INTRODUCTIONS (Discussion Only)** – *Chair, Craig DePolo, Research Geologist, NBMG* -Confirm Quorum

HHHH. **PUBLIC COMMENT** (Discussion only) – No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments are limited to 3 minutes unless the Committee elects to extend the comments for purposes of further discussion. Comments will not be restricted based on viewpoint.

IIII. **APPROVAL OF MEETING MINUTES FROM AUGUST 9, 2012 MEETING (Discussion /For Possible Action)** – *Chair, Craig DePolo*

JJJJ. **CITY OF HENDERSON PRESENTATIONS REGARDING THE DEMOGRAPHICS, GOVERNMENT, ECONOMIC, SOCIAL PROFILE AND FUTURE DEVELOPMENT (Discussion Only) -** *Ryan Turner, Emergency Manager City of Henderson*

KKKK. **EARTHQUAKE HAZARD IN HENDERSON PRESENTATION (Discussion Only) –** Earthquake HAZUS-MH** Report – *Craig DePolo, Research Geologist UNR*

LLLL. **FLOOD HAZARD IN CITY OF HENDERSON PRESENTATION (Discussion Only)–** Areas of Concern and Maps –*Albert Jankowiak, City of Henderson*

MMMM. **PLANNING SUBCOMMITTEE REPORT (Discussion /For Possible Action) -***Planning Subcommittee Chair, Jim Walker, NDOT*

- **Status of the state hazard mitigation plan update**
- **Review and possible approval of updates to low risk hazard profiles by NHMPC**
- **Review of the 2010 state hazard mitigation plan's goals and action items**

NNNN. **Nevada Earthquake Safety Council Activity Report (Discussion Only),** *Ron Lynn, Chair*

OOOO. **State Silver Jackets Team Activity Report (Discussion Only) -** *Kim Davis, Nevada Division of Water Resources; U.S. Corps of Engineers and federal agencies flood mitigation program*

PPPP. REPORT ON THE STATUS OF OPEN PRE-DISASTER MITIGATION AND HAZARD MITIGATION GRANT PROGRAM ALLOCATED NEVADA GRANTS (Discussion Only)– Progress Report – *Elizabeth Ashby, Nevada Division of Emergency Management*

QQQQ. 2013 UNIFIED HAZARD MITIGATION GRANT CYCLE APPLICATION RANKING, (Discussion /For Possible Action) *Chair, Craig DePolo, Research Geologist, NBMG*

- **Clark County School District – Seismic Valve Replacement,** *Dimitri Theodorou, Clark Co. School District*
- **Douglas County –State Route 88 Flood Project,** *Stephanie Hicks, RO Anderson*
- **Elko County – Hazard Mitigation Plan Update,** *Elizabeth Ashby, Nevada Division of Emergency Management*

RRRR. UPDATE ON*ACTION ITEMS FROM DISCUSSION OF 5-YEAR STRATEGIC PLAN FOR NHMPC*: (Discussion /For Possible Action)- *Elizabeth Ashby, Nevada Division of Emergency Management*

i. **REVIEW AND POSSIBLE APPROVAL OF THE ORIENTATION FOR NEW MEMBERS REFERENCE PACKAGE**

SSSS. ANNOUNCEMENT OF FUTURE MEETINGS (Discussion Only) :*Chair, Craig DePolo*

February 12, 2013 (Lander or Humboldt)
May 7, 2013 (Tonopah, NV)
August 13, 2013 (Reno, NV)
November 12, 2013 (Mesquite, NV)

TTTT. PUBLIC COMMENT (Discussion only) – No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments are limited to 3 minutes unless the Committee elects to extend the comments for purposes of further discussion. Comments will not be restricted based on viewpoint.

UUUU. ADJOURN - (Discussion/**For Possible Action**)

Following adjournment, members of the Nevada Hazard Mitigation Planning Committee will take a tour of the completed Pittman-Pecos Sewer Protection and Flood Mitigation Project. No deliberation, discussion or action will be taken by the Committee while on the tour. Members of the public are welcome to join the tour, but they must provide their own transportation to and from the site. The tour will begin at 1:30 pm departing from 1901 N. Green Valley Pkwy., Henderson, NV. Cars may park in the parking lot at that location. For additional information regarding the tour, please contact Elizabeth Ashby at (775) 687-0314.

This is a public meeting. In conformance with the Nevada Public Meeting law, I Elizabeth Ashby, posted or caused the posting of this agenda on or before November 9, 2012, 9:00 a.m. at the following locations:

Nevada Division of Emergency Management (2478 Fairview Dr., Carson City, NV); Nevada Bureau of Mines and Geology (1664 North Virginia Street, Reno, NV); Clark County Government

Center (500 South Grand Central Parkway, Las Vegas, NV); Clark County Department of Development Services (4701 W. Russell Rd., Las Vegas, NV) Henderson Fire Department (Fire Training Center, 401 Parkson Road, Henderson, NV)

And on the website for the Nevada Hazard Mitigation Planning Committee (http://www.nbmg.unr.edu/nhmpc/htm) and www.dem.state.nv.us
For further information please contact Craig DePolo, Research Geologist, Nevada Bureau of Mines and Geology by email at cdepolo@unr.edu or telephone (775) 682-8770
We are pleased to make reasonable accommodations for members of the public who are disabled. If special arrangements are necessary, please notify the Committee at (775) 687-0314. Twenty-four hours advance notice is requested.

Minutes of the
Nevada Hazard Mitigation Planning Committee
15 November 2012

The Nevada Hazard Mitigation Planning Committee (NHMPC) met from 8:46 a.m. until 12:37 p.m., on Wednesday, November 15, 2012 at the Office of Emergency Management, City of Henderson, 240 Water Street, Henderson, Nevada.

Attendees included:
Elizabeth Ashby, Nevada Division of Emergency Management
Ed Atwell*, University of Nevada Emergency Management
Joe Curtis*, Storey County Emergency Management
Craig dePolo*, Nevada Bureau of Mines and Geology
Rick Diebold*, City of Las Vegas, Office of Emergency Management
Mike Dondero*, Nevada Division of Forestry
Rob Fellows*, Carson City Public Works
Martha Henson, Nevada Bureau of Mines and Geology
Al Johnson, City of Henderson, Department of Utility Services
Ron Lynn*, Department of Development Services, Clark County Building Department
Kim Davis*, Division of Water Resources
Rosemarie Reynolds, Attorney General's Office
Chris Smith, Nevada Division of Emergency Management
Dimitri Theodorou, Clark County School District Emergency Management
Ryan Turner*, Henderson Emergency Management
Jim Walker*, Nevada Department of Transportation

* indicates a member of the Board of Directors.

Members unable to attend:
Terri Garside, Member of the Public
Andrew Trelease*, Clark County Regional Flood Control District
Jim Reagan*, NV Energy Emergency Management

WELCOME AND INTRODUCTIONS

Craig dePolo opened and chaired the meeting which began with attendees introducing themselves. Craig gave a brief explanation on why continuing in-person meetings are important versus going to teleconferencing. Committee meetings being held in our communities informs and motivates those communities to do hazard mitigation planning and activities. We see firsthand projects that we have evaluated and their value in making Nevada safer from natural hazards. The Douglas County meeting in August 2012 is an example of in-person presentations being important as they were swayed to develop more comprehensive earthquake mitigation plans and Craig is helping Douglas County work on these.
A quorum of the members of the Board of Directors was present.

PUBLIC COMMENTS

No comments.

APPROVAL OF MINUTES FROM AUGUST 9, 2012

Ron Lynn made motion to approve the minutes, Rick seconded that motion, no discussion. The minutes of the August 9, 2012 meeting of the committee were unanimously approved.
Minutes of the committee are posted on the NHMPC Web site at www.nbmg.unr.edu/nhmpc/nhmpc.htm.

CITY OF HENDERSON ON THE DEMOGRAPHICS, GOVERNMENT, ECONOMIC, SOCIAL PROFILE AND FUTURE DEVELOPMENT (discussion only)
Presented by Ryan Turner
Emergency Manager City of Henderson

Demographics for the City of Henderson on the 2010 census showed the population was 257,000. In 2012, Ryan estimated that approximately 270k people are living in Henderson. The population had a 47% growth from 2000-2010, and is the 2nd most heavily populated city in the State. Forbes ranked Henderson the 2nd safest city in America in 2010. Money Magazine ranked Henderson the 66th best place to live in America in 2012.
The City of Henderson has a city manager form of government, with four council members, a city manager, and mayor. Henderson has master planned communities, Sun City Anthem, approximately 14,000 homes, Sun City McDonald Ranch, 7,500 homes, and the Green Valley Ranch area has about 18,000 homes.
Future development in Henderson includes the Tuscany Project between Black Mountain industrial complex and Lake Las Vegas, which currently has 884 houses built, but the project are under contract to build 3,100. There is also the Las Vegas National Sports Complex that will be built. Union Village Medical Complex, a $2.5B project of combining three hospitals into one. The Inspirada future home development, has a couple thousand homes already built, and is on contract to build 13,000, but Henderson does not anticipate that level. Ryan estimates ~8,000 more homes will be built. A major mail distribution center, FedEx, is building a large distribution center next to the Henderson airport.
The Office of Emergency Management started in the early 1980s. We had several significant events, there was the PEPCON explosion, May 4, 1988 claimed two lives, injured 372 people, caused over $100M in damage, and it was the largest disaster in the state's history.
Another event was the Pioneer Chlor Alkali Company, Inc. chlorine gas leak, May 6, 1991, 200 people hospitalized, 700 people sheltered, and 2,000-7,000 evacuated to other areas of the community. Olin Chlor Alkali Products (formerly Pioneer) is the largest chlorine manufacturer on the west coast. In 1991 there were no housing developments around the plant. If there was an incident today Ryan feels that 10s to 100s of thousands of people would be affected.

On July 8, 1999 Henderson had a 100-year storm, and has had four floods in the last couple of years in which the incident management team was activated, along with the recent floods of this year, 2012.
Emergency Management of Henderson participates in a variety of task forces, including but not limited to the Southern Nevada Incident Management Unified Command Type III Interagency IMT which can respond to all types of hazards. Metropolitan Medical Response System (MMRS), Nevada Task Force One, Nevada Emergency Management Coordinating Council (EMCC), Urban Area Security Initiative (UASI).

The four objectives for moving Emergency Management of Henderson forward are:

1. The Council will provide a multidisciplinary forum address current and emerging emergency management issues, so they have formed the Emergency Management Council for the City of Henderson and have representation from all departments.
2. To review and assess status of citywide all hazards including but not limited to mitigation, preparedness response through EMC of Henderson and also through the Clark County Hazardous Mitigation Plan, etc.
3. Provide strategic policy and advice to the Emergency Manager of the city management, the Diverse Management Council.
4. And to implement the provisions of the EMC charter.

The first project EMC is working on is the Nevada statewide co-op project. Each department is working on their continuity of operation plans.

The Council is preparing an Emergency Preparedness Action Matrix, taking lessons learned from exercises and having all the exercises on the matrix so you know what you need to address to keep moving forward.

The Council is structured by the emergency support function in the emergency operation plan, not necessarily by the division the person on the Council works for.

The Council recently revised their all hazard emergency management plan. Highest hazards facing Henderson are aircraft incidents as the McCarran Airport traffic pattern goes over Henderson. Civil disturbances are considered moderate risk. Earthquakes are a high risk, and the Council recently sent in an application to go to IEMC exercise for earthquake preparedness.

Extreme heat is a high risk. Flash flooding is listed as a moderate risk, although recently it was a high risk, so that is something they need to modify.

A hazmat event is considered a high risk because everything that leaves BMI complex is hazardous, whereas landslides the Council feels is a low risk. The threat of large venue fires is a moderate risk because of codes that are in place, and radiological/nuclear incidents are considered low risk.

Over the next couple years the Council wants the City of Henderson accredited under the Emergency Management Accreditation program, and have created a three and five year strategic plan. They want to continue to build relationships with the City, Region, and State, and assist when needed. The Emergency Management Accreditation Program (EMAP) has 60 standards to meet. Accreditation proves you have met certain standards, and have to maintain those standards, which will help with future funding. Reaccreditation is every 5 years.

Kim asked the question about how EMC of Henderson is involved with building codes in the community development process. Ryan answered that by being involved certain types of establishments will not be put next to a chemical plant, such as a school was not put next door to a chemical plant recently. He is also working to make sure that when people buy a home in a certain development the buyer will receive a disclosure statement saying that chemical plant is in the neighborhood.

Ron answered that the land use codes were rather lax when the county was in control of the BMI. Henderson was building into the impact areas, and being a sovereign city, there was no oversight from the county, and it is tough for the incorporated cities, monetary wise, to exclude property from development.

E. Earthquake Hazard in Henderson presentation (discussion only)
Presented by Craig dePolo, Research Geologist UNR

There are several truths, one being that any community that is not earthquake prepared, the citizens of that community finds that fact unacceptable, especially since there are ways to prepare to reduce loss of life or property from an earthquake.

Nevada is the third most earthquake hazardous state in the United States. Twenty three earthquakes have been equal or greater than 6 magnitude. Western Nevada is subject to strike/slip motion similar to California which may affect Henderson as well.

Craig showed maps of earthquake faults, earthquake maps, and geodetic deformation and noted that we have lost the folklore of earthquakes being common in Nevada with a 30-year hiatus in large earthquakes and new people moving in who have not experienced earthquakes while living in Nevada.

Reservoir-induced earthquakes began a little over a year after the initial filling of Lake Mead in 1935. Earthquake activity has been much lower since reservoir levels stabilized in about 1966 according to a 1993 U.S. Bureau of Reclamation report. Craig noted that if Lake Mead is filled quickly again it could cause more reservoir-induced earthquakes with magnitudes as large as 5.0.

The Black Hills fault is the fastest moving fault for Henderson, and has the most potential for earthquakes.

Considering the chance of an earthquake occurring within 50 years and 31 miles (50 km) of Henderson, Craig presented estimated probabilities of 50 to 60% for a magnitude 5 or greater, ~30% for a M 5.5 or greater, 12% for a M 6 or greater, 4 to 5% for a M6.5 or greater, and <0.5% for a M7 or greater earthquake. Potential earthquake losses are reported in Nevada Bureau of Mines and Geology Open-File Report 09-8, "Estimated Losses from Earthquakes near Nevada Communities." Loss projections are only considered to be accurate to within an order-of-magnitude because of the tremendous uncertainties and unknowns associated with damaging earthquakes. HAZUS results for an estimated magnitude 6 earthquake near Henderson give total economic losses of $2.5 billion.

The "My Plan" web application was introduced along with the earthquake risk associated with unreinforced masonry buildings. In a preliminary estimate, Henderson has 335 potential unreinforced masonry buildings, 206 that are residential and 129 that are commercial or public buildings.

A discussion about what is included in the HAZUS program. HAZUS modeling can be done for the California area and how it would affect Henderson/Las Vegas. Other than the local area information, estimates of areas outside the local area are included. Rick Diebold said there is information on the 1987 California earthquake and how many evacuees came to the Las Vegas/Henderson area as an example. Hector-Minor quake caused damage in Henderson. Elizabeth said she can request information from her California counterpart. Rick Diebold would like to see affects upon areas in California such as the Colton Fuel Farm. Nevada gets 80-90% of its fuel from there. What happens if the Cal-Neva Pipeline is affected, or food supplies as we get a lot of our food from California.

F. Flood hazard in City of Henderson presentation (discussion only)

Presented by Albert Jankowiak,
City of Henderson

Recent floods that occurred in August and September of 2012 were shown and discussed, including video footage of the flood events and rain gauge measurements. These thunderstorms were not typical monsoonal events and developed just outside the basin, and in one case sweeping across the basin close to the peak runoff and exacerbating that runoff .

G. Planning Subcommittee Report (Discussion/Possible Action)

Presented by Jim Walker
Planning Subcommittee Chair

Subcommittee meetings are usually the last Monday of the first month of each quarter. The last meeting was last month on the 29th and they did not have a quorum, so could not conclude any business. However there were things we still needed to discuss, which included the Hazard Mitigation Plan Update which Elizabeth addressed. The Committee members received the profiles for the low-risk hazards by email. The Subcommittee would like the Committee to look at the goals and objectives for the current plan to make sure there is nothing missing. They should include the HAZUS runs for earthquake, and for flood for the major rivers of Nevada. Hopefully it will also include wildfire areas, and then along with the demographic information then they only have two more meetings with this particular committee to approve the final plan. July is the deadline for approval by the committee, with October being the final date for submission.

The low-risk hazard profiles were reviewed and the comments from interested persons were incorporated. Craig dePolo called for a vote on the low-risk profiles and all were approved.

The next items to review were the 2010 state goals and action items. Kim Davis asked for clarification on justification on action items. Elizabeth answered that old action items need to be validated as to why they should stay on the list.

Elizabeth mentioned that the NHMPC traveling statewide fulfills one of FEMA's requirements for the State's Enhanced Hazard Mitigation plan. The requirement reads that the state demonstrate a commitment to a comprehensive hazard mitigation program through a) funding the required 25 percent match for hazard mitigation program funding, or b) Developing, adopting and enforcing building codes, or c) support local mitigation by developing councils, executive actions, partnerships to promote hazard mitigation. Nevada cannot meet this requirement with option b). Option a) may be implemented when the economy is better. Option c) is the only way Nevada can meet the requirement at this time.

H. Nevada Earthquake Safety Council Activity Report (Discussion Only)

Presented by Ron Lynn
Chair of the Nevada Earthquake Safety Council

Craig dePolo mentioned that there was no Nevada Earthquake Safety Council meeting, however, Ron Lynn reported that the Shake Out had a participation of 500,000 people statewide which was a tremendous number of participants, and included every school district in the state.

I. State Silver Jackets Team Activity Report (Discussion Only)

Presented by Kim Davis
Nevada Division of Water Resources

U.S. Corps of Engineers and federal agencies flood mitigation program

The Team is a multi-agency team of federal and state agencies to collaborate and address the flood risks in the State of Nevada. There is a team in all 50 states as Nevada has a Silver Jackets Charter now. The Silver Jack pilot project received $100k funding from the Army Corps of Engineers, and are seeking additional funding from other federal agencies, to expand and add functionality to and existing flood history website, for the Carson River watershed and build a similar website for the Walker River watershed. Having videos from *youtube* helped in a meeting in Pahrump to explain to residents why new flood maps were needed and their risk to flooding. The Team members signed the charter on November 8, 2012 in a ceremony that took place at the Governor's Office in Carson City.

J. Report on the status of open pre-disaster mitigation and hazard mitigation grant program allocated Nevada grants (Discussion Only)
Presented by Elizabeth Ashby
Nevada Division of Emergency Management

This is a quarterly report on grants. The Waterfall Fire group is finalizing their fiscal reporting. FEMA officially closed it as of June 2012. The money for the Fernley Canal Breach dam watch has not been awarded yet. It is still in the environmental review and will probably be another year before the money is awarded. The Sky Tavern Enhancement of Water Supply is ongoing. The Clark County Hazard Mitigation Plan grant had just been approved. North Tahoe Fire Protection District needs to have the environmental assessment done so that FEMA will award the money. City of Reno Wildlands Fuels Reduction project is done with the environmental assessment. The 395 Culvert Project has not been approved yet. The Truckee River Flood project is almost done; they only have the landscaping portion to do. The Lincoln County Plan was updated. White Pine County and Eureka County are both doing a regional plan. The Nye County Plan update needs more work. The Storey County Six Mile Canyon is in environmental review. That project may be withdrawn. The "My Plan" Website for risk assessment is almost done. There is a $75k grant to look for mitigation activities, for flood mitigation. The communities will need to submit plans to obtain funding. The City of Caliente Spring Heights project is in environmental review and FEMA is requesting a full environmental assessment. It will probably take another year, to a year and a half before funds are released. Pershing, Lander, Humboldt Counties are working on the hazard mitigation plan. Marlin Channel in Washoe County is a long way off. State Hazard Mitigation plan received the money which NBMG is working on. FEMA sent a list to State Public Works Board of requirements for the environmental assessment. Nevada Living with Fire program received money to enhance outreach.

2013 Unified Hazard Mitigation Grant Cycle application ranking (Discussion/For Possible Action)
Presented by Craig dePolo, Chair

The committee members ranked each county. Clark County was ranked #1, Douglas County and Elko County came in at a tie for #2.

Ron Motioned to move Elko to second place, Ryan second the motion. There were five members in favor so it was still a tie. There was a discussion that the loss of the road had in Douglas County. Ed motioned to move Douglas to second place, Rob second the motion, there were seven members in favor, 3 members opposed, so Douglas was ranked #2, and Elko #3.

Update on Action Items from discussion of 5-year strategic plan for NHMPC
Review and possible approval of the orientation for new members reference package
Presented by Elizabeth Ashby

The Action Item was the Orientation of new members. Task Force will sit with new members to go over new member task force packet. Ron Lynn moved to approve, Jim Walker seconded the move, no discussion, all approved.

Announcement of Future Meetings

February 12, 2013 (Lander or Humboldt)
May 7, 2013 (Tonopah, NV)
August 13, 2013 (Reno, NV)
November 12, 2013 (Mesquite, NV)

Public Comments

There were no public comments.

Ron Lynn talked about the National Building Institute of Building Science has reactivated the safety council.

Kim Davis reported that the minutes from the last meeting listed Andrew Trelease's first name as Alex. The item of approval of minutes from the last meeting was re-opened, Jim Walker motioned that the minutes be approved with the correction, and Rob Fellows second the motion. The minutes were approved.

Going back to the Announcement of Future Meetings, Ed Atwell indicated that the day before the November 11, 2013 meeting is a holiday, and want to know if there will be any provisions for getting there the day before. Elizabeth will take that into consideration. Joe Curtis announced that he will be on vacation.

Jim Walker brought up the subject of the bylaws that the elected chair term is for one year and the vice chair is for 1 year. When chair's one year is up, the vice-chair moves into chair position. These items will be addressed at next meeting.

Mike Dondero is retiring from his state position. The board presented him with the traditional engraved rock.

The meeting adjourned at 12:37 p.m.

Respectfully submitted by Martha Henson, November 12, 2012.

Agenda
Nevada Hazard Mitigation Planning Committee (NHMPC)
Tuesday, February 12, 2013, at 10:00 am

West Hall of the Winnemucca Convention Center, 90 W. Winnemucca Blvd., Winnemucca, NV

The committee may take action on items marked "Discussion/For Possible Action." Items may be taken out of the order presented on the agenda at the discretion of the chairperson. Items may be combined for consideration by the Committee at the discretion of the chairperson. Items may be pulled or removed from the agenda at any time.

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VVVV. CALL TO ORDER AND INTRODUCTIONS (Discussion Only) – *Chair, Craig DePolo, Research Geologist, NBMG* -Confirm Quorum

WWWW. PUBLIC COMMENT (Discussion only) – No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments are limited to 3 minutes unless the Committee elects to extend the comments for purposes of further discussion. Comments will not be restricted based on viewpoint.

XXXX. APPROVAL OF MEETING MINUTES FROM NOVEMBER 15, 2012 MEETING (Discussion /For Possible Action) – *Chair, Craig DePolo*

YYYY. REPORT FOR THE MYPLAN WEBSITE – Gary Johnson Program lead

ZZZZ. HUMBOLDT PRESENTATIONS REGARDING THE DEMOGRAPHICS, GOVERNMENT, ECONOMIC, SOCIAL PROFILE AND FUTURE DEVELOPMENT (Discussion Only) – *Di An Putnam, Mayor, Winnemucca*

AAAAA. EARTHQUAKE HAZARD IN HENDERSON PRESENTATION (Discussion Only) – Earthquake HAZUS-MH** Report – *Craig DePolo, Research Geologist UNR*

BBBBB. FLOOD HAZARD IN HUMBOLDT COUNTY PRESENTATION (Discussion Only)– Areas of Concern and Maps –*Bobby Thomas, Flood Plain Manager, Humboldt County*

CCCCC. OTHER HAZARDS IN HUMBOLDT COUNTY PRESENTATION (Discussion Only) – Areas of Concern – *Ed Kilgore, Emergency Manager, Humboldt County*

DDDDD. PLANNING SUBCOMMITTEE REPORT (Discussion /For Possible Action) -*Planning Subcommittee Chair, Jim Walker, NDOT*

- **Status of the state hazard mitigation plan update**
- **Review and possible approval of updates to medium and high risk hazard profiles by NHMPC**
- **Review of the 2010 state hazard mitigation plan's goals and action items**

EEEEE. **Nevada Earthquake Safety Council Activity Report (Discussion Only),** *Ron Lynn, Chair*

FFFFF. **State Silver Jackets Team Activity Report (Discussion Only) -** *Kim Davis, Nevada Division of Water Resources; U.S. Corps of Engineers and federal agencies flood mitigation program*

GGGGG. **REPORT ON THE STATUS OF OPEN PRE-DISASTER MITIGATION AND HAZARD MITIGATION GRANT PROGRAM ALLOCATED NEVADA GRANTS (Discussion Only)–** Progress Report *– Karen Johnson, Nevada Division of Emergency Management*

HHHHH. **ANNOUNCEMENT OF FUTURE MEETINGS (Discussion Only) :***Chair, Craig DePolo*
May 7, 2013 (Tonopah, NV)
August 13, 2013 (Reno, NV)
November 12, 2013 (Mesquite, NV)

IIIII. **PUBLIC COMMENT** (Discussion only) – No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments are limited to 3 minutes unless the Committee elects to extend the comments for purposes of further discussion. Comments will not be restricted based on viewpoint.

JJJJJ. **ADJOURN -** (Discussion/**For Possible Action**)

This is a public meeting. In conformance with the Nevada Public Meeting law, I Elizabeth Ashby, posted or caused the posting of this agenda on or before February 6 , 2013, 9:00 a.m. at the following locations:

Nevada Division of Emergency Management (2478 Fairview Dr., Carson City, NV); Nevada Bureau of Mines and Geology (1664 North Virginia Street, Reno, NV); Clark County Government Center (500 South Grand Central Parkway, Las Vegas, NV); Clark County Department of Development Services (4701 W. Russell Rd., Las Vegas, NV) Humboldt County (Sherriff's Office 50 W. Fifth Street, Winnemucca, NV)

And on the website for the Nevada Hazard Mitigation Planning Committee (http://www.nbmg.unr.edu/nhmpc/htm) and www.dem.state.nv.us
For further information please contact Craig DePolo, Research Geologist, Nevada Bureau of Mines and Geology by email at cdepolo@unr.edu or telephone (775) 682-8770
We are pleased to make reasonable accommodations for members of the public who are disabled. If special arrangements are necessary, please notify the Committee at (775) 687-0314. Twenty-four hours advance notice is requested.

Minutes of the
Nevada Hazard Mitigation Planning Committee
Tuesday, May 7, 2013, at 12:30 pm
Tonopah Convention Center, 301 W. Brougher St. Tonopah, Nevada 89049,
county seat of Nye County

Before the meeting began, Elizabeth Ashby introduced Mark Blankensop with the Nevada Division of Forestry, who will be taking Mike Dondero's place on the Committee, and then turned the meeting over to Chair Craig dePolo.

A. CALL TO ORDER AND INTRODUCTIONS

Committee Chair Craig dePolo called the meeting to order and thanked all for coming to Tonopah and thanked Tonopah emergency managers for hosting the meeting. He noted that Gary Johnson had not yet arrived but would be coming, but we would still proceed with introductions - all attendees were requested to introduce themselves. Attendees included the following persons:
** indicates a member of the Board of Directors.*

Ken Aldrich, Esmeralda County
Elizabeth Ashby, liaison with Nevada Division of Emergency Management
Cheryl Beeman, Nye County
*Mark Blankensop, Nevada Division of Forestry
*Joe Curtis, Storey County Emergency Manager
*Craig dePolo, Nevada Bureau of Mines and Geology
*Rick Diebold, City of Las Vegas, Office of Emergency Management
*Rob Fellows, Carson City Public Works
*Terri Garside, Member of the Public
Gary Johnson Nevada Bureau of Mines and Geology
Karen Johnson, Nevada Division of Emergency Management
Daphne D. LaPointe, Nevada Bureau of Mines and Geology
Darrell Lacey, Nye County
*Ron Lynn, Department of Development Services, Clark County Building Department *via teleconference*
Missy Molt, Nye County
Vance Payne, Nye County
*Jim Reagan, NV Energy Emergency Management
*Jim Walker, Nevada Department of Transportation
Henna Rasul, Attorney General's Office, *via teleconference*

A quorum of the members of the Board of Directors was ascertained to be in attendance.

B. Craig opened the floor for public comment; there was none.

C. Craig called for a motion to approve the minutes of the February 12, 2013 meeting of the NHMPC in Winnemucca, which had already been distributed to the committee and with the minor corrections which were discussed during the meeting. Jim Reagan so moved, Rob Fellows seconded the motion; Craig called

for discussion, there was none; he called for a vote and the motion passed unanimously to approve the minutes as presented.

D. **Craig asked to delay the MyPlan presentation** listed here on the agenda until Gary Johnson arrives.

E. 1. **Nye County Emergency Manager Vance Payne began a presentation on Nye County** and its particular situation and problems encountered. At over 18,000 sq. miles, it is the second largest county in the country, but has only 822,711 acres of private land. The federal government owns or manages much of it as the nuclear Test Site/Area 51/Nellis Air Force Base & Bombing Range which cover the heart of the county. The county has a population of about 46,000 with Pahrump at the far SW corner as the most populous town with a population of 38,000. Tonopah has about 3000, and the remaining 5,000 inhabitants are spread out across the many small towns, including Railroad Valley, Round Mountain, and the Duckwater/ Shoshone and Yomba Indian reservations. He said there was only one area prone to riverine flooding – the Pahrump Valley where half the valley is in the 100-year floodplain. Highway 160 has washed out twice just since Vance has been there. NDF has kept historical fire data for the area. Vance says Nye County is the safest place on earth to live as there are no tornadoes, no faults (?) no wildfire danger. However there are some dangers; the government has become comfortable with some of them such as drought, which is bad recently ; springs are drying up; fuels-reduction programs are helping reduce fire risk; Gabbs is said to be in the 80th %ile for a devastating earthquake within the next 100 years and SW of Hawthorne there has been a swarm of small quakes recently. But generally EQ and flood hazard in Nye County is low. Biggest problem is transportation-related incidents/ingress & egress along highways. He asked for questions. There was minor anecdotal commentary.

2. Craig thanked Vance for his presentation and called on **Ken Aldrich to give an update on Esmeralda County.** Ken said the County was about 80% public land and 20% mining claims has only about 970 people all involved in farming/ranching and mining and that fluctuates with the price of gold. There are only really 3 communities with population centers: Goldfield (pop.=~300), Silver Peak (a company town currently owned by Rockwood Lithium), and Dyer, (40-mile long farming community in Fish Lake Valley area west of Silver Peak). Belmont was the original County seat but Goldfield is now. Since 1973, there have been over 740 earthquakes all between 2 and 5 magnitude along hundreds of faults in the county, most not in populated areas. There have been about 20 wildfires since 1980, mainly in the Lida area. The biggest concern is HAZMAT incidents along the transportation corridors, main ones being US 95 and US 6, where there have been 17 HAZMAT incidents since 1990. Most of the population is in the younger population demographic, probably due to lower land and housing prices and greater distance to hospitals and medical facilities. There is one housing development – Chiatovich Creek, but folks deserted it once they realized what it was like there, and also it is in the 100-year floodplain, although this is largely not relevant.

Rick questioned: What building code do you use? Vance answered for Nye County: a pot-pourri – pieces and parts – just 2010 adopted Int. building Code. It's easier in Pahrump Valley, but there's an ongoing battle between North and South. Esmeralda has even less building code adherence, and Goldfield has none, no fire code, no animal control. There was a general discussion of lax codes and lack of resources and personnel for enforcement of codes especially in the rural areas. Mark Blankensop suggested that some smaller communities pool resources and share emergency managers together to solve funding problems.
We want to begin revising Community Wildfire Protection Plans; he has them here for review. Craig asked if there were any more questions?

Craig called for a 10-minute break.

F. When we reconvened, **Craig began a PowerPoint presentation on Earthquakes in Nevada** with particular reference to earthquakes along the Walker Lane which runs through Nye and Esmeralda counties. He focused on 2 M7+ EQs that affected this area: the 1872 Owens Valley earthquake and the 1932 Cedar Mountain EQ, which are earlier than anyone's current historical reference but still within the realm of possible recurrence. The closest active fault zone to Tonopah is at Lone Mountain and the closest to Goldfield is the Stonewall fault. For planning purposes, potential losses have been calculated using HAZUS for a scenario earthquake are $18 million for Tonopah and $13 million for Goldfield.

Craig offered 3 possible methods of mitigation activity to earthquake hazard:

1. Respond
2. Mitigate through use of building code adoption and avoiding faults
3. Taking action on Unreinforced Masonry Buildings (URMs). He discussed at length the recent NBMG URM study and resulting data and current status of field-verification of that data.

   He also encouraged non-structural measures that can be taken to avoid injury and damage due to EQs, and public education and outreach activities such as the –Great Nevada Shake-out" where all school students should learn and practice the —Drop, Cover, and Hold on" earthquake drill.

There was some discussion of URM data sources and sharing of anecdotal information mainly on URMS.

Craig called for a 10-minute break

D. Elizabeth introduced **Gary Johnson from NBMG to report on the MyPlan website**, which originated in California, and is now being developed in Arizona and in Nevada as a resource to planners with its capabilities for wildfire, flood, and earthquake hazards. Gary introduced the MyPlan site and what info he had added

for planning and demographics such as census data and some new things he will share. It is a protected site for which county planners will need a password from Elizabeth to use. He said it is never done being updated; it is an ongoing task and showed us some of the common functionality such as zooming and panning map tools, creating bookmarks, using icons, and the major layers for Earthquake, Wildfire, and Flood hazards. He showed the USGS feeds such as SHAKEMAP, NV base map data such as Township Range and Section, and dynamic legend info, Draw and Measure tool and Identify feature. With the Hazard data layers you can change the transparency and add live weather data from the USGS or bring in an aerial view or topo view. For an example, on earthquakes you can show Quaternary faults with buffer zones. With fire info, you can get a live feed from NDF and historical data. There is a new tool to calculate acreage within a perimeter. Under Flood data, there is a historic flood along the main street of Tonopah, sourced from FEMA data, also NDOT data. There was a question on how locals can update MyPlan data; - answer – send updates to Elizabeth and she will get it to Gary to add to the MyPlan databases.

You can compare pre-fire and post-fire images. There was a question about application to Apple devices. Gary answered that it is not easily transferable to Apple devices; Gary would have to reprogram it all to Javascript and it would be a big deal.

Cheryl asked if multiple people in a county would be able to get log-in permission and the answer was yes.

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G. **Flood Hazard in Nye County (Nye County Interim Flood Plain Manager could not make it to give a presentation)**. There was some discussion of Nye County's current floodplain map modernization especially in Pahrump area. Craig offered info on some current NBMG geologic mapping that might help them. Gary mentioned Pahrump FIRM maps on MyPlan.

H. Craig asked if there were any other hazards in Nye or Esmeralda counties that needed to be discussed. Elizabeth mentioned that Esmeralda is the only Nevada county not yet mapped by FEMA. Vance mentioned that there are miles of old mine tunnels under our feet in Tonopah, any of which could cave in during an earthquake. There was some discussion of the possibility of mapping all the old shafts, stopes and adits, but that one difficulty in doing this is the lack of good starting reference points. Joe Curtis asked about the possibility of closing old shafts and Vance replied that there was a possibility of dropping a section of Highway 95 into an old mine working if there were a sizeable earthquake. Craig asked for other comments; being none, the meeting progressed to committee reports, not necessarily in the order on the agenda.

Craig thanked Bobby for his presentation and Ken Aldrich of Esmeralda County.

I. **Jim Walker, Chair of the NHM Planning Subcommittee gave an update on the Status of the state hazard mitigation plan update**. He reported that edits

to the plan will be due soon and most of the High and Medium/Significant risk hazard profiles have been updated (except HazMat and Terrorism/WMD) and we need a motion to approve them as presented earlier to the Committee.

Craig called for a motion to approve the HazMat and Terrorism/WMD revised risk hazard profile Subsections of the 2013 Nevada Hazard Mitigation Plan:

Jim Walker made the motion to approve these Subsections; Terri Garside seconded it. In discussion, Jim Reagan noted that the ranking of terrorism was missing from the title (this will be corrected). All were in favor and the motion passed unanimously.

Elizabeth asked all Committee members to please review the 2010 state hazard mitigation plan's goals and action items for any changes that need to be made for inclusion in the 2013 Plan. Please do this before May 22 so they can be voted on. Terri asked if the Boston bombing has changed anything; Jim said no it had not as our plan already has a high-level plan in place. Jim also mentioned that FEMA may be changing from a three-year plan update cycle to a five-year update cycle. Gary mentioned that California has not been updating their plan in a timely manner and is crunching to get it done.

Q: What good is the Enhanced status? A: Helps NV get a higher % grant funding. Terri
Q: How many states have enhanced plans? A: 8

J. Craig called on Ron Lynn, Chair of the **Nevada Earthquake Safety Council**, for a brief report of their activities. Elizabeth reported on a meeting of Program Managers – a lot of good came out of the meeting- much discussion of dwindling funds and what will happen if Congress does not fund earthquake programs. There were 3 days of talks about Damage Assessment Teams and how they will be credentialed. The USGS will create a methodology to create a matrix for Emergency Managers to take action on emergencies. NESC Seattle meeting wrap-up: two hour training for people on FEMA damage Assessment; flyers on public awareness on earthquakes and how to prepare for them; and developing a fact sheet for congressional Representative. Willingness for more cooperative partnerships with other states on earthquake hazards. NESC will meeting on May 30.

K. Craig called for an update on the **State Silver Jackets** team activity. Elizabeth reported in Kim Davis' absence. She described the team as a US ACE-led joint Federal/State initiative for flood mitigation. The State Floodplain Manager has done a great job on a project on a Chronology of Walker River flooding – need to do more rivers – but no more money – need more grant funding to expand the project to more rivers in Nevada.

L. Craig called for a report on the status of open pre-disaster mitigation and hazard mitigation grants from Karen Johnson. Karen had already prepared and distributed a spreadsheet with all the details of these grants to the committee and led them through the pertinent details of the status of each one. Some grant

money was unfortunately going back to FEMA because it could not be used within the scope of the work; need more applications. Elizabeth and Karen said there would be grant application workshops May 29 in Las Vegas and June 6 in Reno. Karen had a question on obtaining a 12-month extension on paying back grant funds;Elizabeth said some ($36 million) had been spent nationwide, and to submit applications and we will rank them and fund whatever we get. Craig said that NBMG has a list of projects ready to go if we have a disaster. Jim Walker added that they could add to the spreadsheet the year of the disaster, and Jim Reagan said NV has been very successful in getting grant-supported projects funded.

M. Craig announced the **dates and venues of the next meetings** of the Nevada Hazard Mitigation Planning Committee as follows:

August 13, 2013 in Reno, NV: Goal – to approve the State Hazard Plan

November 12, 2013 in Mesquite, NV

N. PUBLIC COMMENT. Craig opened the floor for public comment as follows:

Cheryl mentioned Low Impact development – needs information on it. Rob replied that Washoe County and Reno have info on Low Impact development that he can help her get. Rick also said he knows someone in Clark County has it too (possibly Peter Jackson?) and he will find out more and get back to her on that. Cheryl asked if it were a feasible thing for a community and Rob answered yes; Eliz. replied that Elko has done it.

Craig called for a moved to adjourn and Rob Fellows moved to adjourn; Jim Walker seconded the motion. All were in favor and the meeting was adjourned.

Respectfully submitted, Daphne LaPointe, NBMG, Aug 12, 2013

STATE OF NEVADA
MEETING NOTICE AND AMENDED AGENDA
Nevada Hazard Mitigation Planning Committee

Name of Organization: Nevada Hazard Mitigation Planning Committee
Meeting Location: Great Basin Science Sample and Records Library, 2nd Floor Conf. Room, 2175 Raggio Lane, Reno, Nevada

Date and Time of Meeting: Tuesday, August 13, 2013, 8:30 am

The committee may take action on items marked "Discussion/For Possible Action." Items may be taken out of the order presented on the agenda at the discretion of the chairperson. Items may be combined for consideration by the Committee at the discretion of the chairperson. Items may be pulled or removed from the agenda at any time.

The Committee may convene in closed session to consider the character, alleged misconduct, professional competence or physical or mental health of a person. (See NRS 241.030) Prior to the commencement and conclusion of a contested case or quasi-judicial proceeding that may affect the due process rights of an individual, the Committee may refuse to consider public comment. See NRS 233B.126.

14. **CALL TO ORDER, INTRODUCTIONS AND ESTABLISH QUORUM** – *Chair, Craig dePolo, Research Geologist, NBMG*

15. **PUBLIC COMMENT**– (Discussion only) – No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments may be limited to 3 minutes per person at the discretion of the Chair. Comments will not be restricted based on viewpoint. *Chair, Craig dePolo*

16. **APPROVAL OF THE MEETING MINUTES FROM May 7, 2013** (For possible action) – *Chair, Craig dePolo*

17. **REPORT FOR THE MYPLAN WEBSITE** (Discussion only) – Gary Johnson, Program Lead, UNR NBMG

18. **EARTHQUAKE HAZARD IN WASHOE PRESENTATION** (Discussion only). – Earthquake HAZUS-MH** Report – *Craig dePolo, Research Geologist UNR*

19. **IRRIGATION DITCHES IN RENO** PRESENTATION (Discussion Only) – Earthquake HAZUS-MH** - *Craig DePolo. Research Geologist, UNR*

20. **WASHOE COUNTY PRESENTATIONS REGARDING THE DEMOGRAPHICS, GOVERNMENT, ECONOMIC, SOCIAL PROFILE, FUTURE DEVELOPMENT AND HAZARD MITIGATION PLAN STATUS** (Discussion only) – *Aaron Kenneston, Emergency Manager, Washoe County*

21. **OTHER HAZARDS IN WASHOE COUNTY PRESENTATION** (Discussion Only) – Areas of Concern – *Aaron Kenneston, Emergency Manager, Washoe County*

22. **FLOOD HAZARD IN WASHOE COUNTY PRESENTATION** (Discussion Only) – Areas of Concern and Maps – *Kimble Corbridge, Flood Plain Manager, Washoe County*

23. **PRESENTATION ON TRUCKEE RIVER FLOOD PROJECT STATUS** (Discussion Only) – Areas of Concern and Maps – *Mimi Fujii-Strickler, Government Affairs and Administrative Manager, Truckee River Flood Management Authority (TRFMA)*

24. **PRESENTATION OF COMPLETED HAZARD MITIGATION ASSISTANCE GRANT APPLICATIONS** (Discussion Only) –

a. TRFMA – Elevations and Demolition Project – *Mimi Fujii-Strickler, Government Affairs and Administrative Manager, Truckee River Flood Management Authority (TRFMA)*

25. **PRESENTATION OF PROPOSED HAZARD MITIGATION ASSISTANCE GRANT APPLICATIONS** (Discussion Only)

a. **Clark County School District**
b. **Douglas County State Route 88**
c. **Others to be determined**

26. **PLANNING SUBCOMMITTEE REPORT** (Discussion/For Possible Action) – *Planning Subcommittee Chair, Jim Walker, NDOT*

a. Status of the state hazard mitigation plan update
b. Review and possible approval of Section 4 and 6 and 2013 plan's goals and action items
c. Approval of submission of plan to FEMA

27. **NEVADA EARTHQUAKE SAFETY COUNCIL REPORT** (Discussion Only) – Ron Lynn, Chair

28. **REPORT ON THE STATUS OF OPEN PRE-DISASTER MITIGATION AND HAZARD MITIGATION GRANT PROGRAM ALLOCATED NEVADA GRANTS** (Discussion Only) – Progress Report – *Karen Johnson, Nevada Division of Emergency Management*

29. **ANNOUNCEMENT OF FUTURE MEETINGS** (Discussion Only) – Chair, Craig dePolo

a. November 12, 2013 (Mesquite, NV) – *may be rescheduled due to grant deadlines*
b. February 11 or 13, 2014 (TBD)

30. **PUBLIC COMMENT** (Discussion only)– No action may be taken upon a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action may be taken. Public comments may be limited to 3 minutes per person at the discretion of the Chair. Comments will not be restricted based on viewpoint.

31. **ADJOURN** – (For possible action)

This is a public meeting. In conformance with the Nevada Public Meeting Law, this agenda was posted or caused to be posted on or before 9:00 a.m. on August 8, 2013 at the following locations:

Nevada Division of Emergency Management (2478 Fairview Dr., Carson City, NV)
Nevada Bureau of Mines and Geology (1664 North Virginia Street, Reno, NV)
Clark County Government Center (500 South Grand Central Parkway, Las Vegas, NV)
Clark County Department of Development Services (4701 W. Russell Rd., Las Vegas, NV)
Washoe County (Emergency Management Office, 5195 Spectrum Blvd., Reno, NV)
Website for the Nevada Hazard Mitigation Planning Committee
http://www.nbmg.unr.edu/nhmpc/nhmpc.htm and www.dem.state.nv.us

We are pleased to make reasonable accommodations for members of the public who are disabled. If special arrangements for the meeting are necessary, please notify the Division of Emergency Management at (775) 687-0300. 24-hour advance notice is requested. Thank you.

For further information about supporting documentation, please contact Craig dePolo, Research Geologist, Nevada Bureau of Mines and Geology by email at cdepolo@unr.edu or telephone (775) 682-8770. Supporting documentation is stored at NBMG, 1664 North Virginia Street, Reno, NV 89503

Nevada Hazard Mitigation Planning Committee (NHMPC)
DRAFT Meeting Minutes – Tuesday, August 13, 2013
Location: Great Basin Science Sample and Records Library
2nd Floor Conference Room, 2175 Raggio Lane, Reno, NV

1. Call To Order, introductions and establish quorum

Craig dePolo opened the meeting at 8:30. He thanked Karen and Elizabeth for organizing the meeting. Introductions were made of those present.

MEMBERS:
Craig dePolo, NBMG
Ed Atwell, WCEM
Ron Lynn, NESC
Rob Fellows, Carson City, Flood Mgmt Floodplain manager
Jenna Damon, NDWR
Terri Garside, Member of Public
Rick Diebold, City of Las Vegas
Rick Trelease, Clark County Flood Control
Jim Walker, NDOT
Jim Reagan, NV Energy

STAFF/OTHER
Elizabeth Ashby, NDEM
Henna Rasul, AG
Mimi Fujii-Strickler, TRFMA
Kimble Corbridge, WCPW,

Stephanie Hicks, RO Anderson
Karen Johnson, NDEM
DD LaPointe, NBMG
Janell Woodward, NDEM
Aaron Kenneston, WCEM

MEMBERS NOT PRESENT:
Joe Curtis

2. Public Comment

Craig dePolo, Chairman, opened the meeting for comments from the public; there were none.

3. Approval of meeting minutes from May 7, 2013

An incorrect copy of the minutes was inadvertently printed out for meeting copies. It was felt that they were correct except for the ending public comments sections on the last page. Craig dePolo called for a motion to accept the minutes with the corrections to the last page. _____ moved and _____ seconded. The motion was passed.

4. Report for the MyPlan website – Gary Johnson

Gary Johnson from NBMG gave a short presentation on the MyPlan website explaining what it showed and how it worked. There was some trouble with the internet connection and he was unable to access information on the site. MyPlan is for those who do not have GIS skills and deals with Fire, Flood and Earthquakes with links to USGS. Gary mentioned that all the funding for MyPlan was soft money and wanted the committee to be aware of this fact in regard to long-term maintenance of the website. Questions were asked regarding access to the site. It is a password-protected site and anyone

from the committee or otherwise interested in accessing the site should contact Elizabeth Ashby for the proper credentials to access the site. Several communities have requested access to the site. MyPlan contains some confidential information and this is the reason it is a secure site. Gary stated he would like to provide a public-facing site also. Craig made a recommendation to Ron Lynn and NESC to reassess the categories for URM.

5. Planning subcommittee report – Jim Walker

The plan needs to be updated and approved to send to FEMA by the end of August. Jim Walker thanked Elizabeth Ashby and DD LaPointe for all of their hard work on the project. It is basically complete but they are still waiting for the subcommittee to complete the STAPLE-E ranking of strategies. There will be a special meeting on August 29 to complete this process. Jim stated they are looking for the planning committee to approve the plan as a whole pending some minor edits so that it can be sent forward to FEMA for their approval. The plan has been posted on the NHMPC website. The incomplete sections include items such as the meeting minutes and the ranking. Craig dePolo entertained a motion to approve the subcommittee's work to produce the Nevada Hazard Mitigation Plan with the portions to be completed at the judgment of the chair. Jim Walker moved to accept. Ed Atwell seconded. The motion was passed. The process will begin again immediately, once the current plan is approved, to update the plan for the next update cycle. We are one of 10 states with a completed hazard mitigation plan. Ron Lynn asked about press regarding this fact and Elizabeth Ashby stated she could obtain a press release for this.

6. Earthquake Hazard in Washoe County presentation – Craig dePolo

Craig dePolo gave a presentation on earthquake hazards in Washoe County. Washoe County is fairly sophisticated with regard to earthquakes compared to some of the smaller communities. Most people think it is unacceptable to be unprepared after an earthquake happens. In discussing earthquake threat, Craig stated we discuss earthquakes themselves, the faults on which they occur, and the loading mechanisms. There is no part of the state that does not have earthquakes though money has allowed for instrumentation to measure earthquakes in more of the eastern portions of the state. We have gone quite a while, since 1960, without many larger earthquakes. This makes it easy to forget that we live in earthquake country. An overview of the history of Nevada earthquakes going back to the 1850s was given. Mitigation for earthquakes can have more than a one-time benefit. Strike-slip faults cause far more damage. HAZUS runs have been utilized to estimate risk. The more recent Well's earthquake is often utilized for comparison. Craig also covered unreinforced masonry (URM) buildings. There are about 23,000 URM buildings in Nevada. The largest URM problem in Nevada is in Washoe County. He called this a Salt Lake City problem that needs Salt Lake City response. Finally, Craig stated that he would not be surprised if the next large earthquake happened right here in Washoe County.

7. Irrigation Ditches in Reno presentation – Craig dePolo

Craig dePolo stated they are halfway through the study of the irrigation ditches in Reno. Desert Research Institute (DRI) is working on the project with them. There have been

historical ditch failures and there is more urban buildup. The study is asking where some of the most hazardous irrigation ditches are and how can we mitigate against them and beginning with the Steamboat ditch. Washoe County and City of Reno are helping with the study. Another question being asked is how many inches per hour of precipitation it takes to overwhelm a ditch and what can be done to mitigate this problem?

8. Washoe County presentations regarding the demographics, government, economic, social profile, future development and hazard mitigation plan status/other hazards in Washoe County presentation – Aaron Kenneston

Aaron Kenneston, Washoe County Emergency Manager, gave a dual presentation covering both the Washoe County Hazard Mitigation Plan as well as his pitch for grant money to help cover costs of updating their plan which is due in 2015.

The Washoe County Hazard Mitigation Plan was presented. The plan was last updated in 2010 and they are looking to begin their update for 2015. They are partnered with two cities and two tribes including Reno, Sparks, the Pyramid Lake Tribe, and the Reno-Sparks Indian Tribe. The 2010 update was their first attempt at doing one collaborative plan. They had nine total declarations with two of them for snow which were back-to-back. They have utilized University of Nevada, Reno (UNR) resources in historical hazard determination along with the standard process of mitigation. The 2008 economic downturn affected the values indicated in the 2010 plan and changed the stats. These values will most likely change for the 2015 plan update. They are working more closely with the private and charter schools and other healthcare facilities. Washoe County would like to work toward having more current risk and vulnerability information for the 2015 plan.

Aaron addressed a need to stop utilizing the 100-year and 500-year terminology as this leads the public to underestimate the risk of flood. Elizabeth Ashby interjected that the flood area would be a great place to add to their grant application. The application is asking to spend time with DRI and get a better idea of what can be done for drought and water issues in the area along with looking at building plans regarding where to build and where not to build with regard to flood risk. Most of the dam failure threats are for dams that are not in our area.

Nevada is the third most seismically active state in the US. Also covered was the hazardous material transportation through the area. They would like to spend time with the experts at UNR and DRI with this 2015 update to ensure that they have the most current information regarding the various hazards. Karen Johnson reminded Aaron that they need to wait until they get the award before they spend money they would like to have covered. Elizabeth stated it is hoped they would receive award money by June 2014. They asked for an award total of $80,000 with $20,000 in-kind match.

9. Flood Hazard in Washoe County presentation – Kimble Corbridge

Kimble Corbridge gave a presentation on the flood hazard in Washoe County. He stated flood was the main hazard in this area. The presentation included the flood history of the area with pictures from the various floods over the last 100 years. Debris that occurs during and after a flood is quite significant. Equipment is required to remove all of this debris to keep water flowing. The Truckee River runs through town and the Truckee Meadows is where the water ponds up. People have a misconception regarding the risk of flood and Kimble stated there is really a 100% chance of flooding.

In 2008, they joined the community rating system (CRS) and received a rating class 7. All the flood insurance premiums for the unincorporated areas receive a 15% discount.

This saves a collective $100,000 a year on premiums for the unincorporated areas. There is a requirement to recertify every year. Every five years they require re-verification. They have over 80 flood maps in the Truckee Meadows. There are 140 maps in Washoe County and all have been digitized. These maps are available on their website.

10. Truckee River Flood Project Status presentation – Mimi Fujii-Strickler

Mimi Fujii-Strickler gave a presentation on the Truckee River Flood Project status. The Truckee River is a closed system going from Lake Tahoe to Pyramid Lake. The original plan for the Truckee River Flood Project was to go from downtown Reno all the way to Pyramid Lake. Economic and political changes have caused the program to be scaled back. Currently the plan is to go to Wadsworth. The flood project says they are the definition of insanity. They keep doing the same thing over and over again. The flood results have been the same. Mimi stated flooding is not always on the river. There can be different types of events that can cause other types of flooding. They are studying what can be done to restore at Vista narrows to help with some of the head cutting and restore vegetation to this area. Mimi stated people tend to develop flood amnesia and forget the previous flood event.

The official name of the project is the Truckee River Flood Management Authority (TRFMA). They were originally under Washoe County. Reno, Sparks and Washoe County came together to make up the committee for the Truckee River Flood Project. Last year they became an independent entity which allowed them to charge a flood rate (rather than calling it a tax). It was necessary for them to become their own authority in order to charge a rate. They received permission from the Legislature to charge this rate. They are now a smaller group and all votes must be unanimous. This works well when it works and for the most part they are able to work together. Their primary goal is flood damage reduction features including levees, flood walls, etc. Second priority includes eco systems and restoration.

Completed projects include the Reno Sparks Indian Colony flood wall and levee. They partnered with the State of Nevada, Walmart, Flood Project and the City of Reno. They received Project of the Year for this project from American Public Works Association (APWA).

Current and future projects include Tracy and the Virginia Street Bridge. This is the worst-rated bridge in Nevada. The bridge replacement cost is $20 million. This is a pony truss design. Washoe County is up for five bridge replacements, each with a cost of $20 million.

The cost for the entire project is quite high but everyone benefits from the project being completed. Whether or not someone has flooding in their immediate area, they receive benefit if they work or shop in an area that floods. They are looking to start construction in 2017. It is unclear whether this is realistic or not.

Finally, she spoke about land acquisition and the changes that will eventually occur there. Of note, the grant was begun in 2009 and they are finally got funding in 2011 and the rest was completed in 2013.

Elizabeth Ashby asked Mimi to discuss the project in Hidden Valley for the elevation of homes. TRFMA has begun a home elevation program. This is more cost effective and will take these homes out of the floodplain. About 60 homeowners have applied. There is an IRS ruling that is preventing this from going forward and they are working with Senator Reid's office to facilitate changing this. This IRS requires the public to reflect

any money for this type of project to be claimed as income for tax purposes. The other option is to get the money from FEMA and then the IRS treats this money differently.

11. Presentation of completed hazard mitigation assistance grant applications

Emergency Management did not ask Clark County to present again as most everyone has already heard their presentation. Their project is placement of seismic valves in Clark County School System. The grant is being split into two projects because of the cost cap.

Stephanie Hicks presented on the Douglas County State Route 88 project. This is an Flood Management Assistance (FMA) funding project. This is a regional flood control problem. The goal is to create concrete culverts below State Route 88. The partners have continued to commit their match. They are hoping to keep the project alive while they continue to have these match commitments. One of the main problems is that the highway was elevated when it was created and acts as a levee on the east side of Hwy 88 holding the water in that area. The bridge is of insufficient size. They have looked at various options for this problem.

Craig dePolo stated NHMPC ranked three projects last year. The two other projects being considered are Washoe County projects.

12. Presentation of proposed hazard mitigation assistance grant applications

FEMA has changed how they are allocating grant funds. Every state is limited to five projects with a $250,000 cap for each project. Tahoe Fuels Reduction Project has received funds and the Caliente Youth Center environmental review is nearly complete. Six Mile Canyon is hoped to be funded early next year.

13. Nevada Earthquake Safety Council Report – Ron Lynn

Ron Lynn gave an overview with a tentative agenda for the upcoming joint meeting for NESC with some of the neighboring states to be held November 13, 2013 in Las Vegas. This will involve Colorado, Idaho, and Utah. Arizona has been invited but there has been little response at this point. This will be a landmark meeting. There is a NESC quarterly meeting tomorrow, August 14.

Craig dePolo stated they are making an appeal to USGS that would significantly raise the risk of earthquakes in the Las Vegas area.

14. Report on the status of open pre-disaster mitigation and hazard mitigation grant program allocated Nevada grants

Karen Johnson stated 1629 is in the process of being closed. As far as 1738, the City of Reno is going to deobligate the Dant Wash funds as they work cannot be completed for the amount awarded as well as other contributing factors.

FEMA just funded the 2009 PDM funding for Tahoe Douglas. For 2010, the Nye County plan was completed and submitted to FEMA for their courtesy review. Gary Johnson traveled to Tonopah to present MyPlan. Cooperating Technical Partners (CTP) – Elizabeth and Karen are continuing tabletop exercises. Under 2012, the National Environmental Policy Act (NEPA) review is going along for the State Public Works

Board. With management costs, NDEM gave Division of Forestry a small amount for GIS help with state maps.

15. Announcement of future meetings

The next meeting is scheduled for November 12, 2013 in Mesquite. A tentative meeting is scheduled for February 11 or 12, 2014 meeting with date to be confirmed. A special meeting will be scheduled for the last week of September-beginning of October to complete application ranking and finalization. Ranking information will be distributed when applications are complete for review.

16. Public Comment

Craig dePolo asked for any public comment; there were none.

17. Adjournment

Craig dePolo adjourned the meeting.

Respectfully submitted by:
Janell Woodward
Nevada Division of Emergency Management
2478 Fairview Drive
Carson City, NV 89701

APPENDIX E

Nevada Administrative Code: Emergency Management

NAC 414.105 Application for assistance: General requirements. (NRS 414.135)

1. Except as otherwise provided in subsection 3, a state agency or political subdivision that seeks assistance from the Emergency Assistance Account for an emergency or disaster must submit, in writing, an application for assistance to the Division in accordance with the requirements for the application set forth in this section.
2. A state agency or county submitting an application for assistance from the Emergency Assistance Account must submit the application for assistance directly to the Division.
3. Before a city may submit an application to the Division for assistance from the Emergency Assistance Account, the city must apply for any available assistance from the county in which the city is located.
4. An application for assistance from the Emergency Assistance Account for an emergency or disaster must be received by the Division.
    (a) Within 30 days after the determination of an emergency or disaster, if the applicant is a state agency or county; or
    (b) Within 45 days after the determination of an emergency or disaster, if the applicant is a city.
5. Each application for assistance from the Emergency Assistance Account must include the following:
    (a) A copy of the declaration of emergency or disaster.
    (b) Any official report of a governmental entity concerning any actual or potential threat to the life, health, safety or property of persons in this state.
    (c) Any professional reports or certifications supporting the existence of an emergency or disaster.
    (d) Any preliminary damage assessment conducted:
        (1) If the applicant is a state agency, by officials of the agency and a preliminary damage assessment team deployed by the Division to arrive at a consensus pertaining to the preliminary damage assessment; or
        (2) If the applicant is a political subdivision, by a preliminary damage assessment team.
    (e) A full disclosure of the financial records of the applicant for a determination of the financial need of the applicant by the Division.
    (f) A certification that the existing financial or physical resources of the applicant are insufficient and no other funding sources are available to support all the estimated costs in providing a satisfactory remedy to the emergency or disaster. Such a certification from a state agency must be submitted by the Budget Division of the Department of Administration.
    (g) A certification that all other available resources have been exhausted, including, without limitation, interlocal agreements, mutual aid agreements and private resources.

(h) A description of all the projects to be paid, in whole or in part, by any allocation from the Emergency Assistance Account.

(Added to NAC by Div. of Emergency Mgt. by R202-01, eff. 4-24-2003)

NAC 414.110 Application for assistance: Duties of Division upon receipt. (NRS 414.135)

Upon the receipt of an application for assistance from the Emergency Assistance Account, the Division will:

1. Verify the declaration of emergency or disaster.
2. Verify that the emergency or disaster meets the criteria as to a threat to the life, safety, health or property of persons in this state.
3. Review any professional reports or certifications supporting the existence of an emergency or disaster.
4. If the applicant is a state agency and a preliminary damage assessment team has not been deployed before application is made, appoint a preliminary damage assessment team to work with officials from the agency to conduct a preliminary damage assessment.
5. Review the financial records of the applicant for a determination that the applicant has exhausted or will exhaust the existing financial or physical resources as a result of the emergency or disaster.
6. Review the certification of financial need submitted by the applicant.
7. Verify that the applicant has exhausted all other available resources.
8. Review the projects submitted for approval by the Division.

(Added to NAC by Div. of Emergency Mgt. by R202-01, eff. 4-24-2003)

NAC 414.115 Allocation and expenditure of money for emergency or disaster. (NRS 414.135)

1. Except as otherwise provided in subsection 2, an allocation from the Emergency Assistance Account for an emergency or disaster must be expended within 60 days after the approval of the allocation by the Division, unless such time is extended by the Division based upon a showing of good cause by the requesting entity.
2. An allocation for a project that the Division reasonably determines to be a long-term project pertaining to the health or safety of human life must be expended within the fiscal year in which the allocation is approved by the Division, unless such time is extended by the Division based upon a showing of good cause by the requesting entity.
3. A request for an extension of the time in which an allocation is required to be expended must be submitted to the Division in writing and approved by the Division before the expiration of the period in which the allocation is required to be expended pursuant to this section.
4. Any money advanced but not expended within the period required pursuant to this section must be returned to the Emergency Assistance Account. Any money returned or obligated but not

expended within the period required pursuant to this section will be made available for reallocation.

(Added to NAC by Div. of Emergency Mgt. by R202-01, eff. 4-24-2003)

NAC 414.120 Allocation and expenditure of money pursuant to subsection 4 of NRS 414.135. (NRS 414.135)

1. A state agency or political subdivision that seeks an allocation of money pursuant to subsection 4 of NRS 414.135 must submit, in writing, an application to the Division.
2. Any money allocated from the Emergency Assistance Account pursuant to subsection 4 of NRS 414.135 must be expended within 60 days after the approval of the allocation by the Division, unless such time is extended by the Division based upon a showing of good cause by the requesting entity.
3. A request for an extension of the time in which an allocation is required to be expended must be submitted to the Division in writing and approved by the Division before the expiration of the period in which the allocation is required to be expended pursuant to this section.
4. Any money advanced but not expended within the period required pursuant to this section must be returned to the Emergency Assistance Account. Any money returned or obligated but not expended within the period required pursuant to this section will be made available for reallocation.

(Added to NAC by Div. of Emergency Mgt. by R202-01, eff. 4-24-2003)

NAC 414.125 Completion of project: General requirements. (NRS 414.135)

1. Each project must be completed within 90 days after the date the application was approved by the Division, unless such time is extended by the Division based upon a showing of good cause by the requesting entity.
2. A request for an extension of time to complete a project must be submitted to the Division in writing and approved by the Division before the expiration of the period required pursuant to subsection 1.
3. If the period authorized for completion of a project is more than 90 days or is extended to more than 90 days, the applicant shall submit quarterly reports of each project to the Division. Every applicant shall submit a final report of each project to the Division not later than 30 days after the end of the period authorized to complete the project.

(Added to NAC by Div. of Emergency Mgt. by R202-01, eff. 4-24-2003)

NAC 414.130 Payments from Account on basis of reimbursement or advance funding. (NRS 414.135)

1. Except as otherwise provided in this section, all payments from the Emergency Assistance Account must be made on the basis of reimbursement.

2. Assistance will be provided from the Emergency Assistance Account on a basis of advance funding only if:

   (a) The applicant is unable to begin recovery from the emergency or disaster without advance funding; and

   (b) The amounts budgeted by the applicant for an emergency or disaster are not sufficient to support the purchase of equipment or supplies.

3. Advance funding will be provided at a maximum of 25 percent of the total cost of the project. Progressive advances will be provided based on the percentage of the project that has been completed and the submission of documentation evidencing all costs incurred to date.

(Added to NAC by Div. of Emergency Mgt. by R202-01, eff. 4-24-2003)

NAC 414.135 Requests for reimbursement from Account. (NRS 414.135)

An applicant submitting a final request for reimbursement shall submit documentation evidencing all costs incurred for the project not later than 60 days after the completion of the project. An applicant may submit periodic requests for reimbursement during a project that the Division determined to be a long-term project pursuant to NAC 414.115. Upon the receipt of a request for reimbursement, the Division will:

1. Review the eligibility of the project costs for money from the Emergency Assistance Account;
2. Require documentation evidencing all costs claimed on the request for reimbursement;
3. Verify the availability of money approved for the project; and
4. Process any claim that has been approved by the Division for payment to the applicant.

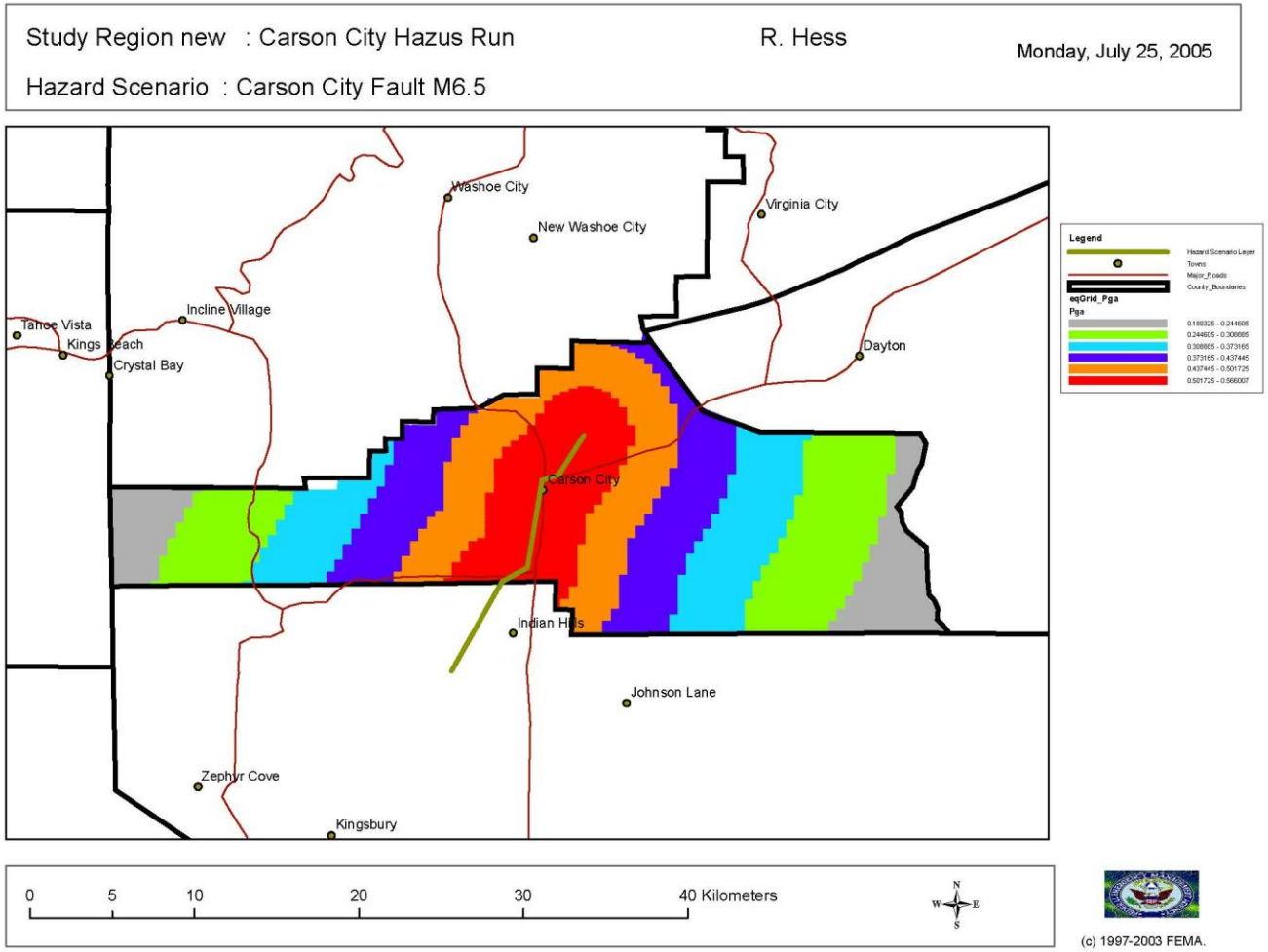
(Added to NAC by Div. of Emergency Mgt. by R202-01, eff. 4-24-2003)

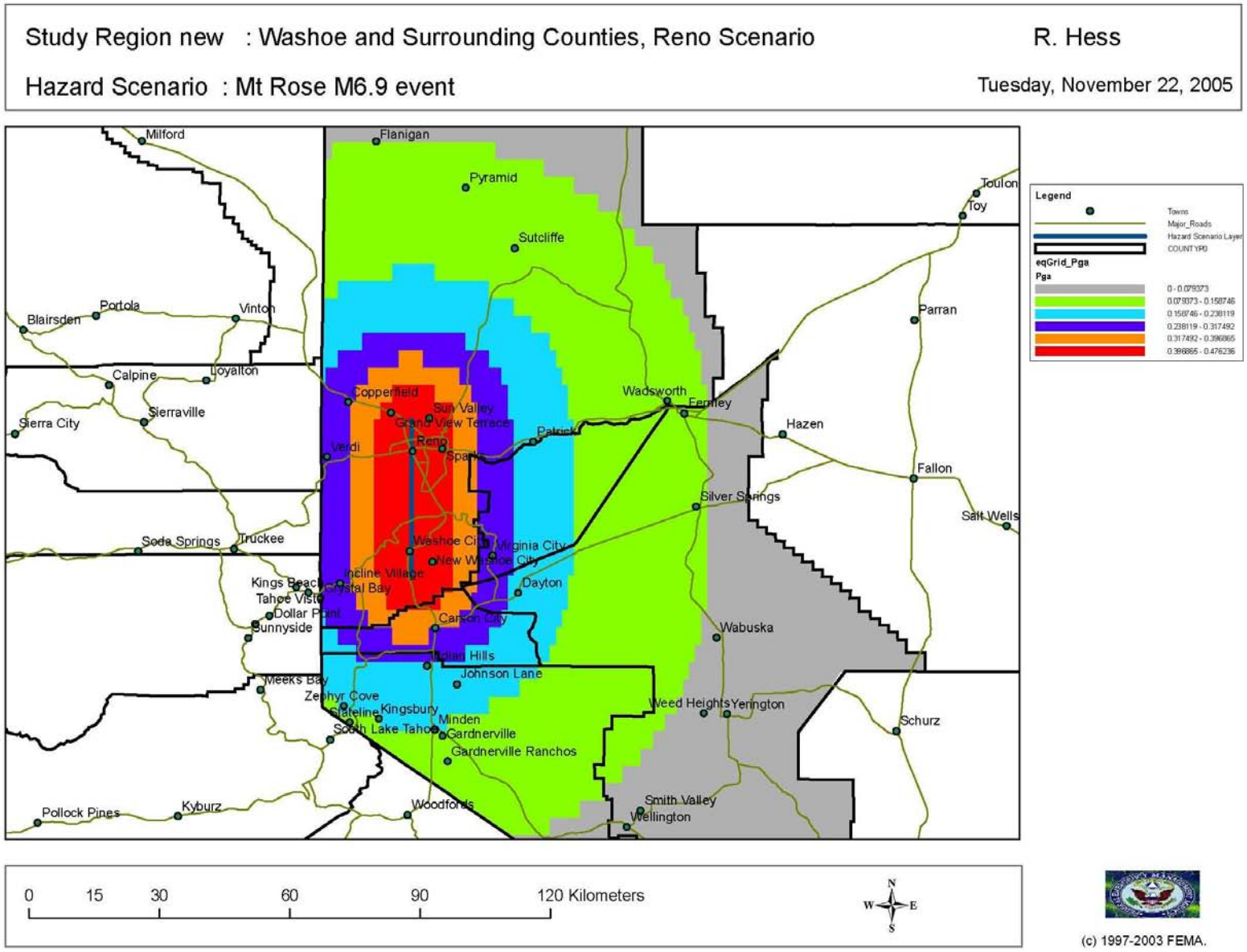
NAC 414.140 Applicant to reimburse Account from certain money received. (NRS 414.135)

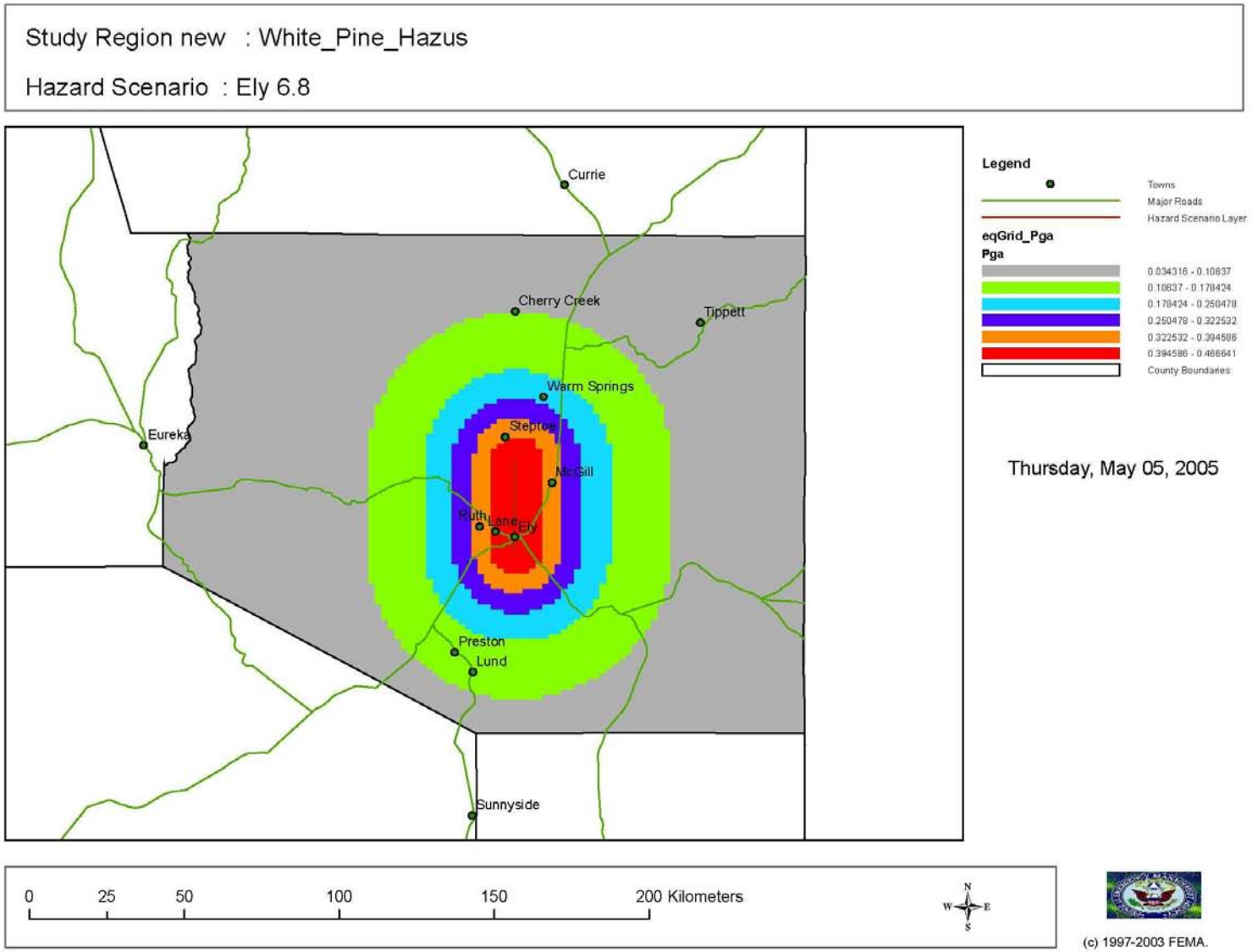
An applicant receiving money from the Emergency Assistance Account shall reimburse the Emergency Assistance Account from any money the applicant receives from:

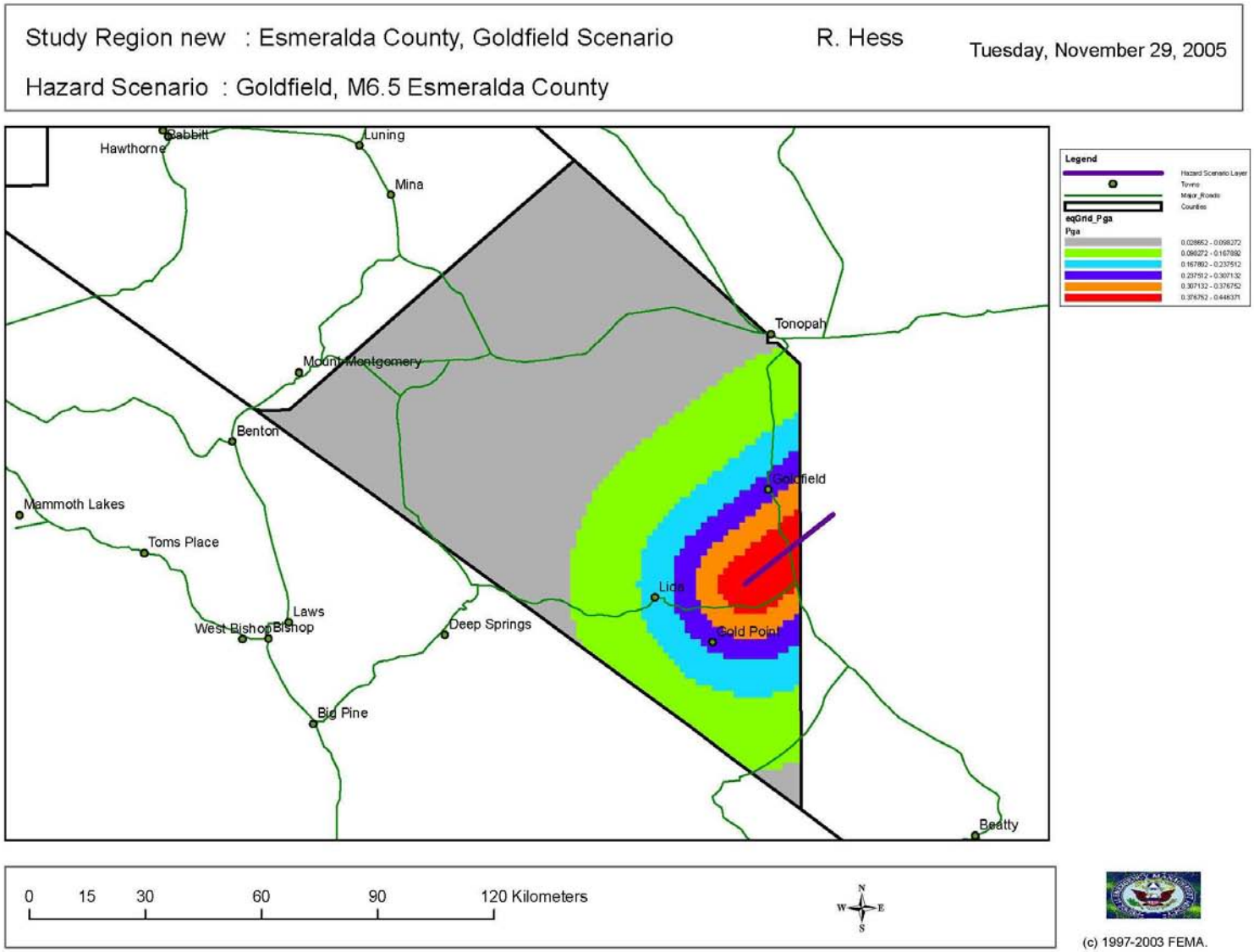
1. Any federal, state or local governmental agency or private source for the emergency or disaster;
2. Legal action taken against any person or entity responsible for the emergency or disaster; or
3. Payments received as a result of coverage from a policy of insurance relating to the emergency or disaster,
4. not later than 30 days after the applicant receives such money.

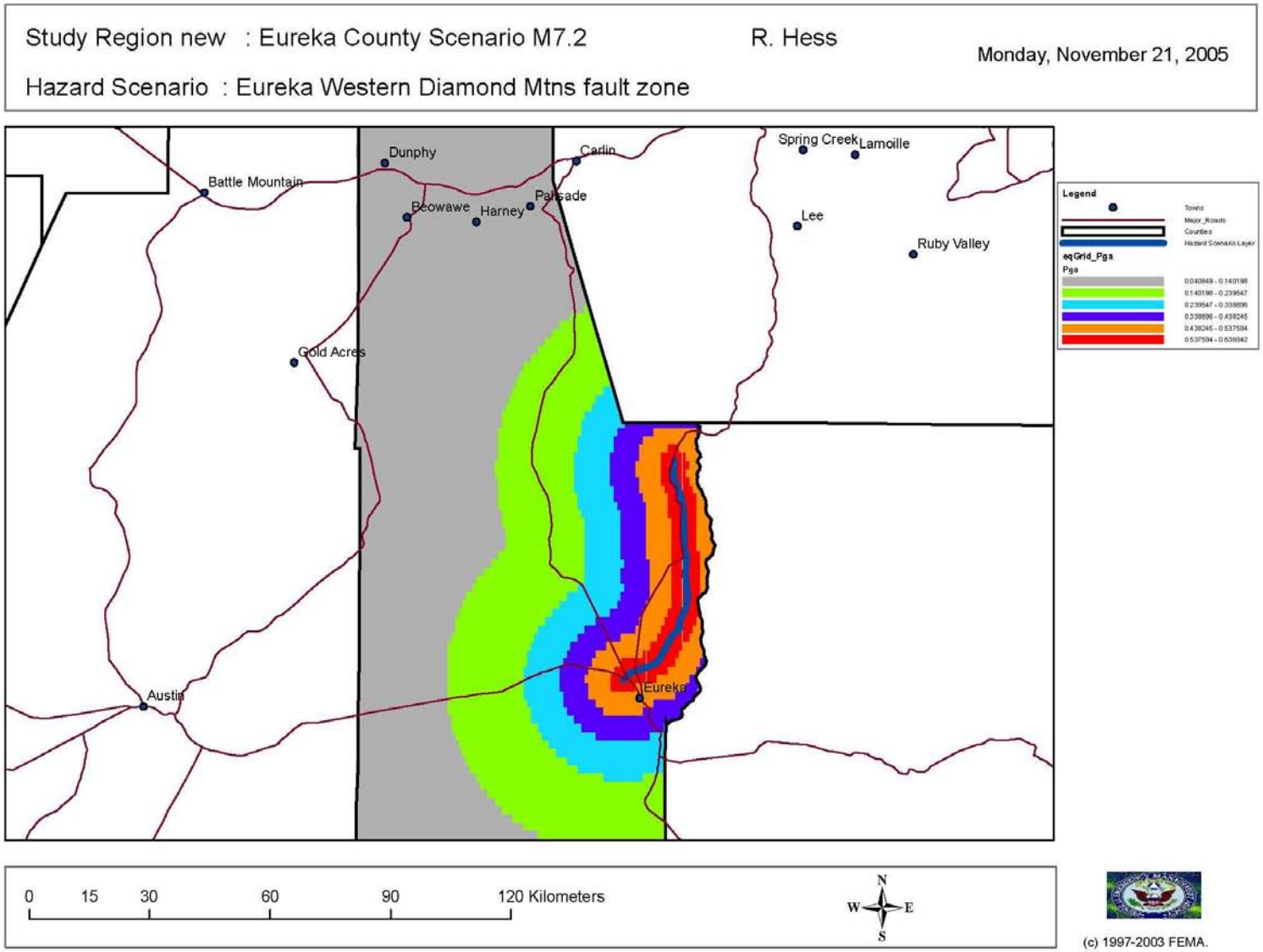
(Added to NAC by Div. of Emergency Mgt. by R202-01, eff. 4-24-2003)

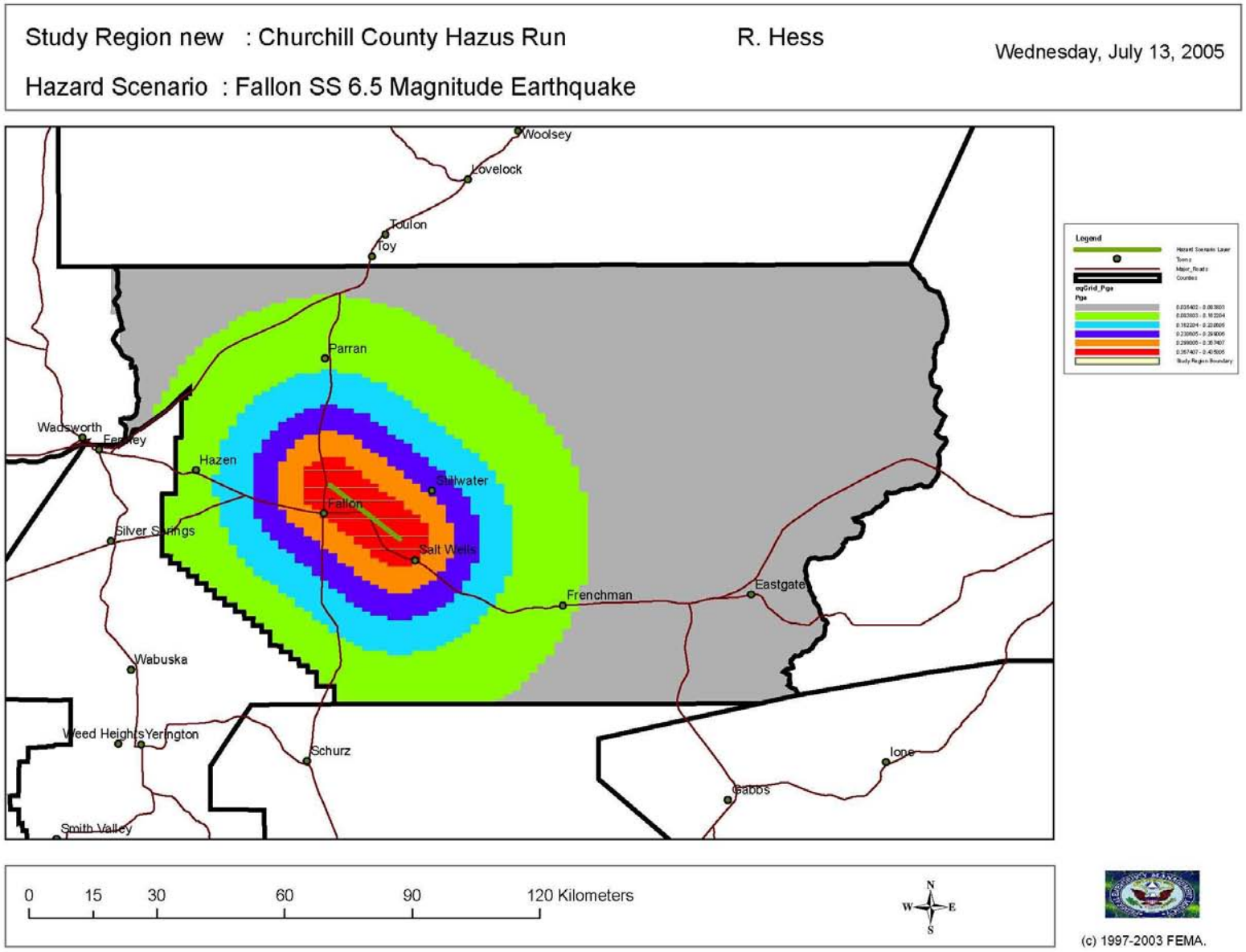

Study Region new : Carson City Hazus Run
R. Hess
Monday, July 25, 2005
Hazard Scenario : Carson City Fault M6.5
Washoe City
New Washoe City
Virginia City
Incline Village
Tahoe Vista
Kings Beach
Crystal Bay
Dayton
Carson City
Indian Hills
Johnson Lane
Zephyr Cove
Kingsbury
Legend
Hazard Scenario Layer
Towns
Major_Roads
County_Boundaries
eqGrid_Pga
Pga
0.180325 - 0.244605
0.244605 - 0.308885
0.308885 - 0.373165
0.373165 - 0.437445
0.437445 - 0.501725
0.501725 - 0.566007
0 5 10 20 30 40 Kilometers
N
W E
S
(c) 1997-2003 FEMA.

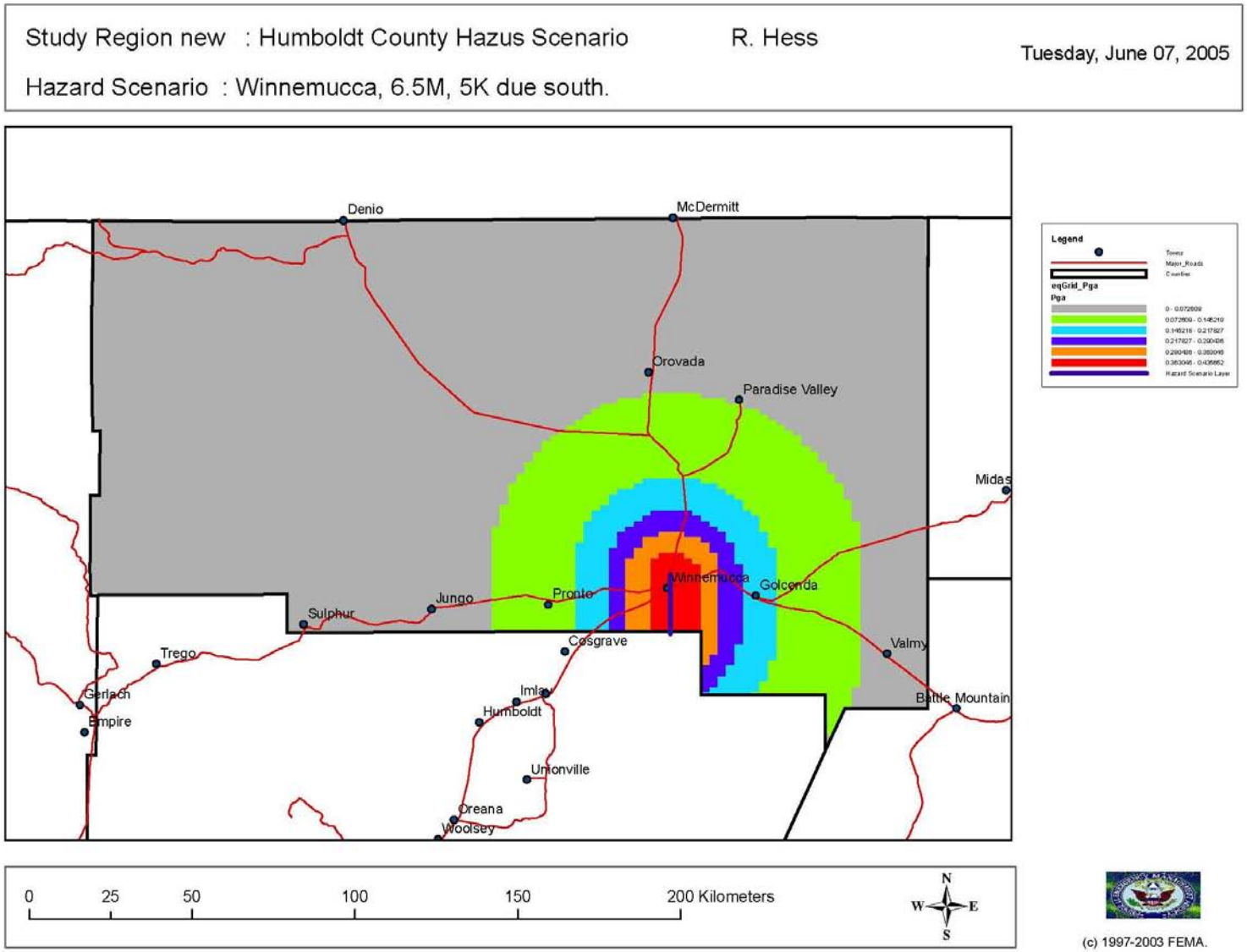

Study Region new : Washoe and Surrounding Counties, Reno Scenario
R. Hess
Hazard Scenario : Mt Rose M6.9 event
Tuesday, November 22, 2005
Milford
Flanigan
Pyramid
Sutcliffe
Toulon
Toy
Parran
Blairsden
Portola
Vinton
Calpine
Loyalton
Sierra City
Sierraville
Copperfield
Sun Valley
Grand View Terrace
Reno
Sparks
Verdi
Patrick
Wadsworth
Fernley
Hazen
Fallon
Silver Springs
Salt Wells
Soda Springs
Truckee
Washoe City
Virginia City
New Washoe City
Incline Village
Crystal Bay
Kings Beach
Tahoe Vista
Dollar Point
Sunnyside
Dayton
Carson City
Wabuska
Indian Hills
Johnson Lane
Meeks Bay
Zephyr Cove
Stateline
Kingsbury
Minden
South Lake Tahoe
Gardnerville
Gardnerville Ranchos
Weed Heights
Yerington
Schurz
Pollock Pines
Kyburz
Woodfords
Smith Valley
Wellington
Legend
Towns
Major_Roads
Hazard Scenario Layer
COUNTYP0
eqGrid_Pga
Pga
0 - 0.079373
0.079373 - 0.158746
0.158746 - 0.238119
0.238119 - 0.317492
0.317492 - 0.396865
0.396865 - 0.476236
0 15 30 60 90 120 Kilometers
N
W E
S
(c) 1997-2003 FEMA.

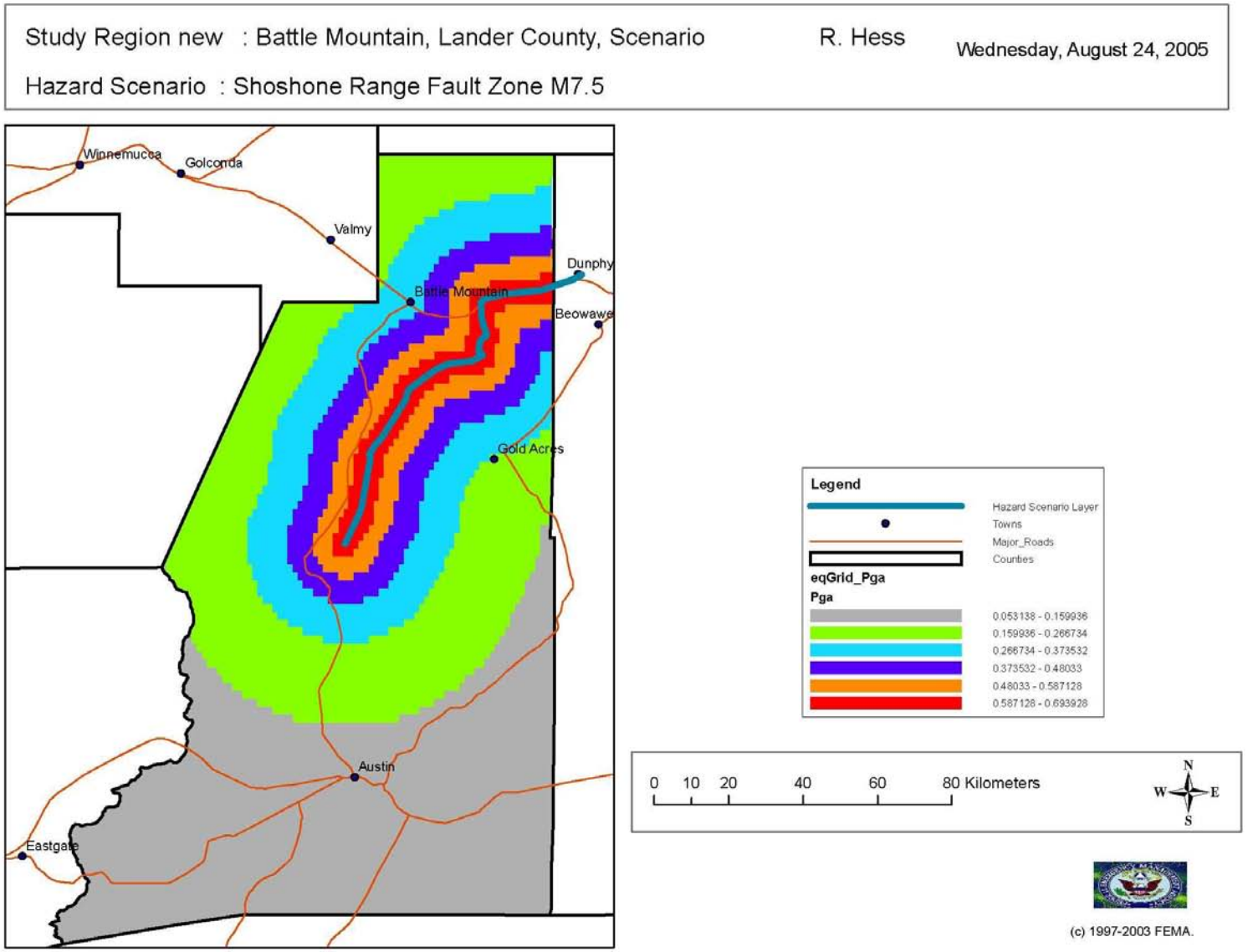

Study Region new : White_Pine_Hazus
Hazard Scenario : Ely 6.8
Currie
Cherry Creek
Tippett
Warm Springs
Eureka
Stephens
McGill
Ruth
Lane
Ely
Preston
Lund
Sunnyside
Legend
Towns
Major Roads
Hazard Scenario Layer
eqGrid_Pga
Pga
0.034316 - 0.10637
0.10637 - 0.178424
0.178424 - 0.250478
0.250478 - 0.322532
0.322532 - 0.394586
0.394586 - 0.466641
County Boundaries
Thursday, May 05, 2005
0 25 50 100 150 200 Kilometers
N
W E
S
(c) 1997-2003 FEMA.


Study Region new : Esmeralda County, Goldfield Scenario
R. Hess
Tuesday, November 29, 2005
Hazard Scenario : Goldfield, M6.5 Esmeralda County
Rabbitt
Hawthorne
Luning
Mina
Tonopah
Mount Montgomery
Benton
Goldfield
Mammoth Lakes
Toms Place
Lida
Laws
West Bishop
Bishop
Deep Springs
Gold Point
Big Pine
Beatty
Legend
Hazard Scenario Layer
Towns
Major_Roads
Counties
eqGrid_Pga
Pga
0.028652 - 0.098272
0.098272 - 0.167892
0.167892 - 0.237512
0.237512 - 0.307132
0.307132 - 0.376752
0.376752 - 0.446371
0 15 30 60 90 120 Kilometers
N
W
E
S
(c) 1997-2003 FEMA.


Study Region new : Eureka County Scenario M7.2
R. Hess
Monday, November 21, 2005
Hazard Scenario : Eureka Western Diamond Mtns fault zone
Dunphy
Carlin
Spring Creek
Lamoille
Battle Mountain
Beowawe
Harney
Palisade
Lee
Ruby Valley
Gold Acres
Austin
Eureka
Legend
eqGrid_Pga
Pga
0 15 30 60 90 120 Kilometers
N
W
E
S
(c) 1997-2003 FEMA.


Study Region new : Churchill County Hazus Run
R. Hess
Wednesday, July 13, 2005
Hazard Scenario : Fallon SS 6.5 Magnitude Earthquake
Woolsey
Lovelock
Toulon
Toy
Parran
Wadsworth
Fernley
Hazen
Shilwater
Fallon
Silver Springs
Salt Wells
Frenchman
Eastgate
Wabuska
Weed Heights
Yerington
Schurz
Gabbs
Ione
Smith Valley
Legend
0 15 30 60 90 120 Kilometers
N
W
E
S
(c) 1997-2003 FEMA.


Study Region new : Humboldt County Hazus Scenario
R. Hess
Tuesday, June 07, 2005
Hazard Scenario : Winnemucca, 6.5M, 5K due south.
Denio
McDermitt
Orovada
Paradise Valley
Midas
Winnemucca
Golconda
Pronto
Jungo
Sulphur
Cosgrave
Valmy
Trego
Gerlach
Empire
Imlay
Humboldt
Battle Mountain
Unionville
Oreana
Woolsey
Legend
0 25 50 100 150 200 Kilometers
N
W E
S
(c) 1997-2003 FEMA.


Study Region new : Battle Mountain, Lander County, Scenario
R. Hess
Wednesday, August 24, 2005
Hazard Scenario : Shoshone Range Fault Zone M7.5
Winnemucca
Golconda
Valmy
Dunphy
Battle Mountain
Beowawe
Gold Acres
Austin
Eastgate
Legend
Hazard Scenario Layer
Towns
Major_Roads
Counties
eqGrid_Pga
Pga
0.053138 - 0.159936
0.159936 - 0.266734
0.266734 - 0.373532
0.373532 - 0.48033
0.48033 - 0.587128
0.587128 - 0.693928
0 10 20 40 60 80 Kilometers
N
W
E
S
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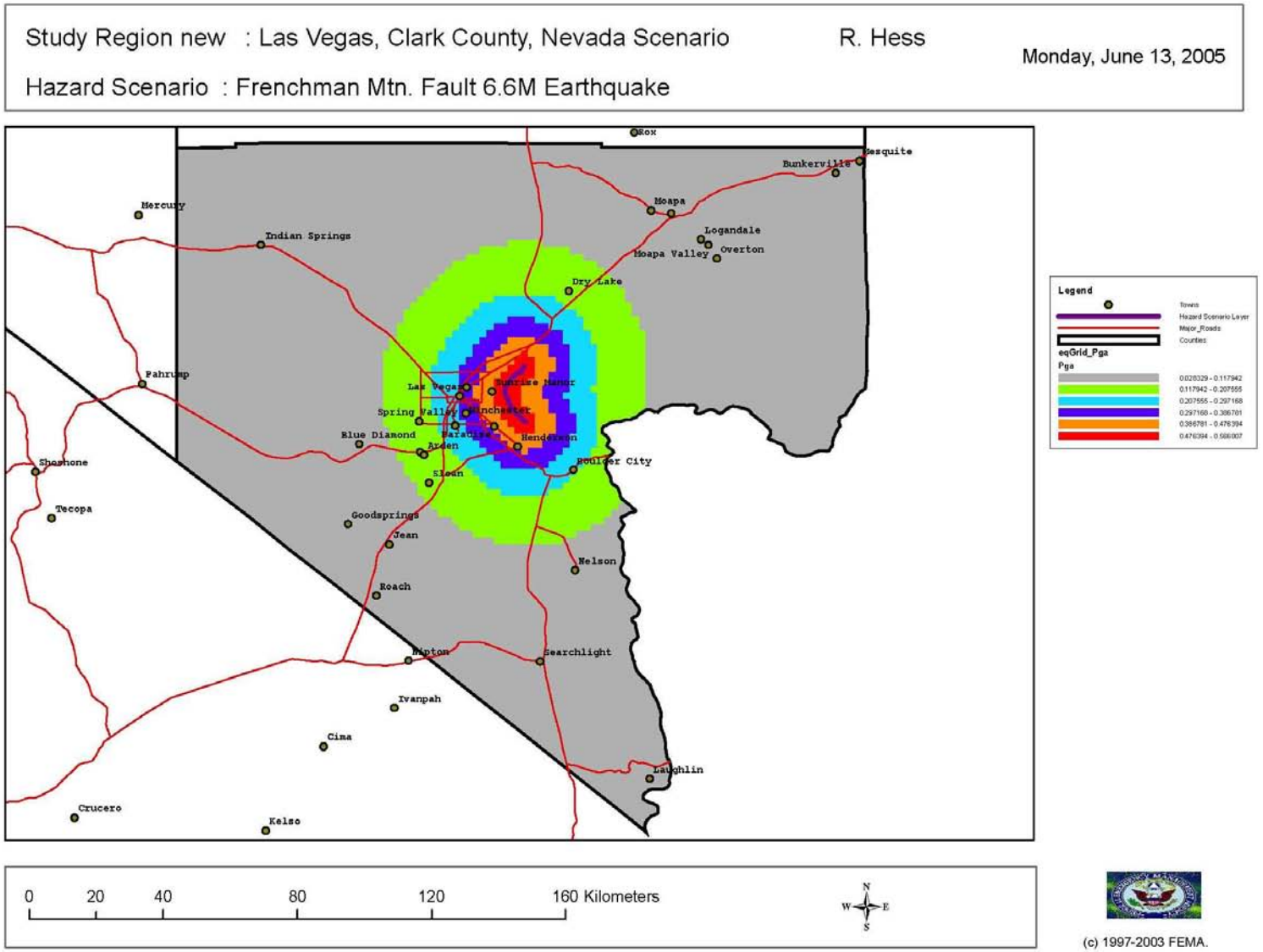
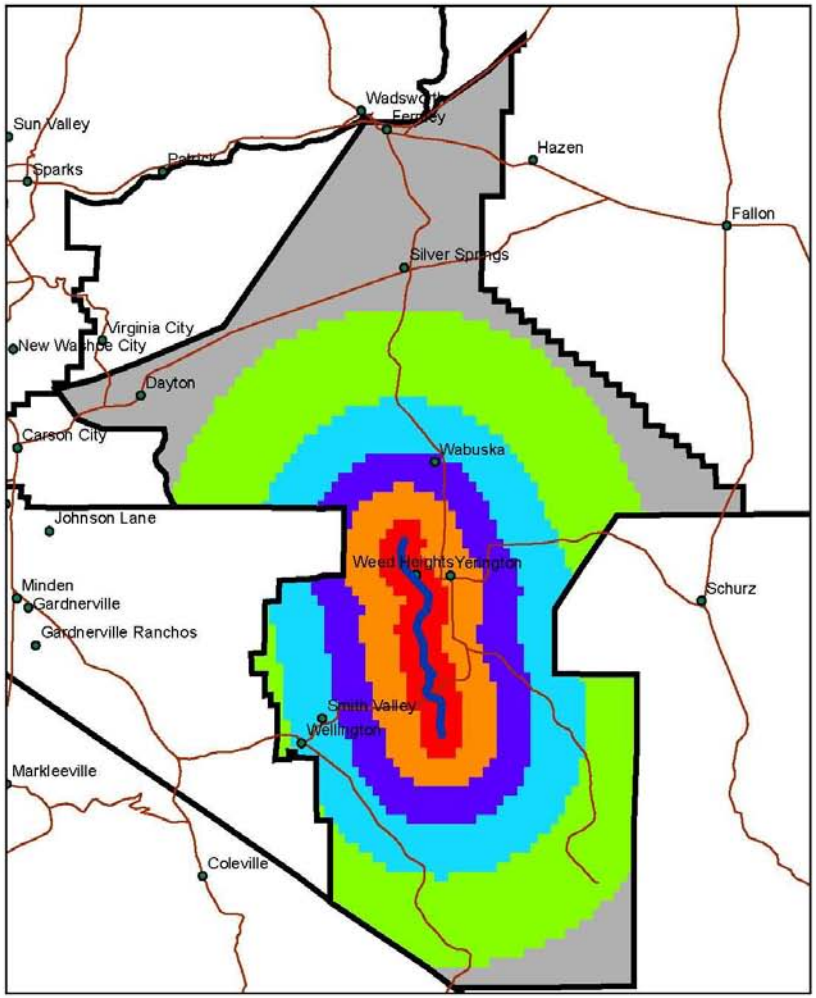
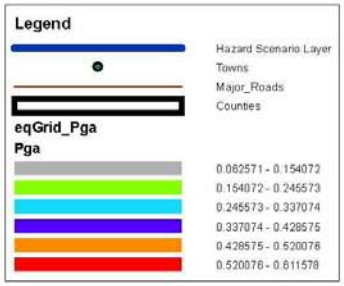
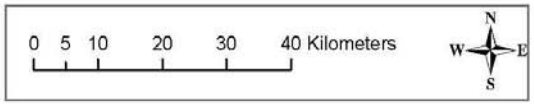

Study Region new : Las Vegas, Clark County, Nevada Scenario
R. Hess
Monday, June 13, 2005
Hazard Scenario : Frenchman Mtn. Fault 6.6M Earthquake
Elox
Bunkerville
Mesquite
Mercury
Indian Springs
Moapa
Logandale
Moapa Valley
Overton
Dry Lake
Pahrump
Las Vegas
Sunrise Manor
Spring Valley
Winchester
Paradise
Blue Diamond
Arden
Henderson
Boulder City
Sloan
Shoshone
Tecopa
Goodsprings
Jean
Nelson
Roach
Nipton
Searchlight
Ivanpah
Cima
Laughlin
Crucero
Kelso
Legend
Towns
Hazard Scenario Layer
Major_Roads
Counties
eqGrid_Pga
Pga
0.028329 - 0.117942
0.117942 - 0.207555
0.207555 - 0.297168
0.297168 - 0.386781
0.386781 - 0.476394
0.476394 - 0.566007
0
20
40
80
120
160 Kilometers
N
W
E
S
(c) 1997-2003 FEMA.

Study Region new : Lyon County Earthquake Scenario R. Hess Thursday, August 11, 2005

Hazard Scenario : Yerington, Singatse Range Fault, M6.9







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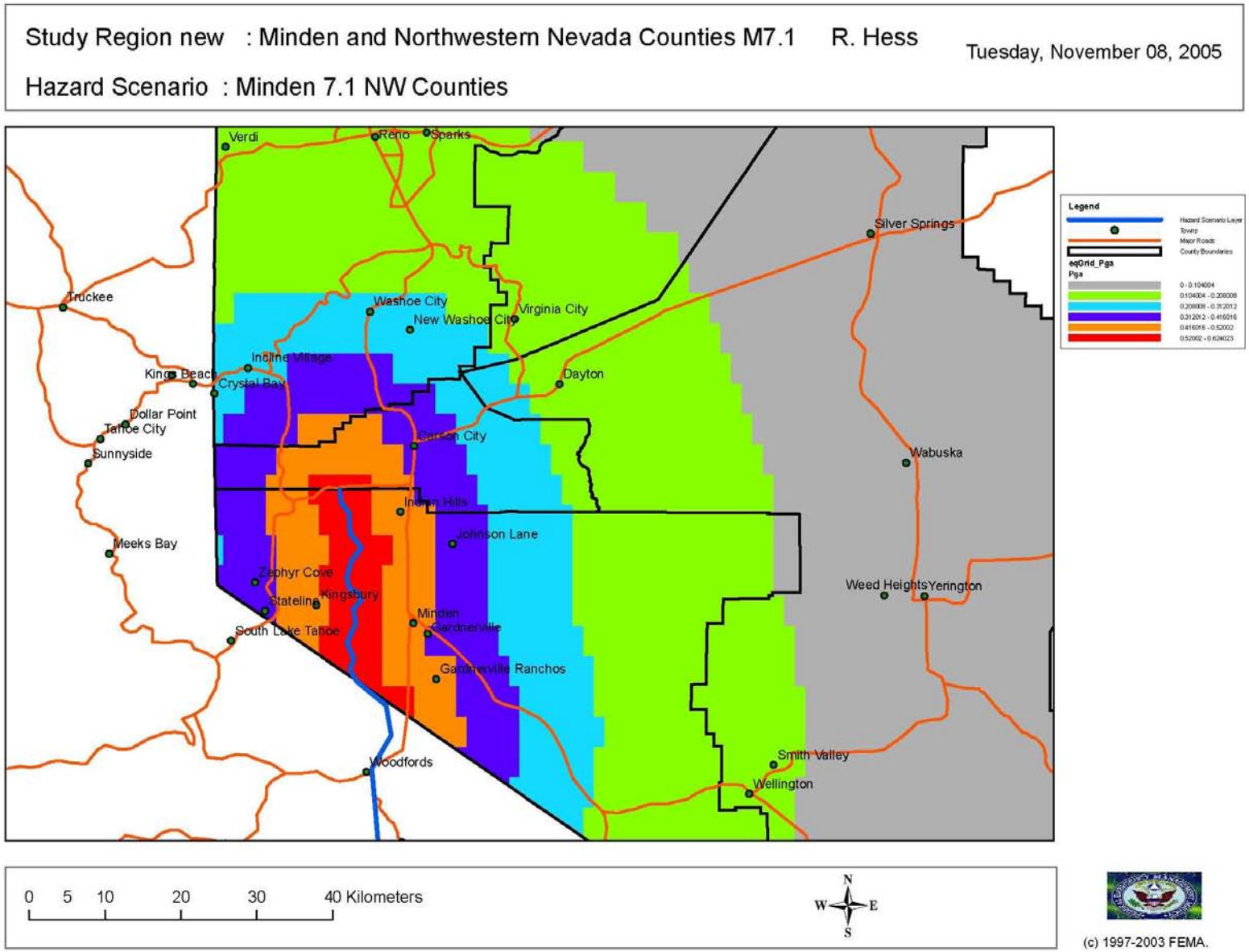
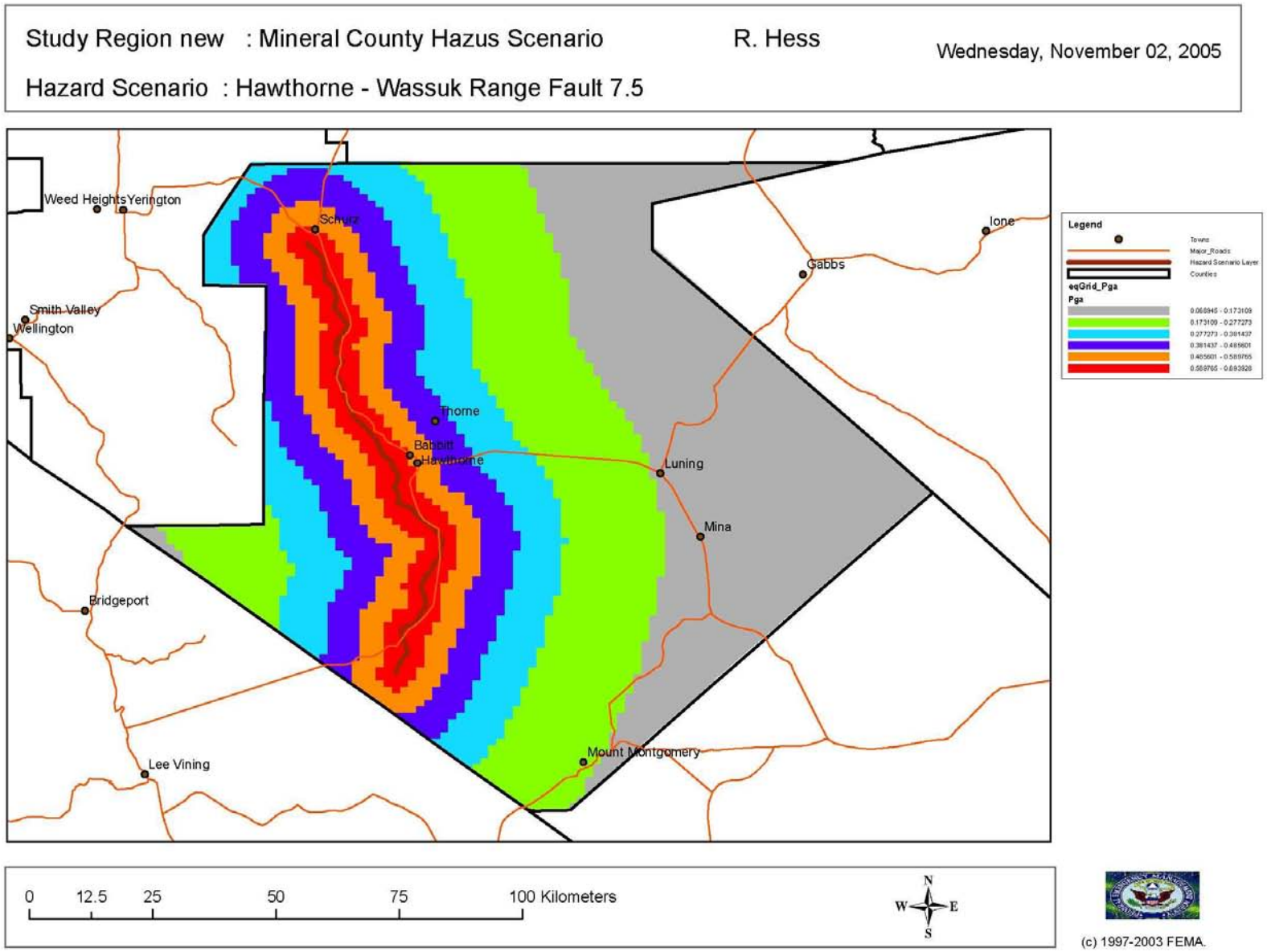
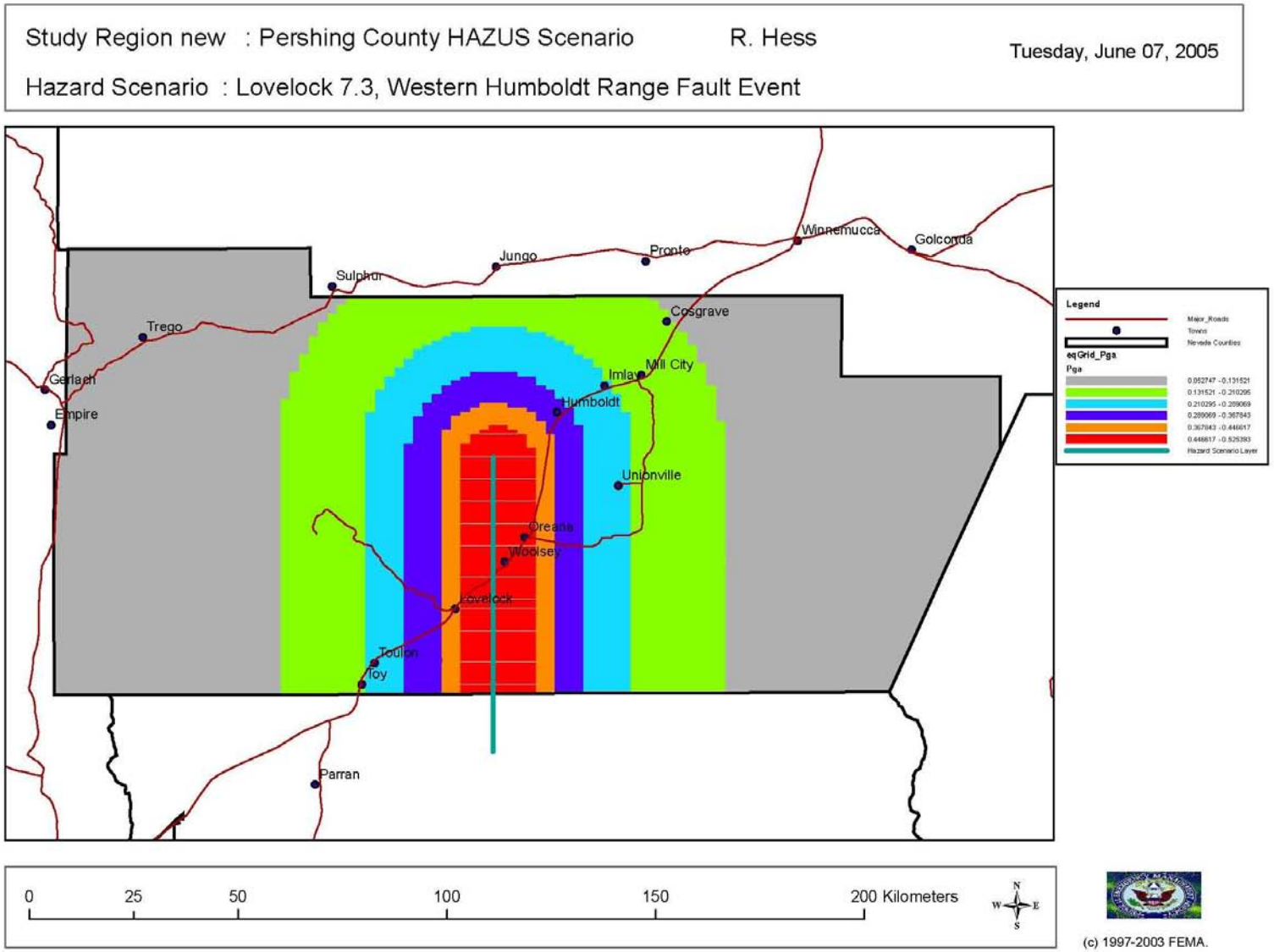
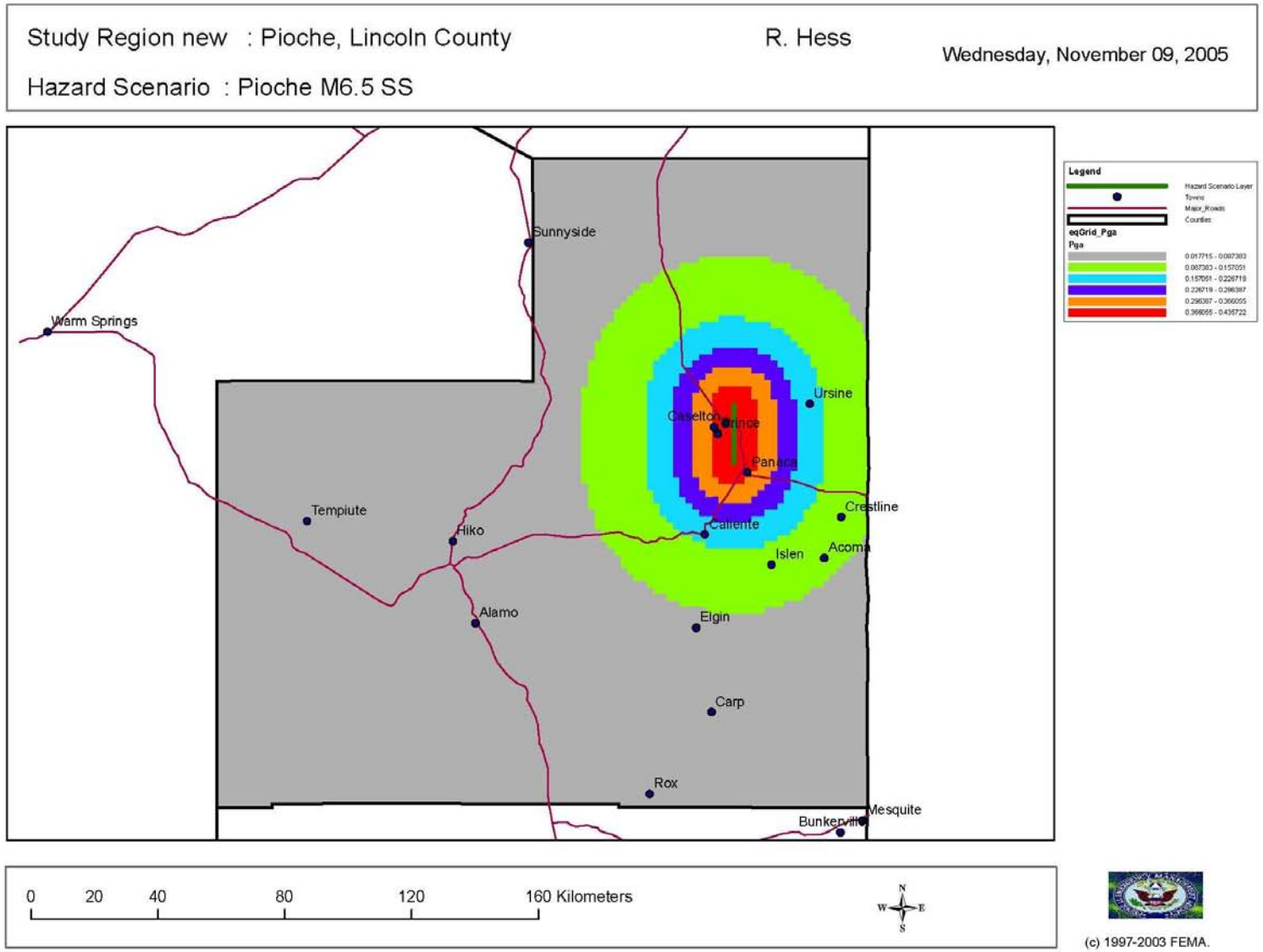
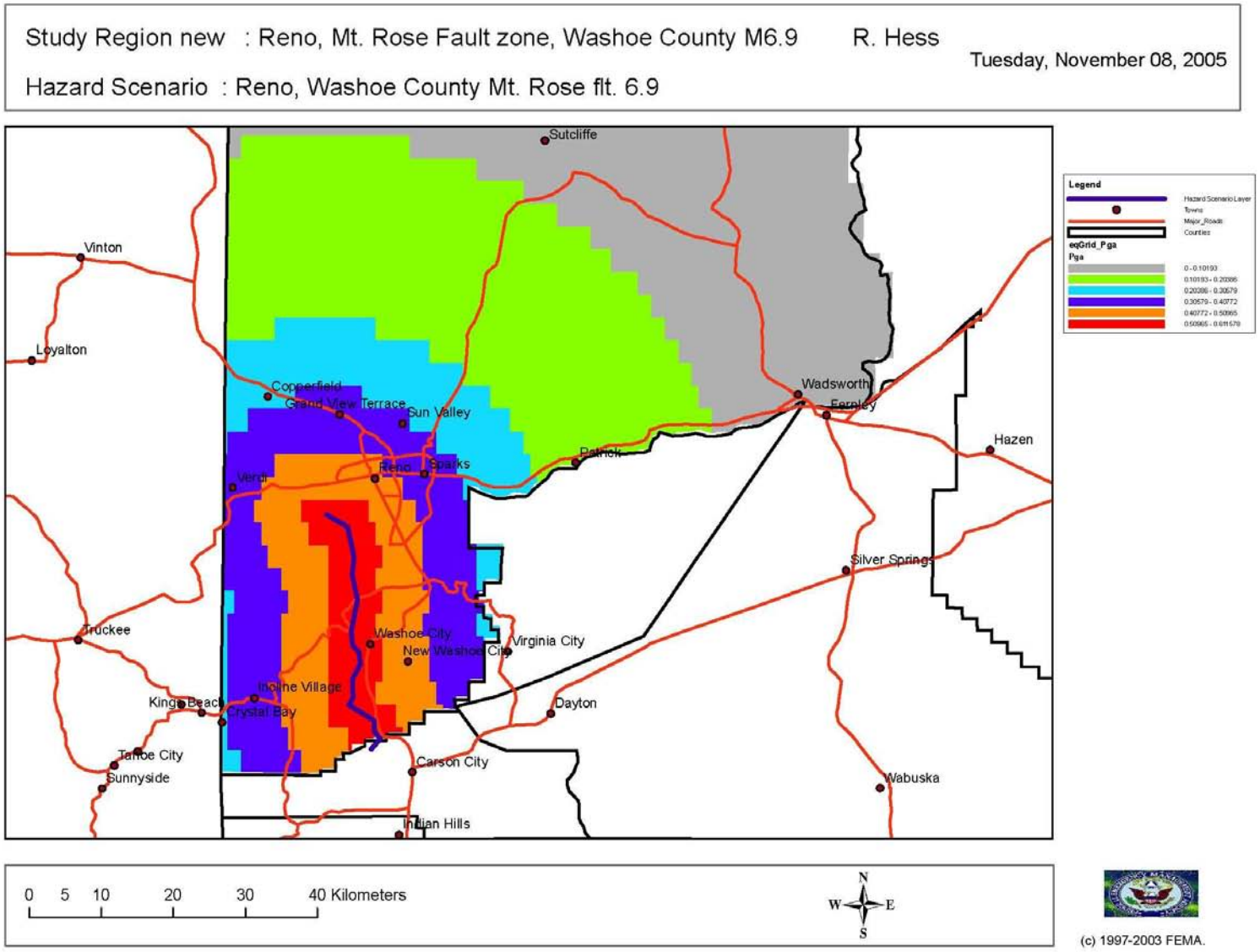
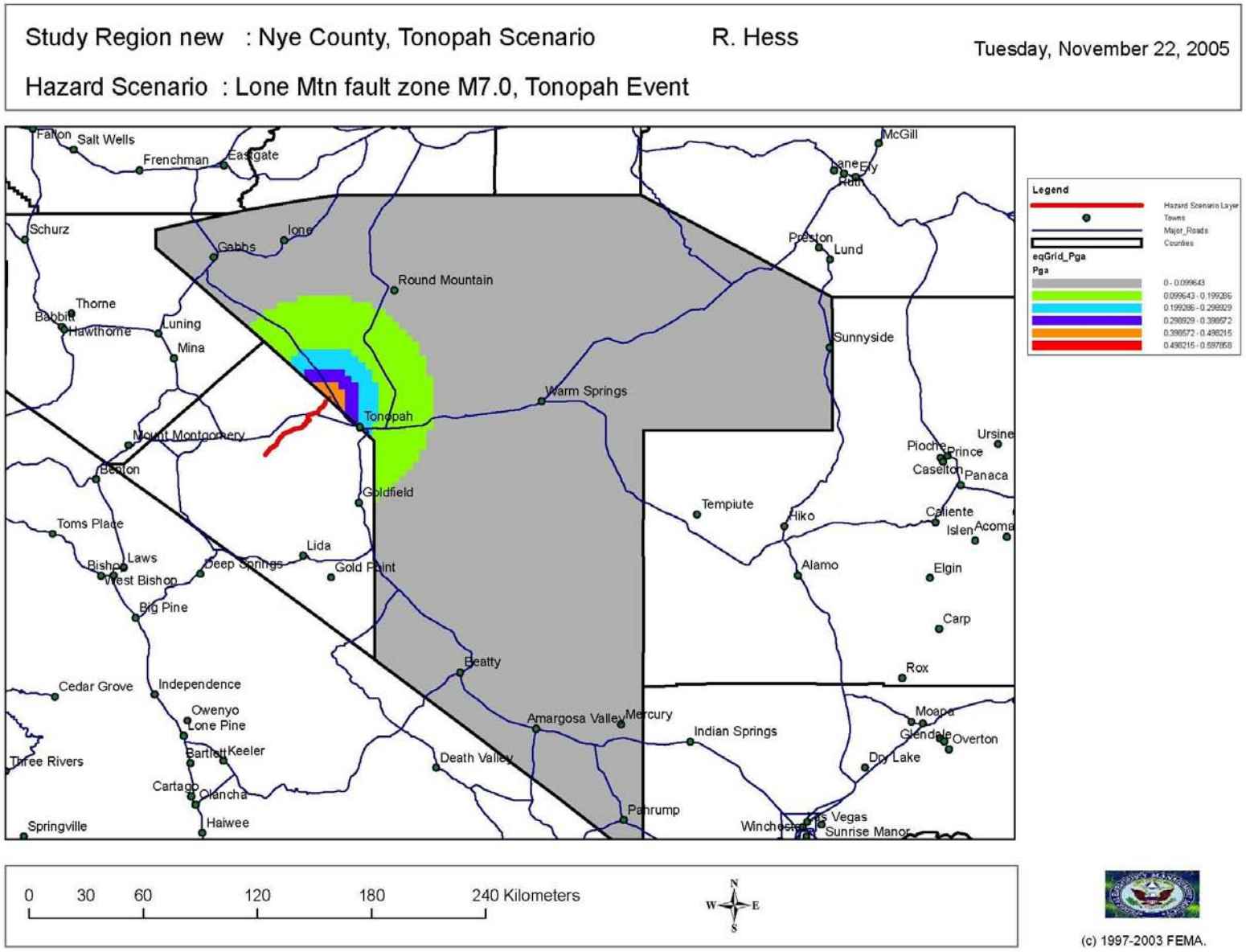

Study Region new : Minden and Northwestern Nevada Counties M7.1
R. Hess
Tuesday, November 08, 2005
Hazard Scenario : Minden 7.1 NW Counties
Verdi
Reno
Sparks
Truckee
Washoe City
New Washoe City
Virginia City
Incline Village
Crystal Bay
Dayton
Silver Springs
Dollar Point
Tahoe City
Sunnyside
Carson City
Wabuska
Indian Hills
Johnson Lane
Meeks Bay
Zephyr Cove
Kingsbury
Stateline
Minden
Gardnerville
South Lake Tahoe
Gardnerville Ranchos
Weed Heights
Yerington
Woodfords
Smith Valley
Wellington
Legend
Hazard Scenario Layer
Towns
Major Roads
County Boundaries
eqGrid_Pga
Pga
0 - 0.104004
0.104004 - 0.208008
0.208008 - 0.312012
0.312012 - 0.416016
0.416016 - 0.52002
0.52002 - 0.624023
0 5 10 20 30 40 Kilometers
N
W
E
S
(c) 1997-2003 FEMA.


Study Region new : Mineral County Hazus Scenario
R. Hess
Wednesday, November 02, 2005
Hazard Scenario : Hawthorne - Wassuk Range Fault 7.5
Weed Heights
Yerington
Schurz
Ione
Gabbs
Smith Valley
Wellington
Thorne
Babbitt
Hawthorne
Luning
Mina
Bridgeport
Lee Vining
Mount Montgomery
Legend
Towns
Major_Roads
Hazard Scenario Layer
Counties
eqGrid_Pga
Pga
0.060945 - 0.173109
0.173109 - 0.277273
0.277273 - 0.381437
0.381437 - 0.485601
0.485601 - 0.589765
0.589765 - 0.693928
0
12.5
25
50
75
100 Kilometers
N
W
E
S
(c) 1997-2003 FEMA.

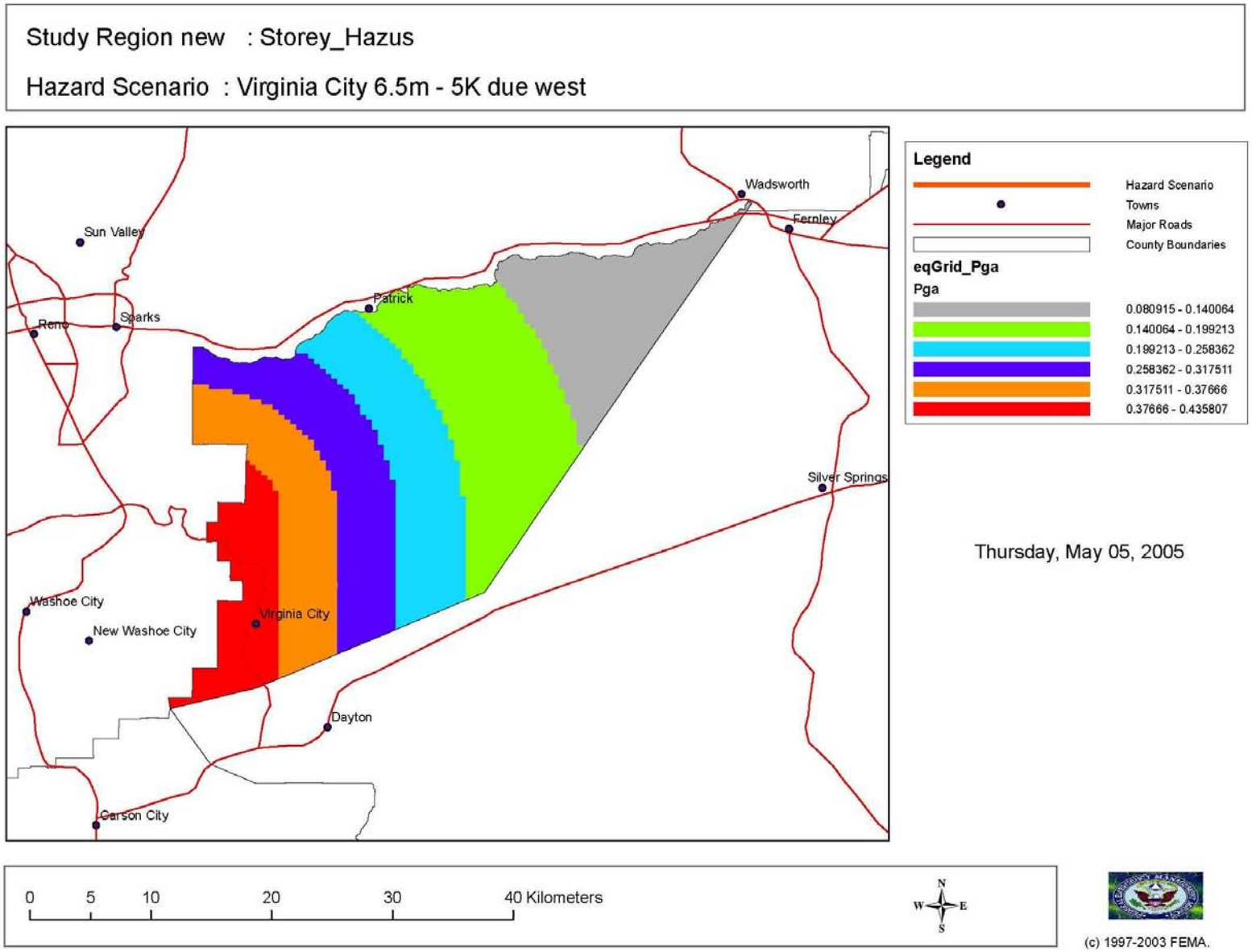

Study Region new : Pershing County HAZUS Scenario R. Hess
Tuesday, June 07, 2005
Hazard Scenario : Lovelock 7.3, Western Humboldt Range Fault Event
Winnemucca
Golconda
Jungo
Pronto
Sulphur
Cosgrave
Trego
Mill City
Imlay
Gerlach
Humboldt
Empire
Unionville
Oreana
Woolsey
Lovelock
Toulon
Toy
Parran
Legend
Major_Roads
Towns
Nevada Counties
eqGrid_Pga
Pga
Hazard Scenario Layer
0 25 50 100 150 200 Kilometers
N
W E
S
(c) 1997-2003 FEMA.


Study Region new : Pioche, Lincoln County
R. Hess
Wednesday, November 09, 2005
Hazard Scenario : Pioche M6.5 SS
Legend
Hazard Scenario Layer
Towns
Major_Roads
Counties
eqGrid_Pga
Pga
0.017715 - 0.067383
0.067383 - 0.157051
0.157051 - 0.226719
0.226719 - 0.296387
0.296387 - 0.366055
0.366055 - 0.435722
Sunnyside
Warm Springs
Ursine
Caselton
Prince
Panaca
Crestline
Tempiute
Hiko
Caliente
Acoma
Islen
Alamo
Elgin
Carp
Rox
Mesquite
Bunkerville
0 20 40 80 120 160 Kilometers
N
W
E
S
(c) 1997-2003 FEMA.


Study Region new : Reno, Mt. Rose Fault zone, Washoe County M6.9
R. Hess
Tuesday, November 08, 2005
Hazard Scenario : Reno, Washoe County Mt. Rose flt. 6.9
Sutcliffe
Vinton
Loyalton
Copperfield
Grand View Terrace
Sun Valley
Wadsworth
Fernley
Hazen
Patrick
Reno
Sparks
Verdi
Silver Springs
Truckee
Washoe City
New Washoe City
Virginia City
Incline Village
Kings Beach
Crystal Bay
Dayton
Tahoe City
Sunnyside
Carson City
Wabuska
Indian Hills
Legend
Hazard Scenario Layer
Towns
Major_Roads
Counties
eqGrid_Pga
Pga
0 - 0.10193
0.10193 - 0.20286
0.20286 - 0.30579
0.30579 - 0.40772
0.40772 - 0.50965
0.50965 - 0.611570
0 5 10 20 30 40 Kilometers
N
W
E
S
(c) 1997-2003 FEMA.



(c) 1997-2003 FEMA.


Study Region new : Storey_Hazus
Hazard Scenario : Virginia City 6.5m - 5K due west
Wadsworth
Fernley
Sun Valley
Patrick
Reno
Sparks
Silver Springs
Washoe City
Virginia City
New Washoe City
Dayton
Carson City
Legend
Hazard Scenario
Towns
Major Roads
County Boundaries
eqGrid_Pga
Pga
0.080915 - 0.140064
0.140064 - 0.199213
0.199213 - 0.258362
0.258362 - 0.317511
0.317511 - 0.37666
0.37666 - 0.435807
Thursday, May 05, 2005
0 5 10 20 30 40 Kilometers
N
W E
S
(c) 1997-2003 FEMA.

APPENDIX G List of Dams by County

Thank you to the Nevada Department of Conservation and Natural Resources, Division of Water Resources for providing the following data.

NAME OF DAM	COUNTY	HAZARD RANKING
CARSON CITY GOLF COURSE DETENTION BASIN	CARSON CITY	S
CARSON CITY SOUTH STORAGE PONDS	CARSON CITY	L
CARSON CITY TREATED EFFLUENT DAM	CARSON CITY	H
CARSON CITY TREATMENT PLANT DRYING BEDS	CARSON CITY	L
SHENANDOAH DETENTION BASIN	CARSON CITY	H
BENCH CREEK DAM	CHURCHILL	L
BRADY DAM	CHURCHILL	L
CARSON RIVER DIVERSION	CHURCHILL	S
CHISHOLM	CHURCHILL	L
DESERT GUN CLUB	CHURCHILL	L
DIXIE COMSTOCK SOLUTION PONDS	CHURCHILL	L
HARMON RESERVOIR	CHURCHILL	L
LAHONTAN	CHURCHILL	H
OLD RIVER DAM	CHURCHILL	L
OLLIE'S POND	CHURCHILL	L
S LINE DAM	CHURCHILL	L
SAGOUSPIE DIVERSION DAM	CHURCHILL	L
SHECKLER DAM	CHURCHILL	S
STILLWATER GEOTHERMAL EVAP POND	CHURCHILL	L
STILLWATER POINT DAM	CHURCHILL	L
AARON WAY DETENTION BASIN	CLARK	H
ABBOTT WASH DETENTION BASIN	CLARK	H
ANDERSON DAIRY WASTE LAGOONS	CLARK	L
ANGEL PARK NORTH DETENTION BASIN	CLARK	H
ANGEL PARK SOUTH DETENTION BASIN	CLARK	H
ANN ROAD DETENTION BASIN	CLARK	H
APEX LANDFILL STORM DAM MA-11	CLARK	L
APEX LANDFILL STORM DAM MA-9	CLARK	L
BELLA FIORE POND #3	CLARK	S
BLACK MOUNTAIN DETENTION BASIN	CLARK	H
BLUE DIAMOND UPPER DETENTION DAM	CLARK	H
BOOTLEG DETENTION BASIN	CLARK	H
BOSTICK WEIR 5.4	CLARK	L
BOULDER WASTEWATER STORAGE DAM	CLARK	L
BOWMAN DAM	CLARK	H
CAREY/LAKE MEAD DETENTION	CLARK	H
CHUCK LENZIE NORTH EVAPORATION POND	CLARK	L
CHUCK LENZIE SOUTH EVAPORATION POND	CLARK	L
CLARK STATION EVAPORATION POND A	CLARK	L

NAME OF DAM	COUNTY	HAZARD RANKING
CLARK STATION EVAPORATION POND B	CLARK	L
CLARK STATION EVAPORATION POND C	CLARK	L
CLARK STATION EVAPORATION POND D	CLARK	L
CLARK STATION EVAPORATION POND E	CLARK	L
CONFLUENCE DETENTION BASIN	CLARK	H
COPPER MOUNTAIN EVAP PONDS	CLARK	L
CORNERSTONE DETENTION DAM	CLARK	H
COYOTE SPRINGS DETENTION BASIN 1	CLARK	H
COYOTE SPRINGS DETENTION BASIN 2	CLARK	H
DESERT INN DETENTION BASIN	CLARK	H
DUCK CREEK INTERIM UPPER DETENTION BASIN	CLARK	H
DUCK CREEK LOWER DETENTION DAM	CLARK	H
DUCK CREEK RAILROAD DETENTION BASIN	CLARK	H
EAST C-1 DETENTION BASIN	CLARK	H
EQUESTRIAN DETENTION BASIN	CLARK	H
F-4 DETENTION BASIN	CLARK	H
FLAMINGO WASH UPPER DETENTION BASIN	CLARK	H
FORT APACHE DETENTION BASIN	CLARK	H
GOWAN DETENTION NORTH	CLARK	H
GOWAN DETENTION SOUTH	CLARK	H
HARRY ALLEN NORTH EVAP POND	CLARK	L
HARRY ALLEN SOUTH EVAP POND	CLARK	L
HEMENWAY VALLEY FLOOD CONTROL DAMS (2)	CLARK	H
HENDERSON WASTEWATER TREATMENT LAGOONS 1 & 2	CLARK	L
HENDERSON WASTEWATER TREATMENT LAGOONS 3	CLARK	L
HIGGINS EVAPORATION POND	CLARK	L
HIKO SPRINGS DETENTION BASIN DAM	CLARK	H
HONEYBEE DAM	CLARK	S
HOOVER	CLARK	H
INDIAN SPRINGS DETENTION BASIN	CLARK	H
KYLE CANYON DETENTION	CLARK	H
KYLE CANYON GATEWAY DETENTION BASIN 1	CLARK	H
KYLE CANYON GATEWAY DETENTION BASIN 2	CLARK	H
KYLE CANYON GATEWAY DETENTION BASIN 3	CLARK	H
LAKE LAS VEGAS	CLARK	S
LAKE LAS VEGAS NORTH SHORE DETENTION BASIN A	CLARK	S
LAS VEGAS WASH LOWER DETENTION BASIN	CLARK	H
LAS VEGAS WASH PEAKING DETENTION BASIN	CLARK	H
LAS VEGAS WASH UPPER DETENTION BASIN	CLARK	H
LEE CANYON RESERVOIR	CLARK	S
LONE MOUNTAIN DETENTION BASIN	CLARK	H

NAME OF DAM	COUNTY	HAZARD RANKING
MCCARRAN AIRFIELD DETENTION DAM	CLARK	H
MCCULLOUGH HILLS PARK DETENTION BASIN	CLARK	H
MEADOWS DETENTION BASIN	CLARK	H
MILL 1 POND A	CLARK	L
MILL 1 POND B	CLARK	L
MILL 2 POND A	CLARK	S
MILL 2 POND B	CLARK	S
MILL 2 POND C	CLARK	S
MILL 2 POND D	CLARK	S
MILL 2 POND E	CLARK	S
MISCELLANEOUS WASTE POND #2	CLARK	L
MISCELLANEOUS WASTE POND #4	CLARK	L
MISSION HILLS DETENTION BASIN	CLARK	H
MOHAVE GEN STA DAM	CLARK	L
MOHAVE GENERATION EVAPORATION POND NO 2	CLARK	H
MOHAVE GENERATION EVAPORATION POND NO 3	CLARK	H
MOHAVE GENERATION EVAPORATION POND NO 4	CLARK	L
MOHAVE GENERATION EVAPORATION POND NO 5	CLARK	L
MOHAVE GENERATION EVAPORATION POND NO 6A	CLARK	L
MOHAVE GENERATION EVAPORATION POND NO 6B	CLARK	L
MOHAVE GENERATION EVAPORATION POND NO 6C	CLARK	L
MONTE CARLO DAM NO 2	CLARK	H
MONTE CARLO DAM NO 3	CLARK	H
NORTH LAS VEGAS DETENTION BASIN	CLARK	H
NORTH RAILROAD DETENTION BASIN	CLARK	H
NORTHEAST C-1 DETENTION BASIN	CLARK	H
OAKEY DETENTION	CLARK	H
PABCO TAILINGS POND 1	CLARK	L
PABCO TAILINGS POND 10	CLARK	L
PABCO TAILINGS POND 11	CLARK	L
PABCO TAILINGS POND 2	CLARK	L
PABCO TAILINGS POND 3	CLARK	L
PABCO TAILINGS POND 4	CLARK	L
PABCO TAILINGS POND 5	CLARK	L
PABCO TAILINGS POND 6	CLARK	L
PABCO TAILINGS POND 7	CLARK	L
PABCO TAILINGS POND 8	CLARK	L
PABCO TAILINGS POND 9	CLARK	L
PHASE I NORTHERN BELTWAY TEMPORARY DETENTION DAM	CLARK	L
PIONEER DETENTION BASIN	CLARK	H
PITTMAN ANTHEM DETENTION BASIN	CLARK	H

NAME OF DAM	COUNTY	HAZARD RANKING
PITTMAN EAST DETENTION BASIN	CLARK	H
PITTMAN PARK DETENTION BASIN	CLARK	H
PULSIPHER WASH DETENTION BASIN	CLARK	H
R-4 DETENTION DAM	CLARK	H
RAINBOW DETENTION BASIN	CLARK	S
RANCHO DETENTION BASIN	CLARK	H
RED ROCK DETENTION	CLARK	H
RGS BLOWDOWN POND	CLARK	H
RGS MESA DREDGE POND	CLARK	L
RGS MESA PONDS	CLARK	L
RGS POND A	CLARK	S
RGS POND B1	CLARK	S
RGS POND B2	CLARK	S
RGS POND B3	CLARK	S
RGS POND C1	CLARK	S
RGS POND C2	CLARK	S
RGS POND D	CLARK	S
RGS POND E1	CLARK	S
RGS POND E2	CLARK	S
RGS POND F	CLARK	S
RGS POND G	CLARK	S
RGS RAW WATER PONDS	CLARK	S
RIVER MOUNTAINS IMPOUNDMENT DAM	CLARK	H
RUSSELL ROAD TEMPORARY DETENTION BASIN	CLARK	S
SIMPLOT TAILINGS	CLARK	L
SOUTH EDGE EAST 1 HEADWORKS DETENTION BASIN	CLARK	H
SPENT CAUSTIC LIQUOR POND	CLARK	L
SPENT LEACHING LIQUOR POND #3	CLARK	L
SPENT LEACHING LIQUOR POND #4	CLARK	L
SPRING MOUNTAIN RANCH	CLARK	S
SUMMERLIN DETENTION BASIN #5	CLARK	H
SUMMERLIN TEMPORARY DETENTION BASIN	CLARK	H
THE LAKES DETENTION BASIN	CLARK	L
TOWN WASH DAM	CLARK	H
TROPICANA NORTH BRANCH DETENTION BASIN	CLARK	H
TROPICANA WASH DETENTION BASIN	CLARK	H
VAN BUSKIRK CHANNEL DETENTION BASIN - SITE A	CLARK	L
VANDENBERG DETENTION BASIN	CLARK	H
WEISKOPF GOLF COURSE BLM HOLE #3 DAM	CLARK	S
WEST RANGE WASH DIVERSION DIKE	CLARK	S
WHITE NARROWS DETENTION DAM	CLARK	L

NAME OF DAM	COUNTY	HAZARD RANKING
WINDMILL WASH DETENTION BASIN	CLARK	H
ALLERMAN #1 DAM	DOUGLAS	H
ALLERMAN #2 DAM	DOUGLAS	H
ALLERMAN #4 DAM	DOUGLAS	L
AMBROSETTI POND	DOUGLAS	L
BENTLY RESERVOIR	DOUGLAS	H
BODIE DAM	DOUGLAS	H
BOURNE RESERVOIR DAM	DOUGLAS	H
BUCKEYE CREEK LOWER EFFLUENT STORAGE POND	DOUGLAS	H
BUCKEYE CREEK MIDDLE EFFLUENT STORAGE POND	DOUGLAS	H
BUCKEYE CREEK UPPER EFFLUENT STORAGE POND	DOUGLAS	H
BUCKSKIN TAILINGS	DOUGLAS	L
EAST PEAK LAKE	DOUGLAS	H
FRIDAYS STATION DAM	DOUGLAS	S
INDIAN HILLS EFFLUENT POND #5	DOUGLAS	S
INDIAN HILLS EFFLUENT POND #6	DOUGLAS	S
LIPPINCOTT SKI DAM	DOUGLAS	L
LIPPINCOTT SKI DAM II	DOUGLAS	L
LOGAN CREEK	DOUGLAS	H
MID-VALLEY W. W. T. P.	DOUGLAS	L
MINDEN-GARDNERVILLE SANITATION DISTRICT	DOUGLAS	S
MUD LAKE	DOUGLAS	H
NORTH CARSON VALLEY TREATED EFFLUENT STORAGE DAM	DOUGLAS	S
O'BANION DAM	DOUGLAS	L
ROUNDHILL EFFLUENT	DOUGLAS	H
SIERRA SPRINGS	DOUGLAS	S
SONORA BUCKSKIN TAILS	DOUGLAS	L
SPOONER LAKE DAM	DOUGLAS	S
TOPAZ LAKE	DOUGLAS	H
VETA GRANDE TAILS DAM	DOUGLAS	H
WETLANDS ENHANCEMENT CELL 1 2	DOUGLAS	L
WETLANDS ENHANCEMENT CELL 2	DOUGLAS	L
WETLANDS ENHANCEMENT CELL 3 4 5	DOUGLAS	L
WETLANDS ENHANCEMENT CELL 6	DOUGLAS	L
WETLANDS ENHANCEMENT CELL 7	DOUGLAS	L
WETLANDS ENHANCEMENT CELL 8	DOUGLAS	L
WETLANDS ENHANCEMENT EXISTING	DOUGLAS	L
ANGEL LAKE DAM	ELKO	S
BIG SPRINGS TAILINGS DAM	ELKO	S
BILLY SHAW DAM	ELKO	L
BISHOP CREEK DAM	ELKO	H

NAME OF DAM	COUNTY	HAZARD RANKING
BOIES RESERVOIR	ELKO	L
BOYD RESERVOIR	ELKO	L
BULL RUN DAM	ELKO	L
BURNS CREEK LOWER SILTATION DAM	ELKO	L
BURNS CREEK UPPER SILTATION DAM	ELKO	L
CARLIN WW EAST RIB	ELKO	L
CARLIN WW STORAGE POND	ELKO	L
CARLIN WW WEST RIB	ELKO	L
CARLIN WWTP TREATMENT LAGOON CELL 1	ELKO	L
CARLIN WWTP TREATMENT LAGOON CELL2	ELKO	L
CHARLESTON RESERVOIR	ELKO	L
CHIMNEY CREEK DAM	ELKO	L
CIRCLE DAM	ELKO	L
COYOTE HOLE DAM	ELKO	L
CRITTENDEN DAM	ELKO	L
DAKE RESERVOIR	ELKO	S
DAM CHESTER DAM	ELKO	H
DEE GOLD FRESH WATER DAM	ELKO	S
DEE GOLD SOLUTION PONDS	ELKO	L
DEE GOLD TAILS #1	ELKO	L
DEE GOLD TAILS #2	ELKO	L
DEE GOLD WEST BASIN LEACH PONDS	ELKO	S
DEEP CREEK DAM	ELKO	L
DINNER STATION DAM	ELKO	S
DORSEY CREEK DAM	ELKO	L
DRY CREEK DAM	ELKO	L
EGBERT DAM	ELKO	L
EIGHT MILE CREEK DAM	ELKO	H
ELKO EFFLUENT NORTH STORAGE POND	ELKO	H
ELKO EFFLUENT SOUTH STORAGE POND	ELKO	H
ELKO EMERGENCY EFFLUENT STORAGE	ELKO	L
ELKO INTERCEPT POND 4B	ELKO	L
ELKO NORTH WASTE WATER PONDS	ELKO	L
ELKO PERCOLATION POND 1A	ELKO	L
ELKO PERCOLATION POND 1B	ELKO	L
ELKO PERCOLATION POND 2A	ELKO	L
ELKO PERCOLATION POND 2B	ELKO	L
ELKO PERCOLATION POND 3A	ELKO	L
ELKO PERCOLATION POND 3B	ELKO	L
ELKO PERCOLATION POND 5A	ELKO	L
ELKO PERCOLATION POND 5B	ELKO	L

NAME OF DAM	COUNTY	HAZARD RANKING
ELKO SOUTH WASTE WATER POND	ELKO	L
EMIGRANT PROCESS PONDS DAM	ELKO	L
FIFTH STREET WASH DAM	ELKO	H
GIBBS RANCH DAM	ELKO	S
GROUNDHOG RES	ELKO	L
HAYSTACK POND #1	ELKO	S
HEADGATE DAM	ELKO	L
HOT CREEK DAM	ELKO	S
INDEPENDENCE COOLING POND	ELKO	L
INDEPENDENCE MILL CREEK SEDIMENT DAM	ELKO	L
INDEPENDENCE NORTH DRAINAGE RETENTION DAM	ELKO	L
INDEPENDENCE OVERFLOW CATCHMENT DAM	ELKO	L
INDEPENDENCE SOUTH DRAINAGE RETENTION DAM	ELKO	L
JACKPOT LAGOON 1	ELKO	L
JACKPOT LAGOON 2	ELKO	L
JACKPOT LAGOON 3	ELKO	L
JACKPOT LAGOON 4	ELKO	L
JACKPOT LAGOON 5	ELKO	L
JACKPOT LAGOON 6	ELKO	L
JAYNES RESERVOIR	ELKO	L
JERRITT CANYON EVAPORATION POND	ELKO	L
JERRITT CANYON TAILINGS DAM	ELKO	S
JOHN DAY RESERVOIR	ELKO	L
JOSEPHINE RES	ELKO	L
LAMOILLE ROAD DETENTION DAM	ELKO	H
MAGGIE CREEK DAM	ELKO	H
MILL #3 LEACHATE PONDS	ELKO	L
MILL #3 TAILINGS DAM	ELKO	S
MILL CREEK DAM	ELKO	S
MILL CREEK SLUDGE	ELKO	S
MOUNTAIN CITY MILL NORTH POND	ELKO	L
MOUNTAIN CITY MILL WEST POND	ELKO	L
NEWMONT MIDAS TAILINGS STORAGE FACILITY PH IV	ELKO	S
NEWMONT MIDAS TAILINGS STORAGE FACILITY PH V	ELKO	S
NV NO NAME 1	ELKO	L
NV NO NAME 2	ELKO	L
NV NO NAME 3	ELKO	L
NV NO NAME 4	ELKO	L
PX RANCH RESERVOIR	ELKO	L
RAWHIDE DAM	ELKO	L
REED RESERVOIR DAM	ELKO	L

NAME OF DAM	COUNTY	HAZARD RANKING
RIO TINTO	ELKO	L
ROUND MOUNTAIN RESERVOIR	ELKO	L
RUBY LAKE EAST SUMP CROSS DIKE	ELKO	L
SALMON FALLS FISH	ELKO	L
SAMMY CREEK SEDIMENT CONTROL DAM	ELKO	L
SAVAL RESERVOIR DAM	ELKO	L
SHEEP CREEK DAM	ELKO	L
SOUTH FORK	ELKO	H
SOUTH SIDE WASH	ELKO	H
SPENCER DAM	ELKO	L
SPRING CREEK DAM #1	ELKO	H
SPRING DAM	ELKO	S
SUNFLOWER RESERVOIR	ELKO	S
TRANSCON TAILINGS	ELKO	L
TWENTY-THREE MILE DAM	ELKO	L
VICTORIA MINE #2	ELKO	S
VICTORIA TAILINGS	ELKO	S
WATER CANYON SEDIMENT CONTROL DAM	ELKO	L
WELCOME DAM	ELKO	L
WELLS WASTEWATER	ELKO	L
WILD HORSE DAM	ELKO	H
WILLOW CREEK DAM	ELKO	L
WILSON RESERVOIR	ELKO	L
WINTERS CREEK SILTATION DAM	ELKO	L
WOOD GULCH TAILS POND	ELKO	L
ZUNINO RESERVOIR	ELKO	S
B AND B MINE DAM	ESMERALDA	L
CHIATOVICH CREEK DAM	ESMERALDA	L
FISH LAKE DAM	ESMERALDA	S
MCAFEE CREEK DAM	ESMERALDA	L
SILVER PEAK 16 TO 1 TAILS #2	ESMERALDA	L
SILVER PEAK 16 TO 1 TAILS DAM	ESMERALDA	L
A-A OVERFLOW POND	EUREKA	S
A-A TAILS DAM	EUREKA	S
BARRICK ROASTER POND	EUREKA	S
BOULDER RESERVOIR DAM SOUTH	EUREKA	L
BULLION MONARCH TAILINGS RETENTION DAM	EUREKA	L
CARLIN GOLD STORMWATER DAM	EUREKA	S
CARLIN GOLD TAILINGS DAM	EUREKA	S
EISENMAN TAILS #1	EUREKA	L
EISENMAN TAILS #2	EUREKA	L

NAME OF DAM	COUNTY	HAZARD RANKING
EUREKA SEWAGE TREATMENT POND #1	EUREKA	L
EUREKA SEWAGE TREATMENT POND #2	EUREKA	L
EUREKA SEWAGE TREATMENT POND #5	EUREKA	L
EUREKA SEWAGE TREATMENT POND #6	EUREKA	L
GOLD BAR TAILINGS DAM CELL #1	EUREKA	L
GOLD BAR TAILINGS DAM CELL #2	EUREKA	L
GOLD BAR TAILINGS DAM CELL #3	EUREKA	L
GOLD QUARRY WATER TREATMENT PONDS	EUREKA	L
JAMES CREEK DIVERSION DAM	EUREKA	H
JAMES CREEK TAILINGS DAM	EUREKA	S
JD RESERVOIR	EUREKA	L
MILL #4 TAILINGS DAM #1	EUREKA	S
MILL #4 TAILINGS DAM #2	EUREKA	S
MILL #5/#6 TAILINGS DAM	EUREKA	S
MILL #5/#6 WEST TAILS STORAGE FACILITY	EUREKA	L
MOUNT HOPE SOUTH TAILINGS STORAGE FACILITY	EUREKA	L
NEWMONT NORTH AREA LEACHATE PONDS	EUREKA	L
NEWMONT REFRACTORY ATS STORAGE POND	EUREKA	L
NEWMONT REFRACTORY BIO SOLUTION POND	EUREKA	L
NEWMONT REFRACTORY BIO STORMWATER POND	EUREKA	L
NEWMONT SOUTH AREA SOLUTION POND	EUREKA	L
NORTH AREA LEACH STORMWATER POND	EUREKA	S
NORTH AREA LEACHATE POND ADDITION	EUREKA	L
NORTH BLOCK TAILINGS IMPOUNDMENT	EUREKA	S
PALISADES 1	EUREKA	L
PALISADES 2	EUREKA	L
PALISADES 3	EUREKA	L
PALISADES 4	EUREKA	L
PALISADES 5	EUREKA	L
PALISADES 6	EUREKA	L
PETE WASTE ROCK DISPOSAL OVERFLOW POND	EUREKA	L
ROBERTS CREEK DAM	EUREKA	L
RODEO CREEK DIVERSION DAM	EUREKA	S
ROTP SPILL HOLDING POND	EUREKA	S
ROTP STORMWATER HOLDING POND	EUREKA	L
SAND DUNE EMBANKMENT - CENTER	EUREKA	L
SAND DUNE EMBANKMENT - NORTH	EUREKA	L
SAND DUNE EMBANKMENT - SOUTH	EUREKA	L
SOUTH LEACH NON-PROPERTY PONDS	EUREKA	L
SOUTH LEACH NON-PROPERTY PONDS #2	EUREKA	L
SOUTH LEACH PROPERTY PONDS	EUREKA	L

NAME OF DAM	COUNTY	HAZARD RANKING
SOUTH LEACH PROPERTY STORMWATER POND	EUREKA	L
TONKIN RESERVOIR DAM	EUREKA	S
TONKIN SPRINGS TAILINGS	EUREKA	L
T-S RANCH DAM	EUREKA	S
TS RANCH POWER PLANT EVAP PONDS	EUREKA	L
WHITE LINED PONDS	EUREKA	L
ALDER CREEK RANCH DAM	HUMBOLDT	L
ALKALI RESERVOIR	HUMBOLDT	S
BIG SPRING RESERVIOR	HUMBOLDT	L
BILK CREEK RESERVOIR	HUMBOLDT	L
BOG HOT RESERVOIR	HUMBOLDT	S
CHIMNEY DAM	HUMBOLDT	S
CROFOOT LEACHATE PONDS	HUMBOLDT	L
DEER CREEK DAM	HUMBOLDT	L
DESMOND DAM	HUMBOLDT	S
DUFURRENA #12 DAM	HUMBOLDT	L
DUFURRENA POND #13	HUMBOLDT	S
DUFURRENA POND 19	HUMBOLDT	L
DUFURRENA POND 20	HUMBOLDT	L
FORT MCDERMITT DAM	HUMBOLDT	H
GETCHELL MINE TAILINGS DAM	HUMBOLDT	L
JACKSON DAM	HUMBOLDT	L
JUNIPER TAILINGS DAM	HUMBOLDT	L
KNOTT CREEK RES	HUMBOLDT	S
LITTLE ONION DAM	HUMBOLDT	S
LONE TREE HOLDING POND	HUMBOLDT	S
LONE TREE MINE COOLING POND	HUMBOLDT	L
LONE TREE SECTION 23 TAILS	HUMBOLDT	S
LONE TREE SOLUTION PONDS	HUMBOLDT	L
MARIGOLD MINE TAILINGS	HUMBOLDT	L
MCDERMITT MINE TAILINGS POND #5	HUMBOLDT	L
MUD MEADOWS DAM	HUMBOLDT	L
NEWMONT TRENTON CANYON OVERFLOW POND	HUMBOLDT	L
ONION VALLEY DAM	HUMBOLDT	S
PARMAN DAM	HUMBOLDT	L
PASQUALE DAM	HUMBOLDT	S
PINON TAILINGS IMPOUNDMENT	HUMBOLDT	L
PINSON TAILINGS DAM #2	HUMBOLDT	L
QUINN RIVER CROSSING DAM	HUMBOLDT	L
RABBIT CREEK SOLUTION	HUMBOLDT	L
RABBIT CREEK SOLUTION PONDS	HUMBOLDT	L

NAME OF DAM	COUNTY	HAZARD RANKING
ROCK SPRINGS TABLE	HUMBOLDT	L
SLEEPER PROJECT	HUMBOLDT	L
SLEEPER WETLANDS	HUMBOLDT	L
SLEEPER WETLANDS EXP	HUMBOLDT	L
SOLDIER MEADOW DAM	HUMBOLDT	H
STALL DAM	HUMBOLDT	L
THOUSAND CREEK	HUMBOLDT	L
TWIN CREEKS DISTRIBUTION POND	HUMBOLDT	L
VALMY EVAPORATION POND A	HUMBOLDT	L
VALMY EVAPORATION POND B	HUMBOLDT	L
VALMY EVAPORATION POND C	HUMBOLDT	L
VALMY EVAPORATION POND D	HUMBOLDT	L
VALMY EVAPORATION POND E	HUMBOLDT	L
VALMY EVAPORATION POND F	HUMBOLDT	L
WHEELER SPRING DAM	HUMBOLDT	L
WINNEMUCCA LAGOON #1	HUMBOLDT	L
WINNEMUCCA LAGOON #10	HUMBOLDT	L
WINNEMUCCA LAGOON #2	HUMBOLDT	L
WINNEMUCCA LAGOON #3	HUMBOLDT	L
WINNEMUCCA LAGOON #4	HUMBOLDT	L
WINNEMUCCA LAGOON #5	HUMBOLDT	L
WINNEMUCCA LAGOON #6	HUMBOLDT	L
WINNEMUCCA LAGOON #7	HUMBOLDT	L
WINNEMUCCA LAGOON #8	HUMBOLDT	L
WINNEMUCCA LAGOON #9	HUMBOLDT	L
ARGENTA TAILINGS DAM	LANDER	S
AUSTIN WASTEWATER TREATMENT POND 2	LANDER	L
BATTLE MOUNTAIN EMERGENCY EFFLUENT CELL 1	LANDER	L
BATTLE MOUNTAIN EMERGENCY EFFLUENT CELL 2	LANDER	L
BATTLE MOUNTAIN WASTEWATER TREATMENT PONDS	LANDER	L
BMG MINE WILLOW CREEK DAM	LANDER	S
CALLAGHAN CREEK DAM	LANDER	S
CARICO LAKE DAM	LANDER	L
COASTAL CHEMICAL EVAPORATION POND	LANDER	L
COPPER BASIN LEACH	LANDER	L
COPPER CANYON TAILINGS	LANDER	S
CORTEZ HILLS FRESH WATER RESERVOIR	LANDER	L
CORTEZ HILLS PROCESS POND	LANDER	L
CORTEZ HILLS STORM POND	LANDER	L
CORTEZ PIPELINE TAILINGS DAM	LANDER	L
CORTEZ TAILS DAM #6	LANDER	L

NAME OF DAM	COUNTY	HAZARD RANKING
CORTEZ TAILS DAM #7	LANDER	L
CORTEZ TAILS DAM CELLS #4 & #5	LANDER	L
CORTEZ WATER STORAGE DAM	LANDER	L
ELDER CREEK SOLUTION PONDS	LANDER	L
FILIPPINI RANCH DAM	LANDER	S
FIRE CREEK PAD #2 SOLUTION PONDS	LANDER	L
FIRE CREEK SOLUTION PONDS	LANDER	L
GREYSTONE TAILS	LANDER	L
HUNT FIELD DAM	LANDER	S
IMCO TAILINGS DAM	LANDER	L
IOWA CREEK DAM	LANDER	S
IZZENHOOD DAM	LANDER	S
KINGSTON CANYON DAM	LANDER	H
KINGSTON CANYON LOWER DAM	LANDER	H
KINGSTON TAILINGS DAM	LANDER	L
LEDLIE RESERVOIR DAM	LANDER	L
MCCOY SOLUTION PONDS	LANDER	L
MCCOY/COVE TAILINGS STORAGE FACILITY	LANDER	L
MULE CANYON SOUTH PIT DAM	LANDER	L
NELSON DAM	LANDER	L
PHOENIX TAILINGS DAM	LANDER	L
PIPELINE PROJECT EMERGENCY STORM POND	LANDER	L
REONA HEAP EXPANSION EVENT POND	LANDER	L
REONA LEACH EVENT POND	LANDER	L
SECTION 8 HEAP EVENT POND	LANDER	L
SECTION 8 HEAP PLS & SEDIMENT PONDS	LANDER	L
SMITH CREEK DAM	LANDER	S
UPPER SLAVEN DAM	LANDER	L
CALIENTE WASTEWATER TREATMENT LAGOONS	LINCOLN	L
CASELTON LAST	LINCOLN	L
CASELTON NO 4	LINCOLN	L
CASELTON NO 5	LINCOLN	L
CASELTON NO 8	LINCOLN	L
CASELTON NO 9	LINCOLN	L
CASELTON NO 10	LINCOLN	L
CASTLETON MILL MIDDLE DAM	LINCOLN	L
EAGLE VALLEY RES	LINCOLN	S
ECHO CANYON DAM LINCOLN	LINCOLN	H
HOLLINGER DEBRIS	LINCOLN	L
MATHEWS CANYON	LINCOLN	H
PAHRANAGAT UPPER CROSS DIKE	LINCOLN	L

NAME OF DAM	COUNTY	HAZARD RANKING
PAHRANAGAT UPPER DAM	LINCOLN	L
PINE CANYON DAM	LINCOLN	H
SCHROEDER DAM	LINCOLN	L
TEMPIUTE TAIL	LINCOLN	S
ALKALI FLAT DAM	LYON	L
ELDORADO CANYON DAM	LYON	H
FERNLEY POND DAM #1	LYON	L
FERNLEY POND DAM #2	LYON	L
FERNLEY POND DAM #3	LYON	L
FORT CHURCHILL EVAPORATION POND #3	LYON	L
FORT CHURCHILL POWER PLANT COOLING POND	LYON	L
GOLD CANYON TAILS DAM 1	LYON	L
MASON VALLEY REFUGE NORTH POND	LYON	S
NORTH DAYTON VALLEY PRIMARY POND 1	LYON	S
NORTH DAYTON VALLEY PRIMARY POND 2	LYON	S
NORTH DAYTON VALLEY SECONDARY POND	LYON	S
NORTH DAYTON VALLEY STORAGE POND	LYON	S
NUTI AND SON RESERVOIR	LYON	L
NUTI STORAGE DAM	LYON	L
PERRIN DAM	LYON	L
SHEEP CAMP DETENTION DAM	LYON	H
STANLEY RANCH DAM	LYON	L
YERINGTON AA	LYON	L
YERINGTON BB	LYON	L
YERINGTON MILL	LYON	S
YERINGTON NO 2	LYON	S
AURORA PREGNANT POND #3	MINERAL	L
BLACK BEAUTY RESERVOIR	MINERAL	H
CAT CREEK DAM	MINERAL	H
ESMERALDA PROJECT TAILS	MINERAL	L
QUEEN VALLEY RESERVOIR	MINERAL	H
RATTLESNAKE RESERVOIR DAM	MINERAL	S
RAWHIDE PHASE IV SOLUTION PONDS	MINERAL	L
RAWHIDE SOLUTION PONDS	MINERAL	L
ROSE CREEK RESERVOIR	MINERAL	S
SANTA FE CALVADA PONDS	MINERAL	L
SANTA FE PAD #3 PONDS	MINERAL	L
SANTA FE SOLUTION PONDS	MINERAL	L
SCHURZ LAGOONS	MINERAL	L
WEBER DAM	MINERAL	H
AMERICAN BORATE NORTH EVAPORATION POND	NYE	S

NAME OF DAM	COUNTY	HAZARD RANKING
AMERICAN BORATE SOUTH TAILINGS POND	NYE	S
ANGLEWORM RANCH	NYE	L
BULLFROG EVAP POND	NYE	L
BULLFROG TAILINGS DAM CELL 3	NYE	L
BULLFROG TAILINGS DAM CELLS 1/2 COMBINED	NYE	L
BULLFROG TAILINGS DAM CELLS 3/4 COMBINED	NYE	L
COLD SPRINGS	NYE	L
CRYSTAL MARSH LOWER DAM	NYE	L
CRYSTAL MARSH UPPER DAM	NYE	L
CRYSTAL SPRINGS DAM	NYE	L
DACEY DAM	NYE	L
DAM C	NYE	L
ECHO CANYON DAM NYE	NYE	L
EQUATORIAL TONOPAH PHASE I LEACH EVENT POND	NYE	L
HAY MEADOW DAM	NYE	L
IMVITE RES	NYE	L
LAKE NO 2	NYE	L
LAKE NO 3	NYE	L
LAKE NO 4	NYE	L
LAKE NO 5	NYE	L
LAKE NO 6	NYE	L
LAKE NO 7	NYE	L
LAKE NO 8	NYE	L
LITTLE LAKE	NYE	L
MANHATTAN PROJECT LEACH PONDS	NYE	L
MANHATTAN PROJECT TAILS	NYE	L
MANZONIE DAM	NYE	L
OLD PLACE DIKE #3	NYE	L
PARADISE PEAK TAILS	NYE	L
RMG GRAVITY PLANT SEDIMENT DECANT POND	NYE	L
RMG LOWER STORAGE POND	NYE	L
RMG SOUTH 48 HOUR EVENT POND	NYE	L
RMG SOUTH LEACH PAD EVENT POND 4	NYE	L
RMG SOUTH PROCESS POND	NYE	L
RMG SOUTH PROCESS POND #2	NYE	L
RMG SOUTH STORM EVENT POND #1	NYE	L
RMG SOUTH STORM EVENT POND #2	NYE	L
RMG SOUTH STORM EVENT POND #3	NYE	L
RMG UPPER FIRE POND	NYE	L
RMG UPPER STORAGE POND	NYE	L
RMG WEST DEDICATED LEACH EVENT POND	NYE	L

NAME OF DAM	COUNTY	HAZARD RANKING
RMG WEST DEDICATED PAD PHASE II PROCESS POND	NYE	L
RMG WEST DEDICATED PAD PHASE II STORM POND	NYE	L
RMG WEST DEDICATED PAD PROCESS POND	NYE	L
RMG WEST DEDICATED PAD STORM POND	NYE	L
RMG WEST STORM POND #3	NYE	L
RMG WEST TAILINGS DAM	NYE	L
RMG WEST TAILS STORM POND	NYE	L
SEGURA DAM	NYE	L
SEYLER RESERVOIR	NYE	L
SIERRA TAILS	NYE	L
SPRING MEADOWS LAKE #1	NYE	L
SUNNYSIDE DAM	NYE	L
TENNECO MILL POND	NYE	L
TONOPAH TAILS	NYE	S
TULE FIELD DAM	NYE	L
WHIPPLE RESERVOIR	NYE	L
BIG FIVE DAM	PERSHING	L
BUSHEE CREEK DAM	PERSHING	L
COLADO MILL DAM	PERSHING	L
FLORIDA CANYON CONTINGENCY POND #3	PERSHING	L
FLORIDA CANYON ENRICHMENT POND	PERSHING	L
FLORIDA CANYON EXPANSION POND	PERSHING	L
FLORIDA CANYON SOUTH PREGNANT POND	PERSHING	L
FLORIDA CANYON UTILITY POND #1	PERSHING	L
PITT DAM	PERSHING	L
PITT TAYLOR LOWER DAM	PERSHING	L
PITT TAYLOR UPPER DAM	PERSHING	L
PUMPERNICKEL DAM	PERSHING	S
RODGERS DAM	PERSHING	L
ROSEBUD TAILINGS DAM	PERSHING	L
RYE PATCH	PERSHING	H
SILVEY IRRIGATION DAM	PERSHING	L
SOUTH SEDIMENT DAM	PERSHING	L
SPRINGER IWT DAM	PERSHING	L
SPRINGER TUNGSTEN	PERSHING	L
STANDARD GOLD EVENT POND	PERSHING	L
STANDARD GOLD PREGNANT POND #1	PERSHING	L
STANDARD GOLD PREGNANT POND #2	PERSHING	L
WEST SEDIMENT DAM	PERSHING	L
ASAMERA EFFLUENT STORAGE DAM	STOREY	H
COMSTOCK PROJECT TAILS	STOREY	H

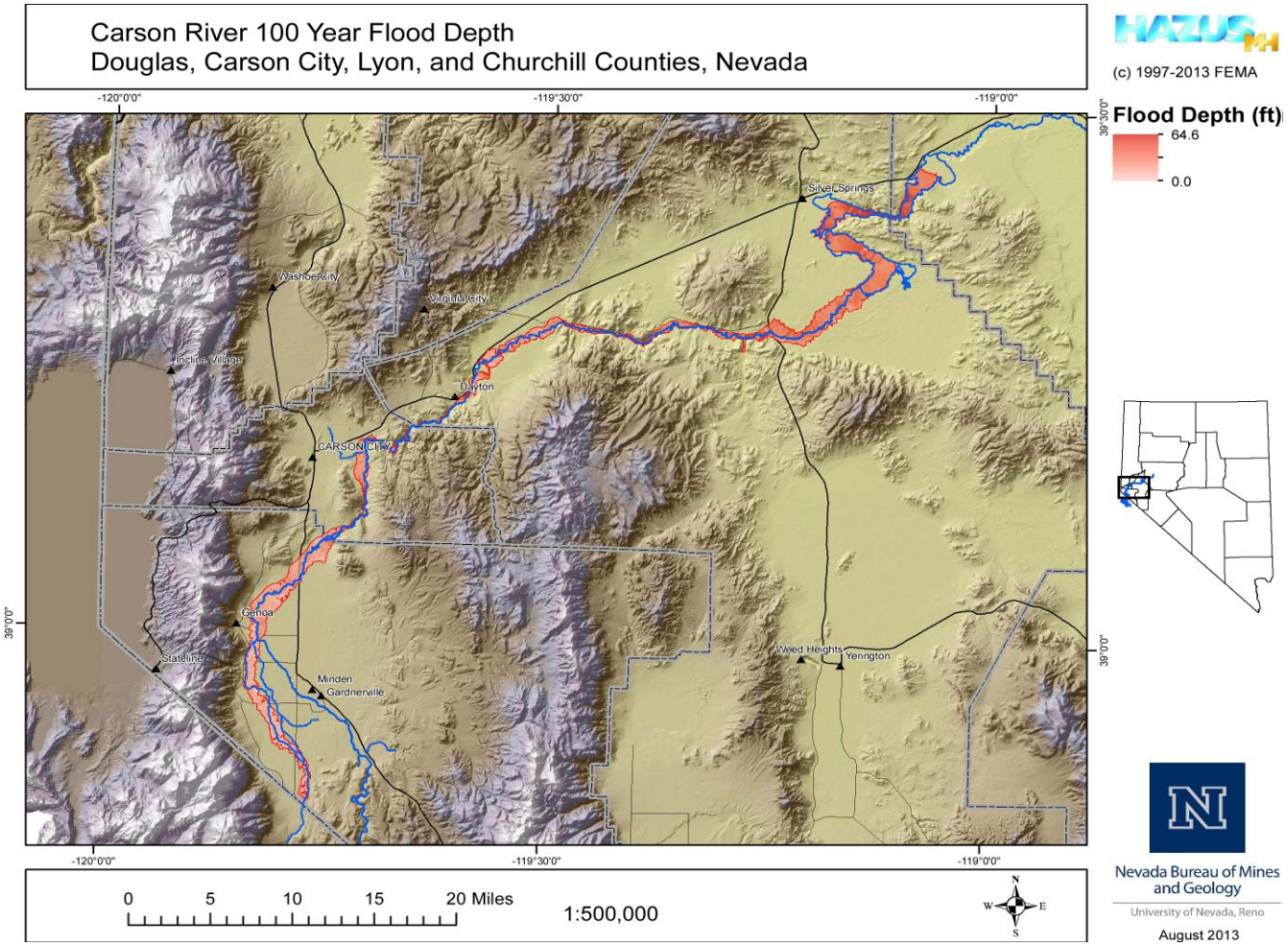
NAME OF DAM	COUNTY	HAZARD RANKING
DERBY DIVERSION	STOREY	S
GOOSEBERRY MINE TAILINGS DAM	STOREY	L
GOOSEBERRY TAILS	STOREY	L
PINON PINE EVAPORATION POND	STOREY	L
WEST TRACY SECONDARY EVAPORATION POND	STOREY	L
ALEXANDER LAKE DAM	WASHOE	S
ANDERSON RANCH	WASHOE	S
BOULDER SPRING DAM	WASHOE	L
CALLEMONT ESTATES DAM	WASHOE	H
CAPTAIN JOHNSON RESERVOIR	WASHOE	L
CARTER RESERVOIR	WASHOE	L
CATNIP	WASHOE	L
CHALK BLUFF TREATMENT PLANT PHASE I	WASHOE	S
CHALK BLUFF TREATMENT PLANT PHASE II	WASHOE	S
CIMARRON DETENTION BASIN	WASHOE	H
CLIFF BROTHERS RESERVOIR	WASHOE	L
COLEMAN RES	WASHOE	L
COPPER CANYON DETENTION DAM	WASHOE	H
COTTONWOOD DAM NO 1	WASHOE	L
COTTONWOOD DAM NO 2	WASHOE	L
DACOLE RESIDENCE DAM	WASHOE	S
DAMONTE RANCH DETENTION POND #4	WASHOE	H
DAMONTE RANCH FLOOD CONTROL DIVERSION	WASHOE	H
DAMONTE RANCH FLOOD DETENTION BASIN	WASHOE	H
DAMONTE RANCH WETLANDS DETENTION BASIN	WASHOE	H
D'ANDREA RANCH HOLE #6 POND	WASHOE	H
DANT BLVD DETENTION	WASHOE	H
DAVIS PARK LAKE	WASHOE	L
DENIO CAMP RESERVOIR	WASHOE	L
DEWEY PARKER NO 1	WASHOE	L
DEWEY PARKER NO 2	WASHOE	L
DISABET RESERVOIR DAM	WASHOE	L
DOUBLE DIAMOND	WASHOE	S
EAST WASH DIVERSION	WASHOE	H
FLY RESERVOIR	WASHOE	L
FROG POND	WASHOE	L
GERLACH EFFLUENT PONDS	WASHOE	L
GRASS VALLEY DAM	WASHOE	S
GREIL DAM	WASHOE	H
H. J. POWERS DAM	WASHOE	L
HAY CANYON DAM	WASHOE	L

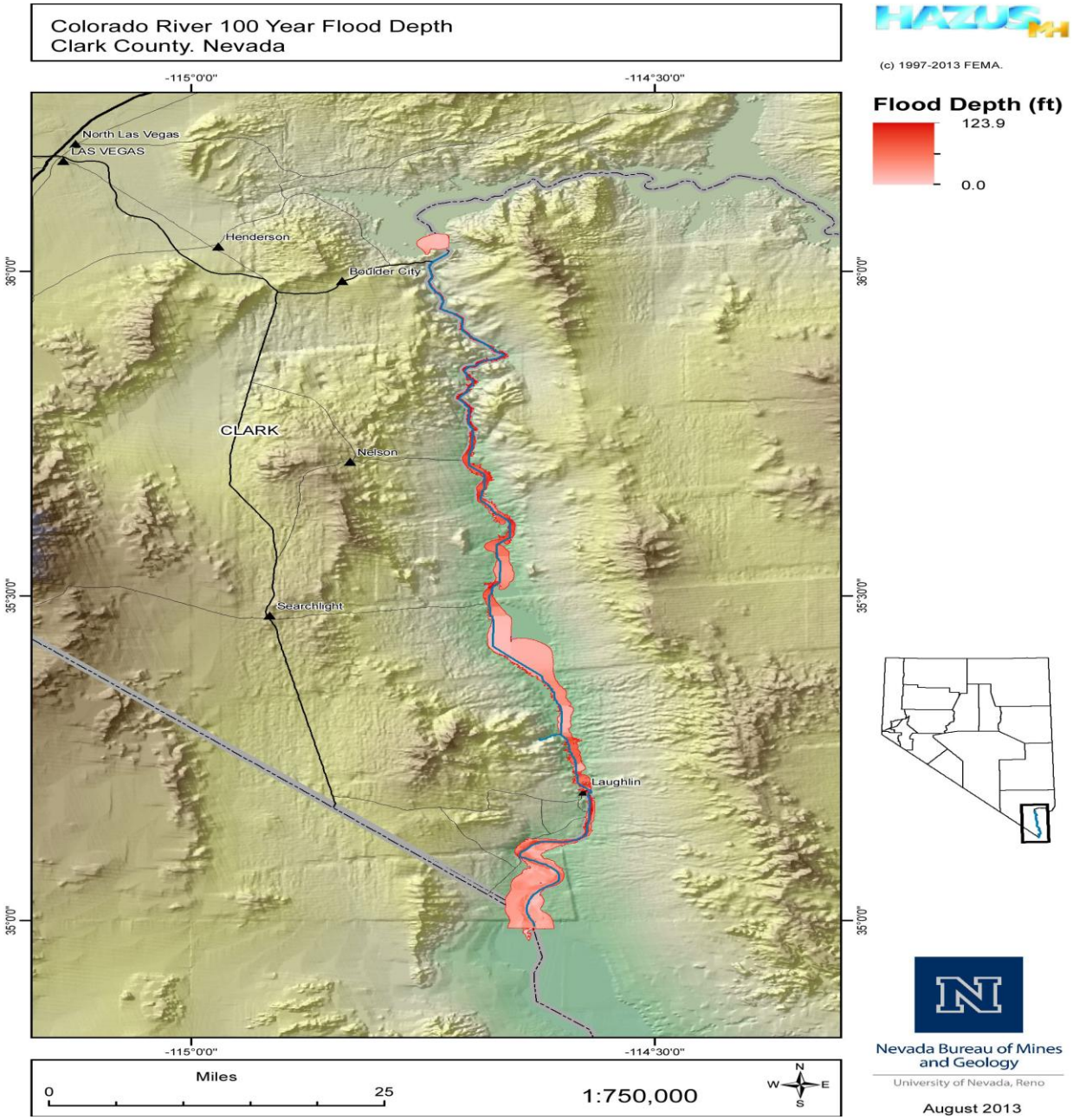
NAME OF DAM	COUNTY	HAZARD RANKING
HERMAN DAM	WASHOE	H
HIDDEN LAKE DAM	WASHOE	L
HIDDEN LAKE RANCH	WASHOE	L
HIGHLAND RESERVOIR	WASHOE	H
HILL DAM NUMBER 1	WASHOE	L
HILL DAM NUMBER 2	WASHOE	L
HOBART CREEK RESERVOIR DAM	WASHOE	S
HOME RANCH CANYON DAM	WASHOE	H
HOWARD C. DAVIS	WASHOE	S
HUFFAKER EFFLUENT STORAGE RESERVOIR	WASHOE	S
HUNGRY-BACON DAM	WASHOE	L
HUNTER CREEK RESERVOIR	WASHOE	H
INCLINE LAKE DAM	WASHOE	H
IVESON RANCH DAM	WASHOE	S
JONES CANYON DAM	WASHOE	S
KILEY RANCH STORMWATER DETENTION DAM	WASHOE	H
LEGEND TRAIL DETENTION DAM	WASHOE	H
LIGHTNING W RANCH DAMS	WASHOE	S
LITTLE HIGH ROCK	WASHOE	L
LITTLE VALLEY DAM	WASHOE	L
LORRIE'S RESERVOIR DAM	WASHOE	L
LOST CREEK RES DAM	WASHOE	L
MARLETTE LAKE DAM	WASHOE	H
MARLETTE RESERVOIR	WASHOE	H
MATLEY DAM	WASHOE	L
MIDDLE DAM	WASHOE	L
MILK RANCH DAM	WASHOE	L
MILL CREEK NO 1	WASHOE	H
MILL CREEK NO 2	WASHOE	H
NEGRO CREEK DAM	WASHOE	S
NORTH SPANISH SPRINGS FLOOD DETENTION FACILITY	WASHOE	H
NORTH SPANISH SPRINGS FLOOD SEDIMENT BASIN	WASHOE	H
NORTH VIRGINIA DETENTION	WASHOE	H
NORTHGATE GOLF COURSE DAM	WASHOE	H
OLINGHOUSE EVENT POND	WASHOE	S
OLINGHOUSE TAILS	WASHOE	L
PAGNI DAM	WASHOE	H
PEAVINE CREEK LOWER DAM	WASHOE	H
PEAVINE CREEK UPPER DAM	WASHOE	H
PRADARE SPRING DAM	WASHOE	L
RACETRACK RES DAM	WASHOE	L

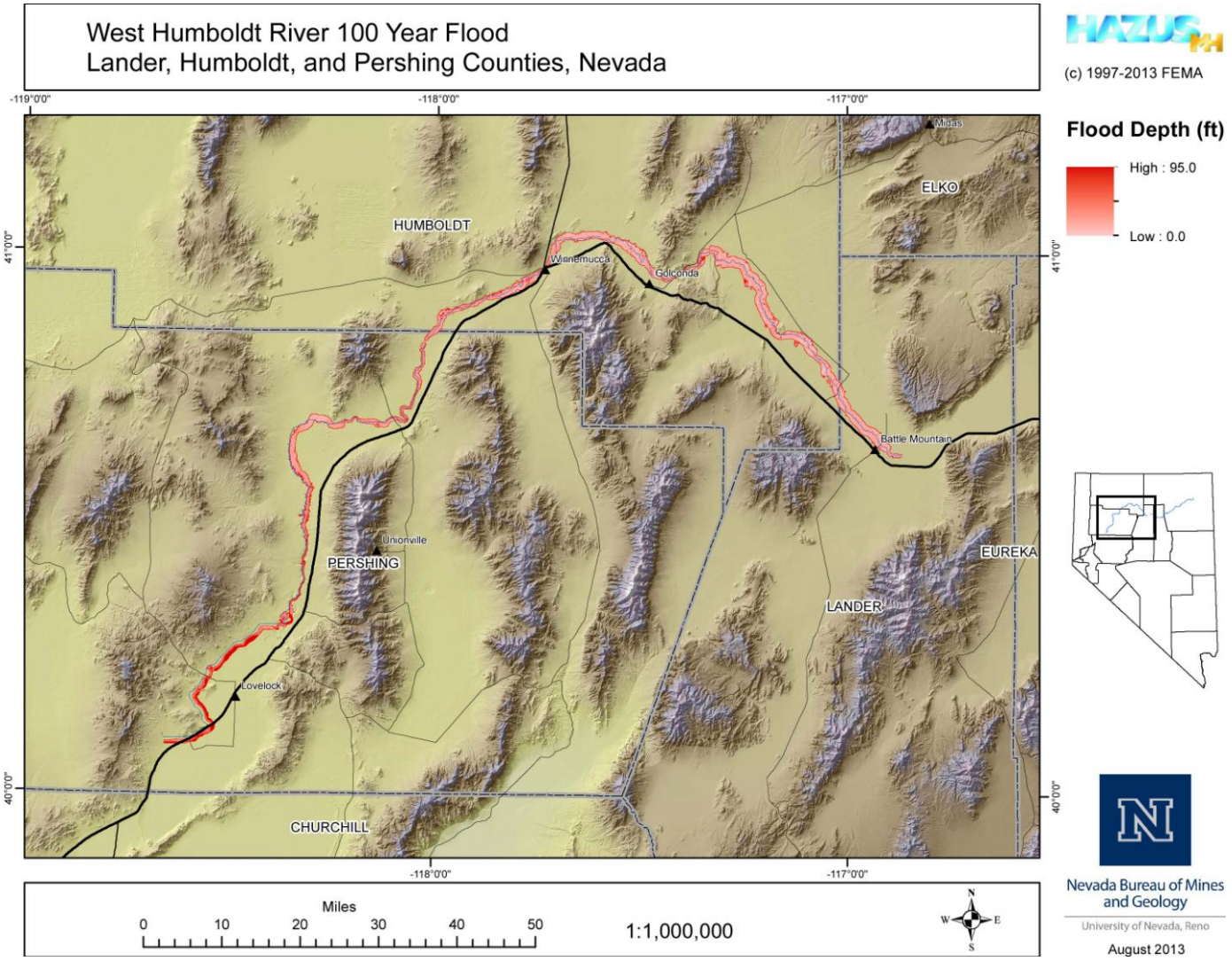
NAME OF DAM	COUNTY	HAZARD RANKING
RANCHO HAVEN DAM #1	WASHOE	H
RANCHO HAVEN DAM #2	WASHOE	S
RANCHO HAVEN DAM #3	WASHOE	S
RANCHO HAVEN DAM #4	WASHOE	S
RED HOUSE DIVERSION DAM	WASHOE	L
RENO POWER DAM	WASHOE	L
RODERO CREEK DAM	WASHOE	L
RYE CREEK RES	WASHOE	L
SEVIER LAKE	WASHOE	H
SIDEHILL DETENTION BASIN	WASHOE	S
SIERRA SAGE PONDS	WASHOE	S
SOMERSETT DETENTION POND #13	WASHOE	H
SOMERSETT DETENTION POND #14	WASHOE	H
SOUTH TRUCKEE MEADOWS CDB FACILITY POND #4	WASHOE	L
SOUTH TRUCKEE MEADOWS CDB FACILITY PONDS #5 & #6	WASHOE	L
SPANISH FLAT DAM	WASHOE	L
SPANISH SPRINGS STORMWATER DETENTION FACILITY	WASHOE	H
SQUAW CREEK DAM	WASHOE	S
SUGAR CANE SPRINGS DAM	WASHOE	L
SUN VALLEY DETENTION DAM	WASHOE	H
SWAN LAKE RES	WASHOE	L
SWINGLE RANCH DAM	WASHOE	L
TONEY RES DAM	WASHOE	L
TOWLE DAM	WASHOE	H
VERDI MEADOWS WASTEWATER DISPOSAL DAM	WASHOE	H
VICKIE'S RESERVOIR DAM	WASHOE	L
VIRGINIA LAKE	WASHOE	S
WALL CREEK DAM LOWER	WASHOE	S
WALL CREEK DAM UPPER	WASHOE	L
WASHOE DIVERSION DAM	WASHOE	L
WASHOE LAKE DAM	WASHOE	H
WEST WASH DAM	WASHOE	H
WET RAVINE DAM	WASHOE	S
WETLANDS AT KILEY RANCH	WASHOE	S
WHEELER RESERVOIR DAM	WASHOE	H
WILCOX CANYON DAM #1	WASHOE	H
WILCOX CANYON DAM #2	WASHOE	L
WILCOX CANYON DAM #3	WASHOE	S
171 AC MCGILL	WHITE PINE	L
78 AC MCGILL	WHITE PINE	L
ALLIGATOR RIDGE TAILS	WHITE PINE	L

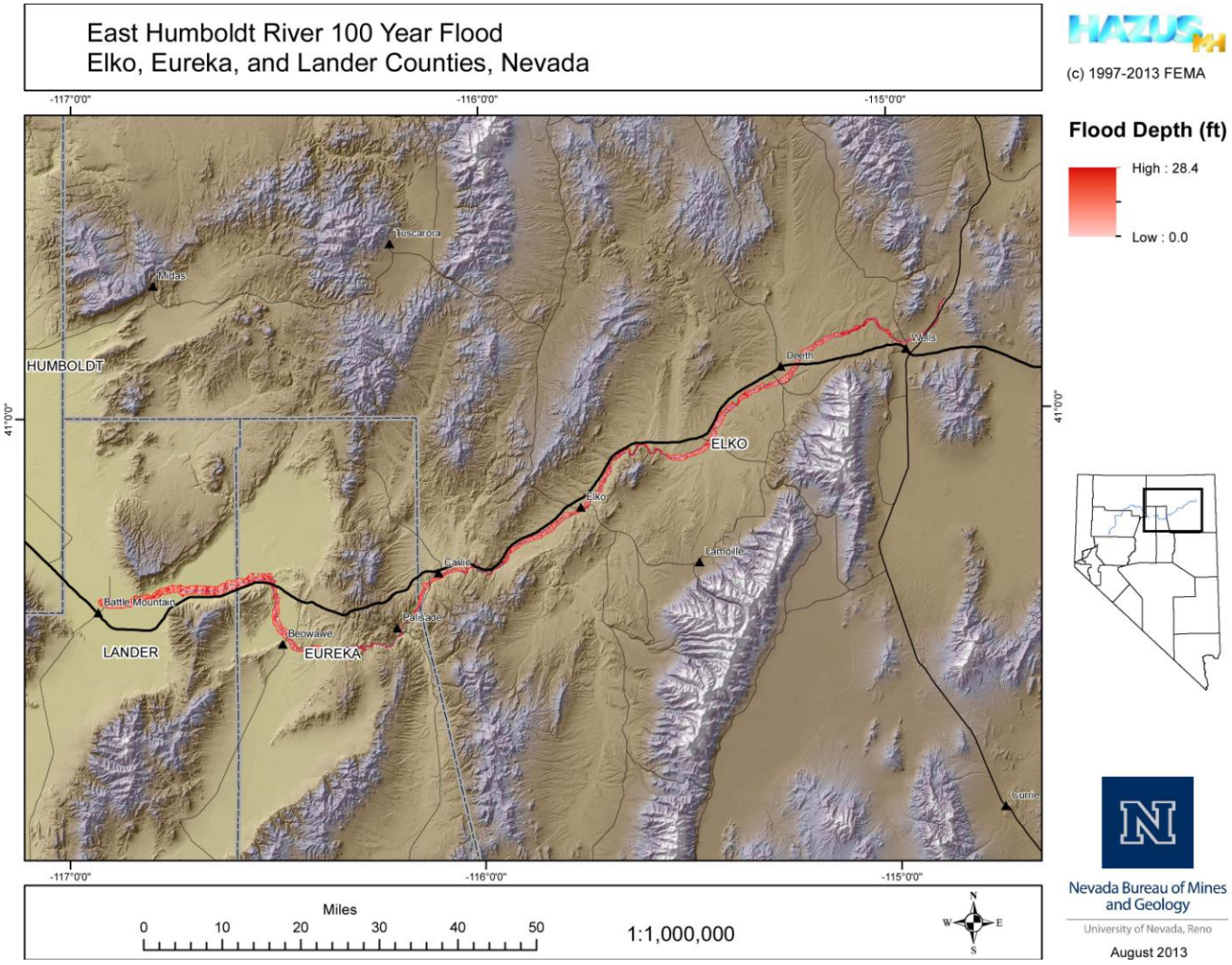
NAME OF DAM	COUNTY	HAZARD RANKING
BAKER GID WASTEWATER POND	WHITE PINE	L
BALD MOUNTAIN MINE LEACH POND #6	WHITE PINE	L
BALD MOUNTAIN PREGNANT POND #5	WHITE PINE	L
BALD MOUNTAIN PROCESS POND #7	WHITE PINE	L
BASSETT LAKE	WHITE PINE	L
BLACKJACK DAM	WHITE PINE	S
BULL CREEK NO 2	WHITE PINE	L
BULL CREEK NO 3	WHITE PINE	S
CAVE CREEK DAM	WHITE PINE	H
COLD CREEK DAM	WHITE PINE	S
COMINS LAKE	WHITE PINE	S
DUCK CREEK EAST	WHITE PINE	H
DUCK CREEK WEST	WHITE PINE	H
ELDERBERRY NO 2	WHITE PINE	H
GARDNER DAM	WHITE PINE	S
GEYSER DAM NO 2	WHITE PINE	L
GEYSER DAM NO 3	WHITE PINE	L
GEYSER DAM NO 5	WHITE PINE	L
GIROUX TAILINGS IMPOUNDMENT	WHITE PINE	S
GOSHUTE DAM	WHITE PINE	L
ICE PLANT NO 1	WHITE PINE	H
ICE PLANT NO 2	WHITE PINE	H
ILLIPAH POND	WHITE PINE	H
MCGILL CONCENTRATOR TAILS	WHITE PINE	L
PRESTON DAM	WHITE PINE	L
PRESTON LOWER DAM	WHITE PINE	S
SILVER CREEK DAM	WHITE PINE	H
SPRING VALLEY WASH	WHITE PINE	L
TAYLOR OPERATION	WHITE PINE	L
WPES EVAPORATION POND	WHITE PINE	S

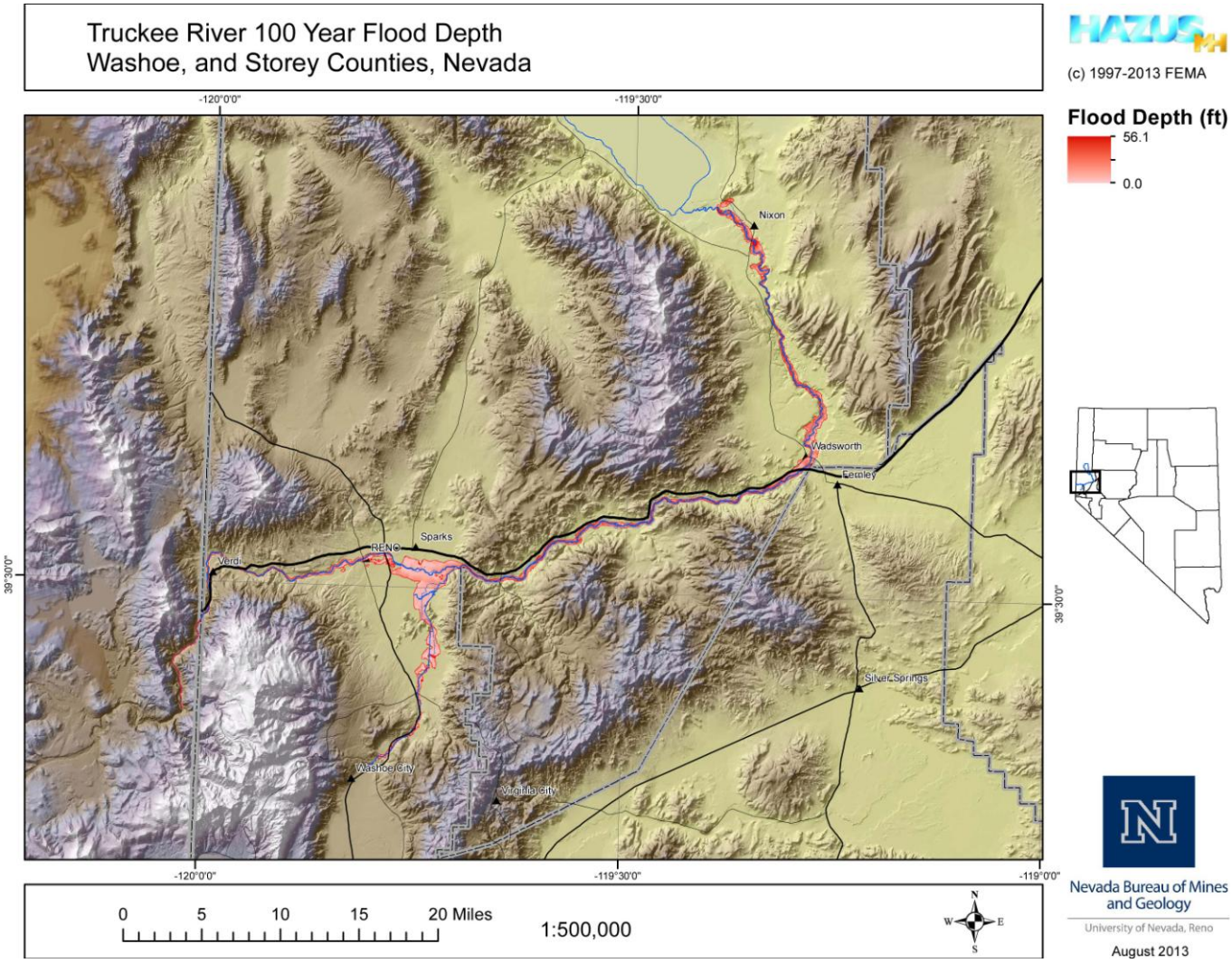
Humboldt R. (West)
Humboldt R. (East)
Winnemucca
Elko
Battle Mountain
Truckee R
Carson R.
Reno
Fallon
Carson City
Walker R.
Ely
Tonopah
Pioche
Virgin R
Muddy R.
Las Vegas
Colorado R.
93
80
50
95
15

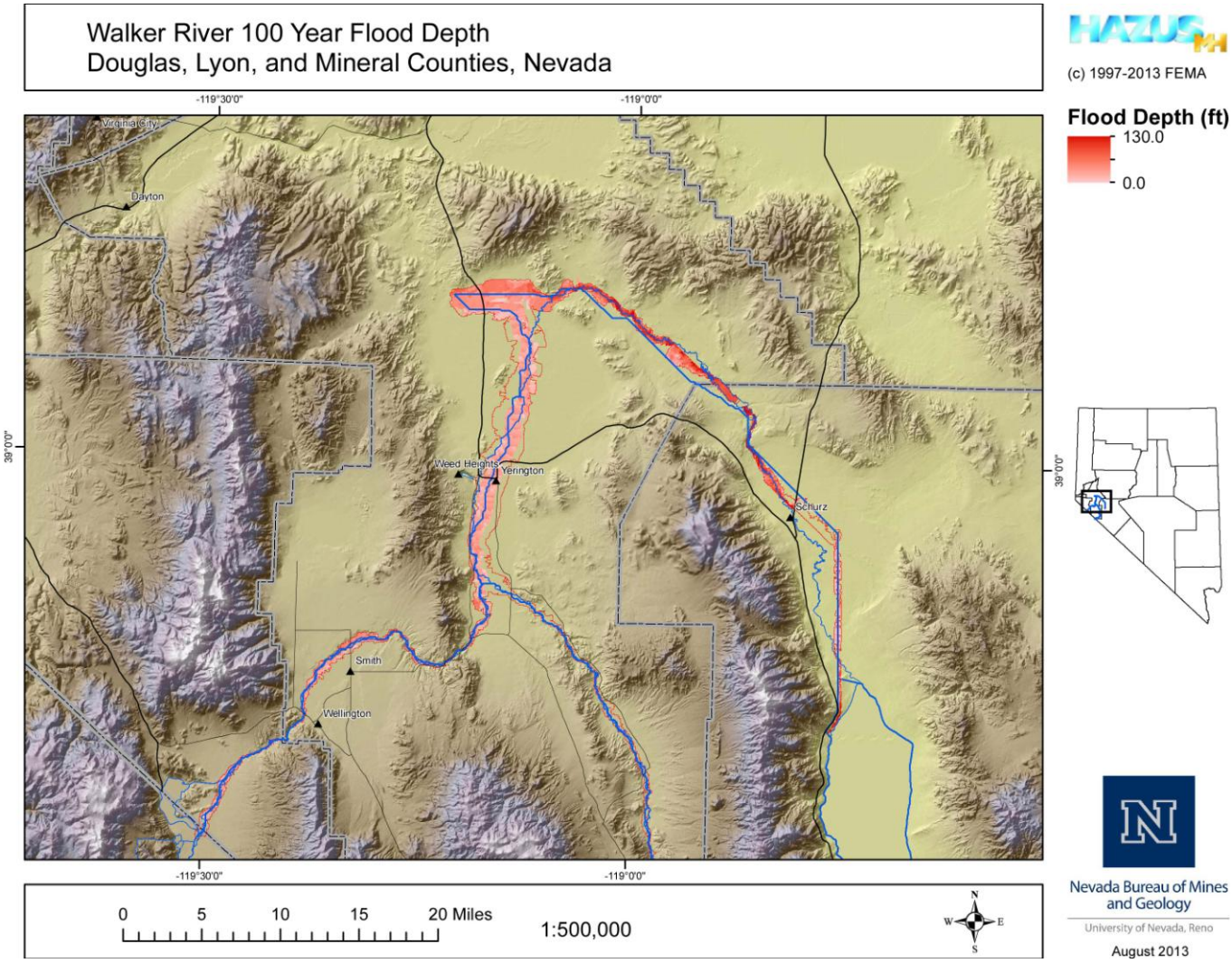

Carson River 100 Year Flood Depth
Douglas, Carson City, Lyon, and Churchill Counties, Nevada
(c) 1997-2013 FEMA
Flood Depth (ft)
64.6
0.0
-120°0'0"
-119°30'0"
-119°0'0"
39°30'0"
39°0'0"
Silver Springs
Washoe City
Virginia City
Incline Village
Dayton
CARSON CITY
Genoa
Stateline
Minden
Gardnerville
Weed Heights
Yerington
0 5 10 15 20 Miles
1:500,000
N
S
E
W
Nevada Bureau of Mines and Geology
University of Nevada, Reno
August 2013

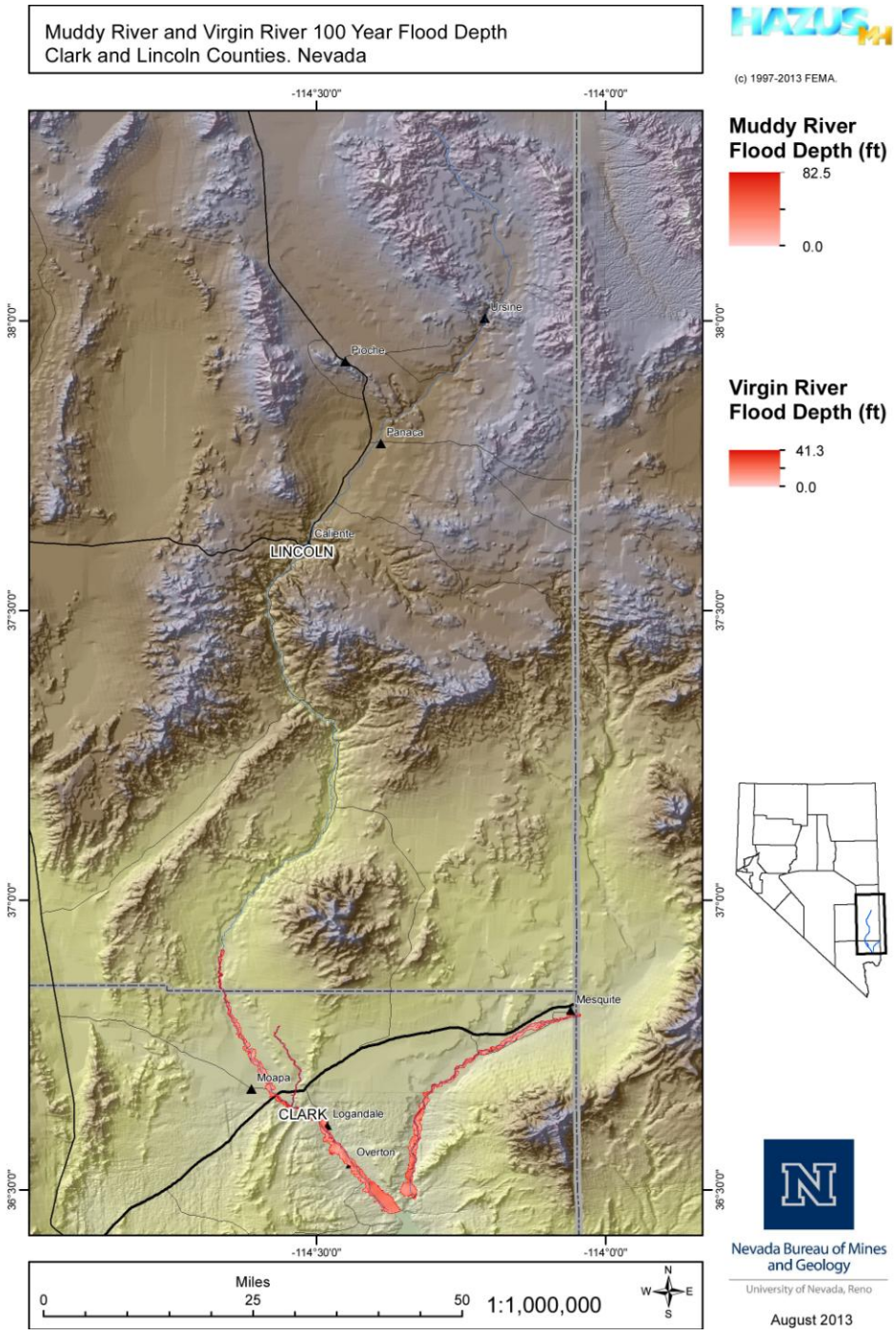

Colorado River 100 Year Flood Depth
Clark County. Nevada
(c) 1997-2013 FEMA.
Flood Depth (ft)
123.9
0.0
-115°0'0"
-114°30'0"
36°0'0"
35°30'0"
35°0'0"
North Las Vegas
LAS VEGAS
Henderson
Boulder City
CLARK
Nelson
Searchlight
Laughlin
Miles
0
25
1:750,000
N
W
E
S
Nevada Bureau of Mines and Geology
University of Nevada, Reno
August 2013


West Humboldt River 100 Year Flood
Lander, Humboldt, and Pershing Counties, Nevada
(c) 1997-2013 FEMA
Flood Depth (ft)
High : 95.0
Low : 0.0
-119°0'0"
-118°0'0"
-117°0'0"
41°0'0"
40°0'0"
HUMBOLDT
ELKO
PERSHING
EUREKA
LANDER
CHURCHILL
Winnemucca
Golconda
Battle Mountain
Unionville
Lovelock
Midas
Miles
0 10 20 30 40 50
1:1,000,000
N
S
E
W
Nevada Bureau of Mines and Geology
University of Nevada, Reno
August 2013


East Humboldt River 100 Year Flood
Elko, Eureka, and Lander Counties, Nevada
(c) 1997-2013 FEMA
Flood Depth (ft)
High : 28.4
Low : 0.0
-117°0'0"
-116°0'0"
-115°0'0"
41°0'0"
HUMBOLDT
ELKO
LANDER
EUREKA
Tuscarora
Midas
Wells
Deeth
Elko
Lamoille
Carlin
Battle Mountain
Beowawe
Palisade
Currie
Miles
0 10 20 30 40 50
1:1,000,000
N
S
E
W
Nevada Bureau of Mines and Geology
University of Nevada, Reno
August 2013


Truckee River 100 Year Flood Depth
Washoe, and Storey Counties, Nevada
(c) 1997-2013 FEMA
Flood Depth (ft)
56.1
0.0
-120°0'0"
-119°30'0"
39°30'0"
Nixon
Wadsworth
Fernley
Sparks
RENO
Verdi
Silver Springs
Washoe City
Virginia City
0 5 10 15 20 Miles
1:500,000
N
W
E
S
Nevada Bureau of Mines and Geology
University of Nevada, Reno
August 2013


Walker River 100 Year Flood Depth
Douglas, Lyon, and Mineral Counties, Nevada
(c) 1997-2013 FEMA
Flood Depth (ft)
130.0
0.0
-119°30'0"
-119°0'0"
39°0'0"
Virginia City
Dayton
Weed Heights
Yerington
Schurz
Smith
Wellington
0 5 10 15 20 Miles
1:500,000
N
W
E
S
Nevada Bureau of Mines and Geology
University of Nevada, Reno
August 2013


Muddy River and Virgin River 100 Year Flood Depth
Clark and Lincoln Counties. Nevada
(c) 1997-2013 FEMA.
Muddy River
Flood Depth (ft)
82.5
0.0
Virgin River
Flood Depth (ft)
41.3
0.0
-114°30'0"
-114°0'0"
38°0'0"
37°30'0"
37°0'0"
36°30'0"
Ursine
Pioche
Panaca
Caliente
LINCOLN
Mesquite
Moapa
CLARK
Logandale
Overton
Miles
0
25
50
1:1,000,000
N
W
E
S
Nevada Bureau of Mines and Geology
University of Nevada, Reno
August 2013

Assurances to Comply with Federal Laws and Regulations

FEDERAL ASSURANCES

The applicant hereby assures and certifies compliance with all federal statutes, regulations, policies, guidelines and requirements, including OMB Circulars No. A-21, A-110, A-122, A-128, A-133, A-87; E.O. 12372 and Uniform Administrative Requirements for Grants and Cooperative Agreements 28 CFR, Part 66, Common rule, that govern the application, acceptance and use of federal funds for this federally-assisted project. Administrative Requirements 44 CFR Part 13, Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments, 2 CFR Part 215, Institutions of Higher Education, Hospital and other Non-Profit Organizations. Cost Principles, 2 CFR Part 225, State and Local Governments, 2 CFR Part 220, Educational Institutions, 2 CFR Part 230 Non-Profit Organizations and Federal Acquisitions Regulations Sub-part 31.2, Contracts with Commercial Organizations. In addition, the applicant assures and certifies that:

I. It possesses legal authority to apply for the grant; that a resolution, motion or similar action has been duly adopted or passed as an official act of the applicant's governing body, authorizing the filing of the application, including all understandings and assurances contained therein, and directing and authorizing the person identified as the official representative of the applicant to act in connection with the application and to provide such additional information as may be required.

II. It will comply with requirements of the provisions of the Uniform Relocation Assistance and Real Property Acquisitions Act of 1970 (P.L. 91-646) which provides for fair and equitable treatment of persons displaced as a result of federal and federally-assisted programs.

III. It will comply with provisions of federal law which limit certain political activities of employees of a state or local unit of government whose principal employment is in connection with an activity financed in whole or in part by Federal grants. (5 USC 1501, et seq.)

IV. It will comply with the minimum wage and maximum hour's provisions of the Federal Fair Labor Standards Act.

V. It will establish safeguards to prohibit employees from using their positions for a purpose that is or gives the appearance of being motivated by a desire for private gain for themselves or others, particularly those with whom they have family, business, or other ties.

VI. It will give the sponsoring agency or the Comptroller General, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the grant.

VII. It will comply with all requirements imposed by the federal sponsoring agency concerning special requirements of law, program requirements, and other administrative requirements.

VIII. It will insure that the facilities under its ownership, lease or supervision which shall be utilized in the accomplishment of the project are not listed on the Environmental Protection Agency's (EPA) list of Violating Facilities and that it will notify the Federal grantor agency of the receipt of any communication from the Director of the EPA Office of Federal Activities indicating that a facility to be used in the project is under consideration for listing by the EPA.

IX. It will comply with the flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973, Public Law 93-234, 87 Stat. 975, approved December 31, 1976, Section 102(a) requires, on and after March 2, 1975, the purchase of flood insurance in communities where such insurance is available as a condition for the receipt of any Federal financial assistance for construction or acquisition purposes for use in any area that has been identified by the Secretary of the Department of Housing and Urban Development as an area having special flood hazards. The phrase "federal financial assistance" includes any form of loan, grant, guaranty, insurance payment, rebate, subsidy, disaster assistance loan or grant, or any other form of direct or indirect Federal assistance.

X. Environmental and Historic Preservation Compliance. FEMA is required to consider the potential impacts to the human and natural environment of projects proposed for FEMA funding. FEMA, through its Environmental and Historic Preservation (EHP) Program, engages in a review process to ensure that FEMA-funded activities comply with various Federal laws including: National Environmental Policy Act, National Historic Preservation Act, Endangered Species Act, and Executive Orders on Floodplains (11988), Wetlands (11990) and Environmental Justice (12898).

- **a.** Any project with the potential to impact EHP resources (see Section E.8) cannot be initiated until FEMA has completed its review. The sub-grantees shall provide any information requested by FEMA to ensure compliance with applicable Federal EHP requirements.
- **b.** Grantees may be required to provide detailed information about the project, including the following: location (street address or map coordinates); description of the project including any associated ground disturbance work, extent of modification of existing structures, construction equipment to be used, staging areas, access roads, etc.; year the existing facility was built; natural, biological, and/or cultural resources present in the project vicinity; visual documentation such as site and facility photographs, project plans, maps, etc; and possible project alternatives. For certain types of projects, FEMA must consult with other Federal, state and local agencies such as the U.S. Fish and Wildlife Service, State Historic Preservation Offices, and the U.S. Army Corps of Engineers, as well as other Federal, State, Local and Tribal Nations agencies and organizations responsible for protecting natural and cultural resources.
- **c.** For projects with the potential to have significant adverse effects on the environment and/or historic properties, FEMA's EHP review and consultation may result in a substantive agreement between the involved parties outlining how the sub-grantee will avoid the effects, minimize the effects, or, if necessary, compensate for the effects. Because of the potential for significant adverse effects to EHP resources or public controversy, some projects may require an additional assessment or report, such as an Environmental Assessment, Biological Assessment, archaeological survey, cultural resources report, wetlands delineation, or other document, as well as a public comment period.
- **d.** Sub-grantees are responsible for the preparation of such documents, as well as for the implementation of any treatment or mitigation measures identified during the EHP review that are necessary to address potential adverse impacts.
- **e.** Failure of the sub-grantee to meet Federal, State, and local EHP requirements, obtain applicable permits, and comply with any conditions that may be placed on the project as the result of FEMA's EHP review may jeopardize Federal funding.

XI. It will comply, and assure the compliance of all its sub-sub-grantees and contractors, with the applicable provisions of Title I of the Omnibus Crime Control and Safe Streets Act of 1968, as amended, the Juvenile Justice and Delinquency Prevention Act, or the Victims of Crime Act, as appropriate; the provisions of the current edition of the Office of Justice Programs Financial and Administrative Guide for Grants, M7100.1; and all other applicable federal laws, orders circulars, or regulations.

XII. It will comply with the provisions of 28 CFR applicable to grants and cooperative agreements including Part 18, Administrative Review Procedure; Part 20, Criminal Justice Information Systems; Part 22, Confidentiality of Identifiable Research and Statistical Information; Part 23, Criminal Intelligence Systems Operating Policies; Part 30, Intergovernmental Review of Department of Justice Programs and Activities; Part 42, Nondiscrimination/Equal Employment Opportunity Policies and Procedures; Part 61, Procedures for Implementing the National Environmental Policy Act; Part 63, Floodplain Management and Wetland Protection Procedures; and Federal laws or regulations applicable to Federal Assistance Programs.

XIII. It will comply, and all its sub-grantee and contractors will comply, with the non-discrimination requirements of the Omnibus Crime Control and Safe Streets Act of 1968, as amended, 42 USC 3789(d), or Victims of Crime Act (as appropriate); Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973, as amended; Subtitle A, Title II of the Americans with Disabilities Act (ADA) (1990); Title IX of the Education Amendments of 1972; the Age Discrimination Act of 1975; Department of Justice Non-Discrimination Regulations, 28 CFR Part 42, Subparts C, D, E, and G; and Department of Justice regulations on disability discrimination, 28 CFR Part 35 and Part 39.

XIV. Services to limited English proficient (LEP) persons. Recipients of FEMA financial assistance are required to comply with several Federal civil rights laws, including Title VI of the Civil Rights Act of 1964, as amended. These laws prohibit discrimination on the basis of race, color, religion, natural origin, and sex in the delivery of services. National origin discrimination includes discrimination on the basis of limited English proficiency.

- **a.** To ensure compliance with Title VI, recipients are required to take reasonable steps to ensure that LEP persons have meaningful access to their programs. Meaningful access may entail providing language assistance services, including oral and written translation, where necessary.
- **b.** The sub-grantee is encouraged to consider the need for language services for LEP persons served or encountered both in developing their proposals and budgets and in conducting their programs and activities. For additional information, see http://www.lep.gov. Integrating individuals with disabilities into emergency planning. Section 504 of the Rehabilitation Act of 1973, as amended, prohibits discrimination against people with disabilities in all aspects of emergency mitigation, planning, response, and recovery by entities receiving financial funding from FEMA.
- **c.** Executive Order #13347, entitled "Individuals with Disabilities in Emergency Preparedness" signed in July 2004, requires the Federal Government to support safety and security for individuals with disabilities in situations involving disasters, including earthquakes, tornadoes, fires, floods, hurricanes, and acts of terrorism.
- **d.** Executive Order 13347 requires the federal government to, among other things, encourage consideration of the needs of individuals with disabilities served by State, local, and tribal governments in emergency preparedness planning.
- **e.** FEMA has several resources available to assist emergency managers in planning and response efforts related to people with disabilities and to ensure compliance with Federal civil rights laws:

  Guidelines for Accommodating Individuals with Disabilities in Disaster: The Guidelines synthesize the array of existing accessibility requirements into a user friendly tool for use by response and recovery personnel in the field.

  - **i.** Guidelines are available at, http://www.fema.gov/oer/reference/
  - **ii.** Disability and Emergency Preparedness Resource Center: A web based "Resource Center" that includes dozens of technical assistance materials to assist emergency managers in planning and response efforts related to people with disabilities can be found at, http://www.disabilitypreparedness.gov
  - **iii.** Emergency Planning for Persons with Disabilities and Special Needs: http://www.LLIS.gov

XV. In the event a federal or state court or federal or state administrative agency makes a finding of discrimination after a due process hearing on the grounds of race, color, religion, national origin, sex, or disability against a recipient of funds, the recipient will forward a copy of the finding to the Office for Civil Rights, Office of Justice Programs.

XVI. It will provide an Equal Employment Opportunity Program if required to maintain one, where the application is for $500,000 or more.

XVII. It will comply with the provisions of the Coastal Barrier Resources Act (P.L. 97-348) dated October 19, 1982 (16 USC 3501 et seq.) which prohibits the expenditure of most new Federal funds within the units of the Coastal Barrier Resources System.

XVIII. Compliance with the National Energy Conservation Policy and Energy Policy Acts. In accordance with the 2008 DHS Appropriations Act, all FY 2008 grant funds must comply with the following two requirements:

- **a.** None of the funds made available through shall be used in contravention of the Federal buildings performance and reporting requirements of Executive Order No. 13123, part 3 of title V of the National Energy Conservation Policy Act (42 USC 8251 et. Seq.), or subtitle A of title I of the Energy Policy Act of 2005 (including the amendments made thereby).
- **b.** None of the funds made available shall be used in contravention of section 303 of the Energy Policy Act of 1992 (42 USC13212).

XIX. HSPD-5 requires that federal agencies tie federal preparedness funding eligibility directly to progress on **NIMS implementation**. Inability to demonstrate compliance with required NIMS implementation activities could affect federal preparedness funding at any level of government – state agency, county, local jurisdiction or department. Those receiving, or planning to receive, federal preparedness funding from any federal sources should examine the applicable grant guidance to determine eligibility requirements.

VICTIMS PROTECTION ACT OF 2000

XX. Implements section 106(g) of the trafficking Victims Protection Act of 2000 (TVPA) as amended (22 U.SC. 7104 (g).

CLASSIFIED NATIONAL SECURITY INFORMATION

XXI. "Classified national security information" as defined in the Executive Order (EO) 12958, as amended, means information that has been determined pursuant to EO 12958 or any predecessor order to require protection against unauthorized disclosure and is marked to indicate its classified status when in documentary form.

TRANSPARENCY ACT

XXII. As of October 1, 2010, all federal agencies are to initiate sub-award reporting pursuant to P.L. 109-282 of the Federal Funding Accountability and Transparency Act. This includes an implementation policy to require the collection and reporting on sub-award data, improvement to the data quality of Federal Awards and enhancement of technological capabilities of the USAspending.gov.

As the duly authorized representative of the applicant, I hereby certify that the applicant will comply with the above assurances and certifications.

NAME:_____ TITLE:_____

SIGNATURE:_____ DATE:_____

*Must be signed by the County Manager/Chief Financial Officer, the Tribal Chairman/designee or the state agency director as appropriate

Applicants should refer to the regulations cited below to determine the certification to which they are required to attest. Signature of this form provides for compliance with certification requirements under 28 CFR Part 69, "New Restrictions on Lobbying" and 28 CFR Part 67, "Government-wide Debarment and Suspension (Non-procurement) and Government-wide Requirements for Drug- Free Workplace (Grants)." The certifications shall be treated as a material representation of fact upon which reliance will be placed when determination is made to award the covered transaction, grant, or cooperative agreement.

I. LOBBYING

1. As required by Section 1352, Title 31 of the U.S. Code, and implemented at 28 CFR Part 69, for persons entering into a grant or cooperative agreement over $100,000, as defined at 28 CFR Part 69, the applicant certifies that:

a. No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the making of any federal grant, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any federal grant or cooperative agreement;

b. If any funds other than federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal grant or cooperative agreement, the undersigned shall complete and submit Standard Form - LLL, "Disclosure of Lobbying Activities," in accordance with its instructions;

c. The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including sub-grants, contracts under grants and cooperative agreements, and subcontracts) and that all sub-recipients shall certify and disclose accordingly.

II. DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS

As required by Executive Order 12549, Debarment and Suspension, and implemented at 28 CFR Part 67, for prospective participants in primary covered transactions, as defined at 28 CFR Part 67

1. The applicant certifies that it and its principals:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, sentenced to a denial of federal benefits by a state or federal court, or voluntarily excluded from covered transactions by any Federal department or agency;

b. Have not within a three-year period preceding this application been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (federal, state, or local) with commission of any of the offenses enumerated in paragraph (1) (b) of this certification; and

d. Have not within a three-year period preceding this application had one or more public transactions (federal, state, or local) terminated for cause or default; and

2. Where the applicant is unable to certify to any of the statements in this certification, he or she shall attach an explanation to this application.

III. DRUG-FREE WORKPLACE (SUB-GRANTEES OTHER THAN INDIVIDUALS)

As required by the Drug-Free Workplace Act of 1988, and implemented at 28 CFR Part 67, Subpart F, for sub-grantees, as defined at 28 CFR Part 67

1. The applicant certifies that it will or will continue to provide a drug-free workplace by:

- **a.** Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the sub-grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;
- **b.** Establishing an on-going drug-free awareness program to inform employees about
  - **i.** The dangers of drug abuse in the workplace;
  - **ii.** The sub-grantee's policy of maintaining a drug-free workplace;
  - **iii.** Any available drug counseling, rehabilitation, and employee assistance programs; and
  - **iv.** The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;
- **c.** Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);
- **d.** Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will
  - **i.** Abide by the terms of the statement; and
  - **ii.** Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction;
- **e.** Notifying the agency, in writing, within 10 calendar days after receiving notice from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to the Department of Homeland Security. Notice shall include the identification number(s) of each affected grant;
- **f.** Taking one of the following actions, within 30 calendar days of receiving notice with respect to any employee who is so convicted
  - **i.** Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or
  - **ii.** Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a federal, state, or local health, law enforcement, or other appropriate agency;
- **g.** Making a good faith effort to continue to maintain a drug-free workplace.

IV. NON-SUPPLANTING CERTIFICATION

This certification affirms that grant funds will be used to supplement existing funds, and will not replace (supplant) funds that have been appropriated for the same purpose. Applicants or sub-grantees may be required to supply documentation certifying that a reduction in non-Federal resources occurred for reasons other than the receipt or expected receipt of Federal funds.

VICTIMS PROTECTION ACT OF 2000

V. Implements section 106(g) of the trafficking Victims Protection Act of 2000 (TVPA) as amended (22 U.SC. 7104 (g).

CLASSIFIED NATIONAL SECURITY INFORMATION

VI. "Classified national security information" as defined in the Executive Order (EO) 12958, as amended, means information that has been determined pursuant to EO 12958 or any predecessor order to require protection against unauthorized disclosure and is marked to indicate its classified status when in documentary form.

TRANSPARENCY ACT

VII. As of October 1, 2010, all federal agencies are to initiate sub-award reporting pursuant to P.L. 109-282 of the Federal Funding Accountability and Transparency Act. This includes an implementation policy to require the collection and reporting on sub-award data, improvement to the data quality of Federal Awards and enhancement of technological capabilities of the USAspending.gov.

As the duly authorized representative of the applicant, I hereby certify that the applicant will comply with the above assurances and certifications.

NAME:_____ TITLE:_____

SIGNATURE:_____ DATE:_____

* Must be signed by the County Manager/Chief Financial Officer, the Tribal Chairman/designee or the state agency director as appropriate

NEVADA DEPARTMENT OF PUBLIC SAFETY
DIVISION OF EMERGENCY MANAGEMENT (DEM)
GRANT FINANCIAL AND PROGRAM ASSURANCES

These assurances are to specify the requirements for State, Local, Indian Tribal Governments, higher education, hospitals, and other non-profit organizations while performing the administrative functions for any federal grant funds. The applicant hereby assures compliance with the following conditions as part of the Notice of Grant Award:

I. FEDERAL SINGLE AUDIT

1. Sub-grantee's shall comply with the Federal Single Audit Act (31 U.S.C. par., 7501-7507), as amended by the Single Audit Act Amendments of 1996 (P.L. 104 to 156), the sub-grantee must have an annual audit conducted in accordance with OMB Circular A-133 if the sub-grantee expends more than $500,000 from federal awards. If the sub-grantee has expended more than $500,000 in federal dollars, a copy of the subrecipient's audit report for the previous fiscal year must be submitted to the Nevada Department of Public Safety for review within the earlier of 30 days after receipt of the auditor's report(s), or 13 months after the end of the audit period, unless a different period is specified in a program-specific audit guide. Unless restricted by law or regulation, the auditee shall make report copies available for public inspection.
   a. Required documentation for the performance of internal audits must be provided to the Division of Emergency Management (DEM) upon request within 30 days. Grant closeout is contingent upon the DEM audit and resolution of any discrepancies. Any non-submission of required internal audit documentation could result in the delay or non-payment of reimbursement requests, the deobligation of remaining Federal funds and/or jeopardize your eligibility to receive further Federal funding through DEM.
2. Sub-grantee's who expend less than the required $500,000 under the Federal Single Audit Act (31 U.S.C. par., 7501-7507), as amended by the Single Audit Act Amendments of 1996 (P.L. 104 to 156), which is incorporated into this agreement by reference, will provide to the State of Nevada Department of Public Safety uncertified financial statements, (financial statements without the opinion of an independent external auditor) including notes and a schedule of expenditures of federal awards for your fiscal year end, signed by the sub-grantee's executive management within the earlier of 30 days after receipt of the financial report(s), or nine months after the end of the reporting period.
3. Grant revenue and expenditure records and supporting documentation must be maintained and made available upon request to the DEM for desk review or onsite monitoring visit purposes.

II. FISCAL RESPONSIBILITY

1. Financial management must comply with the requirements of OMB Circular A-102 or 2 CFR, Part 215 (*A-110*), whichever is applicable to your organization, and which are incorporated into these assurances by reference.
2. All grant expenditures are to be reasonable and allowable in accordance with 2 CFR Part 220 (*A-87*), 2 CFR Part 225 (*A-122*) or 2 CFR Part 230 (*A-122*), whichever is applicable to your organization, and which are incorporated into these assurances by reference.
3. Payment made by the DEM to the sub-grantee shall be on a reimbursement basis only and is conditioned upon receipt of applicable, accurate and complete reimbursement and match supporting documentation to be submitted by the sub-grantee. All payments will be contingent upon receipt of all fiscal and

programmatic reports required of the sub-grantee under these assurances.

a. Supporting documentation shall include, but is not limited to invoices, documented program/project deliverables, travel claims, payment vouchers, payroll reports, staffing/volunteer timesheets, contracts, bid/procurement process documentation, lease agreements, agenda's, meeting attendance documentation, training documentation, After Action Reports (AAR), Authorized Equipment Lists (*AEL*), Central Contractor Registry (CCR), Excluded Parties Listing (*EPLS*) and must be cross referenced to approved budgets.

b. All equipment requested must be on the approved equipment list (*AEL*). The DEM will not reimburse for any equipment purchased which is not identified on the AEL list or is not on the approved Budget Detail Matrix.

4. The sub-grantee is aware of and shall comply with the cost-sharing requirements of the federal grant program (*if applicable*).

a. Match supporting documentation must be kept in the same manner as reimbursement supporting documentation for grant funds and meet the following criteria for costs to be eligible as match:

1. The costs must be allowable under the grant program.
2. The costs must be in compliance with all Federal requirements and regulations (*i.e., 44 CFR Part 13 and 2 CFR Part 215, Part 225, Part 230 and OMB Circular A-102 as applicable to your organization*).
3. The costs must be reasonable, allowable, allocable, and necessary.
4. The following documentation is required for third-party cash and in-kind contributions, but is not limited to: Record of donor; Dates of donation; Rates for staffing, equipment or usage, supplies, etc.; Amounts of donation; and Deposit slips for cash contributions. According to 44 CFR § 13.24, this documentation is to be held at the applicant and sub-applicant level.
5. Except as provided by Federal statute, a cost sharing or matching requirement may not be met by costs borne by another Federal grant or Federal funding.
6. The source of the match funds must be identified in the grant application.
7. Every item must be verifiable, i.e., tracked and documented.
8. Any claimed cost share expense can only be counted once.

5. Sub-grantees will comply with the FEMA/Grant Programs Directorate policy regarding the use of preparedness grant funding for sustainment costs. Grant funds may be used to cover only those maintenance agreements, user fees, and other sustainment costs provided during the grant performance period in which the device was purchased.

6. Sub-grantees may not use future year preparedness grant funding to pay for additional agreements and user fees. All ongoing expenses after the performance period has expired are the responsibility of the grantee/sub-grantee and will not be paid for with FEMA preparedness grant funding.

a. Sub-grantee's may use FEMA preparedness grant funding to pay for maintenance agreements, user fees, and other sustainment costs as long as:

1. The equipment was purchased with FEMA preparedness grant funding.
2. The sustainment costs fall within the performance period of the grant that was used to purchase the equipment.

b. Sustainment costs are eligible under the equipment category unless the

equipment is M&A related (grants management equipment).

III. FISCAL REPORTING RESPONSIBILITY

1. Quarterly financial reports with supporting documentation shall be submitted to the DEM within 30 days, but no later than 45 days following the close of each quarter of the sub-grant period. The final financial report must be submitted to the DEM no later than 60 days following the end of the sub-grant period. Late reports, unless approved by the DEM, could delay reimbursement or result in non-payment of the claim. All forms used for reporting are provided by the DEM. The submission of inaccurate or incomplete information with unapproved reporting documentation and/or templates will result in the rejection of the Quarterly report.

As applicable for grant programs, reports consist of, but are not limited to:

- **a.** Division of Emergency Management Quarterly Financial Report
- **b.** Quarterly Progress Summary
- **c.** Program Narrative
- **d.** Approved Detailed Budget (or approved Vulnerability Reduction Purchase Plan, VRPP)
- **e.** Quarterly Project Plan/Work Plan (*EMPG*).
- **f.** **Compliance with HSGP Directive 1.1, Reallocation/Redirect of the Homeland Security Grant Program (HSGP). Please see attached for the complete Directive.**

2. Sub-grantee understands that, except for extraordinary circumstances that will be handled on a case-by-case basis, requests to transfer funds between budget categories, or requests to purchase items not previously authorized will not be approved. Written approval must be obtained from the DEM prior to the transfer of funds between budget categories or the expenditure of funds for newly identified items. All requests must be submitted to the DEM on the approved Project Change Request form. The Project Change Request form must be accompanied by, but is not limited to, a Revised Budget Detail Matrix and written justification.

IV. FUNDS MANAGEMENT

1. The sub-grantee must maintain funds received under these assurances in separate ledger accounts and cannot mix these funds with other sources. The sub-grantee must manage funds according to applicable federal regulations for administrative requirements, costs principles and audits.

2. The sub-grantee must maintain adequate business systems to comply with Federal requirements. The business systems that must be maintained include, but are not limited to: Financial Management, Procurement, Personnel, Equipment, Property and Travel.

3. A system is adequate if it is 1) written; 2) consistently followed – it applies in all similar circumstances; and 3) consistently applied – it applies to all sources of funds.

V. PROGRAM RESPONSIBILITY

1. Quarterly program reports with supporting documentation shall be submitted to the DEM within 30 days, but no later than 45 days following the close of each quarter of the grant period. The final Program Report must be submitted to the DEM no later than 60 days following the end of the grant period. Late reports, unless approved by the DEM, could delay reimbursement. Late reports, unless approved by the DEM, could result in non-payment of the claim. All forms used for reporting are provided by the DEM. The submission of inaccurate or incomplete information and unapproved documentation will result in the rejection of the Quarterly final report.

As applicable for grant programs, reports consist of, but are not limited to:

- **a.** Division of Emergency Management Quarterly Financial Report
- **b.** Quarterly Progress Summary
- **c.** Program Narrative

d. Approved Detailed Budget
e. Quarterly Project Plan

2. A completed Project Plan form shall be submitted to DEM prior to issuance of any sub-grant.
   a. The project plan must clearly document all individual projects, milestones, tasks, deliverables and timelines, must support and be traceable to the approved Budget Detail Matrix and the federally approved Investment Justification.
   b. Late submission could result in delay of reimbursement, and failure to comply could result in non-payment of reimbursement claims.

3. The Program Narrative for exercises shall address the following required elements of the Nevada Exercise Program (*contact the DEM for the Nevada Exercise Program instructions if applicable to your program*):
   All training funded by DHS grants must be pre-approved by the State DEM Training Officer. Requests for the use of Homeland Security Grant Program (HSGP) funding in support of training programs/and or individual requests must be coordinated and approved by: Your local jurisdiction, your county (Emergency Manager) or designated Training Coordinator, the State Administrative Agency(SAA) Nevada Division of Emergency Management and the SAA Training Point of Contact (TPOC). The jurisdiction/ or individuals must obtain this approval prior to any commitment for any requested training utilizing Homeland Security funds. Detailed instruction and forms are attached.
   a. Annual participation in the Training and Exercise Plan Workshop (TEPW) to collaborate with all agencies in the development, planning and implementation of the Multi-Year Exercise and Training Plan (MYTEP) regarding training and exercise types, dates, locations, target capabilities, and/or Federal funding.
   b. Each county-level jurisdiction will identify a National Exercise Schedule (NEXS) point of contact that will serve as the Exercise Scheduler. The county-level Scheduler will be responsible for the submission of all required exercise information to the NEXS website. This requires approval by the State Exercise Officer.
   c. Electronic submission of the AAR/IP to the DEM within 60 days of the conduct of the exercise utilizing the DHS-approved format and process.
      1. One hard copy of the AAR/IP shall be submitted to the DEM Exercise Training Officer and one electronic copy of AAR/IP shall be submitted via the DHS Secure Portal in the Nevada Folder with an email notifying the State of Nevada Exercise Training Officer of the submission.

VI. EQUIPMENT MANAGEMENT

Effective control and accountability must be maintained for all equipment acquired with federal funds. The sub-grantee must adequately safeguard all such equipment and must assure that it is used solely for authorized purposes as described in the guidance. The sub-grantee will use, manage, and dispose of such property in accordance with 44 CFR Part § 13.32.

1. As required by 44 CFR Ch I, § 13.32 Equipment, the Division of Emergency Management, for compliance monitoring purposes as policy for all state agency sub-grantees equipment/asset management internal controls/policies and procedures will follow the regulatory compliance of the Nevada SAM 1544.0, NRS 354.625 and NRS 333.220, which applies a state mandated $1,000.00 per unit threshold.

2. As required by 44 CFR Ch I, § 13.32 Equipment, all other Local, Indian Tribal Governments, higher education, hospitals, and other non-profit sub-grantees for compliance monitoring purposes as policy will follow the regulatory compliance of 44 CFR Ch I, § 13.32 which applies a federally mandated $5,000.00 per unit threshold.

3. Accurate records maintained on all acquisitions and dispositions of property acquired

with Federal awards.

4. Federally funded equipment records must contain description (including serial number or other identification number), source, who holds title, acquisition date and cost, percentage of Federal participation in the cost, location, condition, and disposition data.
5. Property tags are placed on equipment.
6. At a minimum, a physical inventory of the Federally funded property must be taken and reconciled with the property records at least once every two years in accordance with 44 CFR Part § 13 or by jurisdictional regulation or guidance.
7. Procedures established to ensure that the Federal awarding agency is appropriately reimbursed for dispositions of property acquired with Federal awards.
   a. When the equipment is no longer needed, the grantee or sub-grantee will request disposition instructions from the Federal agency.
   b. Items of equipment with a current per-unit fair market value of less than $5,000 may be retained, sold or otherwise disposed of with no further obligation to the federal awarding agency.
   c. Items of equipment with a current per unit fair market value in excess of $5,000 may be retained or sold and the federal awarding agency shall have a right to an amount calculated by multiplying the current market value or proceeds from sale by the federal awarding agency's share (*the Federal percentage of participation*) of the equipment.
8. Policies and procedures in place for responsibilities of recordkeeping and authorities for disposition.

VII. SUB-GRANTEE MONITORING

The sub-grantee agrees to participate in annual monitoring visits and to follow up and take corrective action on all identified non-conformances and observations with action which includes, but is not limited to; the submission and implementation of corrective action plans to the DEM.

1. The sub-grantee is responsible for follow-up and corrective action on all non-conformances and observations with action from the DEM.
2. The sub-grantee shall prepare a corrective action plan(s) for identified non-conformances and observations with action.
3. The sub-grantee will implement the approved corrective action plan(s) for non-conformances and observations with action.

VIII. OWNERSHIP OF INFORMATION, PRINTED AND PUBLISHED MATERIAL

1. Any publication, invention, patent, photograph, negative, book, drawing, record, document, or other material prepared by the sub-grantee in the performance of its obligations under this grant shall be the exclusive property of the State of Nevada and all such material shall be returned to the state upon completion or termination of this grant.
2. Whenever possible equipment, real property, Public Service Announcement's etc. should reflect, "made possible by the Nevada Department of Public Safety Division of Emergency Management and paid for by FEMA/DHS."

IX. INDEMNIFICATION

1. Sub-grantee agrees to indemnify, save and hold the state, its agents and employees harmless from any and all claims, causes of action or liability arising from the performance of this agreement by sub-grantee, its agents or employees.

X. CONFIDENTIALITY OF RECORDS

1. If this grant funds any form of written or visual material that identifies employees of the DEM, prior approval must be obtained from the DEM before publishing or finalization.

XI. ASSIGNMENT AND DELEGATION

1. The sub-grantee shall neither assign, transfer nor delegate any rights, obligations or duties under this Notice of Grant Award without prior approval of the DEM

XII. DEBARMENT CERTIFICATION

1. The sub-grantee agrees to comply with the Federal Debarment and Suspension regulations as outlined in the "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – Lower Tier Covered Transactions".

XIII. CONTRACTORS

1. The sub-grantee may enter into written contract(s) for products and/or services pertaining to its functions under the grant award in accordance with terms established in the State of Nevada procurement policy, OMB Circulars, the DHS Financial Management Guide, and the DHS Program Guides.
2. The sub-grantee agrees and understands that no contract that the sub-grantee enters into with respect to performance under the grant award shall in any way relieve the sub-grantee of any responsibilities for performance if its duties.

XIV. NATIONAL INCIDENT MANAGEMENT MANAGMENT SYSTEM (NIMS)

1. The Department of Homeland Security released the National Incident Management System (NIMS) as required by Homeland Security Presidential Directive (HSPD) 8 Management of Domestic Incidents and Preparedness. HSPD-5 established and designated the National Integration Center (NIC) Incident Management Systems Division as the lead federal entity to coordinate NIMS compliance.
2. To be eligible to receive grant funding, applicants must meet NIMS compliance requirements. State, Territory, Tribal, and local governments are considered to be in full NIMS compliance if they have adopted and/or implemented compliance activities, as determined by the National Incident Management System Capability Assessment Support Tool (NIMSCAST) or other accepted means. Additional information on achieving compliance is available at http://www.fema.gov/emergency/nims/

XV. APPLICABLE FEDERAL REGULATIONS

The sub-grantee must comply with the Office of Management and Budget (*OMB)* Circulars and other federal guidance including but not limited to:

1. Grant Program Guidance issued by the U.S. Department of Homeland Security, at http://www.fema.gov/government/grant/index.shtm
2. OMB Circular A-133, Audits of States, Local Governments, and Non-Profit Organizations, at http://www.whitehouse.gov/omb/circulars_a133/
3. OMB Circular A-102, Grants and Cooperative Agreements with State and Local Governments, at http://www.whitehouse.gov/omb/circulars_a102/
4. 2 CFR, Part 215, Uniform administrative requirements for grants and agreements with institutions of higher education, hospitals, and other non-profit organizations (*OMB A–110*), at http://www.whitehouse.gov/omb/assets/omb/circulars/a110/2cfr215-0.pdf
5. 2 CFR Part 220, Cost Principles for Educational Institutions (*OMB A-21*), at http://www.whitehouse.gov/omb/assets/omb/fedreg/2005/083105_a21.pdf
6. 2 CFR Part 225, Cost Principles for State, Local, and Indian Tribal Governments (*OMB A–87*), at http://www.whitehouse.gov/omb/assets/omb/fedreg/2005/083105_a87.pdf
7. 2 CFR Part 230, Cost Principles for Non-Profit Organizations (*OMB A–122*), at http://www.whitehouse.gov/omb/assets/omb/fedreg/2005/083105_a122.pdf
8. 44 CFR Part 13, Emergency Management and Assistance, at http://www.access.gpo.gov/nara/cfr/waisidx_08/44cfr13_08.html
9. U.S. Department of Homeland Security Authorized Equipment List (AEL) available at https://www.rkb.us/mel.cfm?subtypeid=549

XVI. TERMINATION

The DEM retains the right to terminate this sub-grant, for cause, at any time before completion of

the grant period when it has determined that the sub-grantee has failed to comply with the conditions of these assurances.

1. The DEM reserves the right to terminate the grant in whole or in part due to the failure of the sub-grantee to comply with any term or condition of the signed and agreed upon assurances, failure to communicate with or respond to any State Administrative Agency (SAA) request or communication, to acquire and maintain all required insurance policies, bonds, licenses, permits and certifications or to make satisfactory progress in performing the program, financial and administrative requirements of the grant.
2. The DEM staff shall provide written notice of the termination and the reasons for such actions to the sub-grantee.
3. If the subgrantee breaches the contract, DEM may, pursue any or all remedies available at law including return of any payments received.
4. Termination by the subgrantee shall be in writing with the approving authority signature and demonstrate the cause of termination as significant reduction in the subgrantee's a) fiscal; b) technical; and/or c) administrative capabilities. Termination is immediate upon DEM's receipt of notification, unless otherwise approved by DEM.

As the duly authorized representative of the applicant, I hereby certify that the applicant will comply with the above assurances and certifications.

NAME:_____ TITLE:_____

SIGNATURE:_____ DATE:_____

- Must be signed by the County Manager/Chief Financial Officer, the Tribal Chairman/designee or the state agency director as appropriate

Nevada Department of Public Safety
Division of Emergency Management

Notice of Interest

Due to NV SHMO – Thursday, August 1, 2013

Unified Hazard Mitigation Grant Program

PDM 2014

Project Name

Sponsoring Agency

For State Use Only		
Date Received	Application Type	Application Number

Attn: Elizabeth Ashby, eashby@dps.state.nv.us
Nevada Division of Emergency Management
2478 Fairview Drive, Carson City, Nevada 89701-6824
(775) 687-0314 phone | (775) 687-0323 fax
http://dem.state.nv.us;

Nevada Hazard Mitigation Planning Committee:
http://www.nbmg.unr.edu/nhmpc/nhmpc.htm

Part I: Contact Information

Primary Contact	Secondary Contact
Title	Title
Agency	Agency
Address	Address
City, County, State, Zip Code	City, County, State, Zip Code
Phone Number	Phone Number

Part II: Community Information

Applicant Type: City - Local Government

Project Address	Is this a small and impoverished community?
City, County, State, Zip Code	County Code
GPS Coordinates (Decimal Degrees)	FIPS Code
Datum (coordinates must be in either WGS 84, NAD 83, or NAD 27)	US Congressional District
DUNS Number	State Legislative District(s)

Part II: Community Information, continued

Mitigation Plan Information

Does your state have a FEMA-approved multi-hazard mitigation plan?

Yes

Is your agency and/or project location covered by a FEMA-approved hazard mitigation plan? *(An approved mitigation plan is required in order to receive funding through this grant program.)*

The City of Reno Local Hazard Mitigation Plan

What is the name of the plan?

6/3/2005

When was the plan approved?

Single

Is this plan a single or multi-jurisdictional plan?

Update in process

If the plan is not yet approved, when do you expect approval?

Use the space below to identify the goal(s), objective(s), and action(s) this project relates to in the plan:

W7 Encourage implementation of wildfire mitigation activities in a manner consistent with the goals of promoting sustainable ecological management and community stability.

Ideas for Implementation:

W7.1 Employ mechanical thinning and prescribed burning to abate the risk of catastrophic fire and restore the more natural regime of high frequency, low-intensity burns. Prescribed burning can provide benefit to ecosystems by thinning hazardous vegetation and restoring ecological diversity to areas homogenized by invasive plants; and

W7.2 Clear trimmings, trees, brush, and other debris completely from sites when performing routine maintenance and landscaping to reduce fire risk.

Part III: Hazard Information

What hazard(s) will this project mitigate? Indicate the frequency and severity of each.						
Hazard	Frequency			Severity		
	Low	Medium	High	Low	Medium	High
	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐

Problem that the activity intends to mitigate:

Part IV: Financial

Funding

Project Cost	Annual Maintenance Cost	Proposed Federal Share ($ and %)	Proposed Non-Federal Share ($ and %)
		75%	25%

Matching Non-Federal Funds

Match Share Source	Source Agency Name	Funding Type	Amount	Date Available
Use the space below to add any pertinent details not accounted for above.				

Be sure to include a letter that indicates the date the funds are available to be committed.

Part V: Project Information

Scope of Work

Describe the project, including what it entails and how it will address the problem being mitigated and how people and property at stake will be protected. (what, when, where, how, who)

Part V: Project Information, Continued

Estimated Project Timeline

Phase	Duration	Itemized Action List
Total		*Duration must be in days (not more than 1,096 days)

Be sure to attach all relevant estimates and drawings.

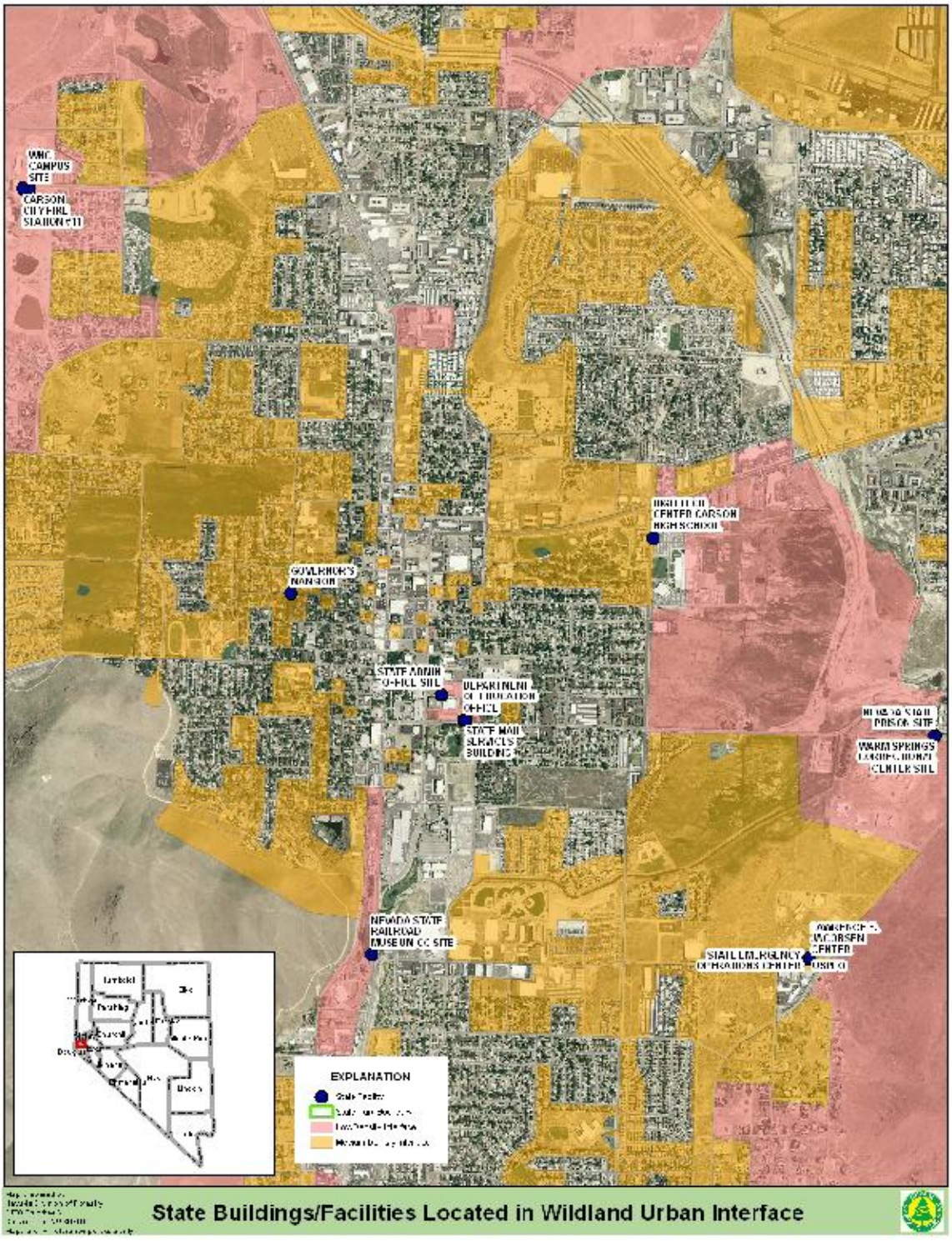
Attachments

Check the box next to each article that has been included with this application:

- ☐ Estimates
- ☐ Maps or Photos
- ☐ Funds Commitment Letter

APPENDIX J

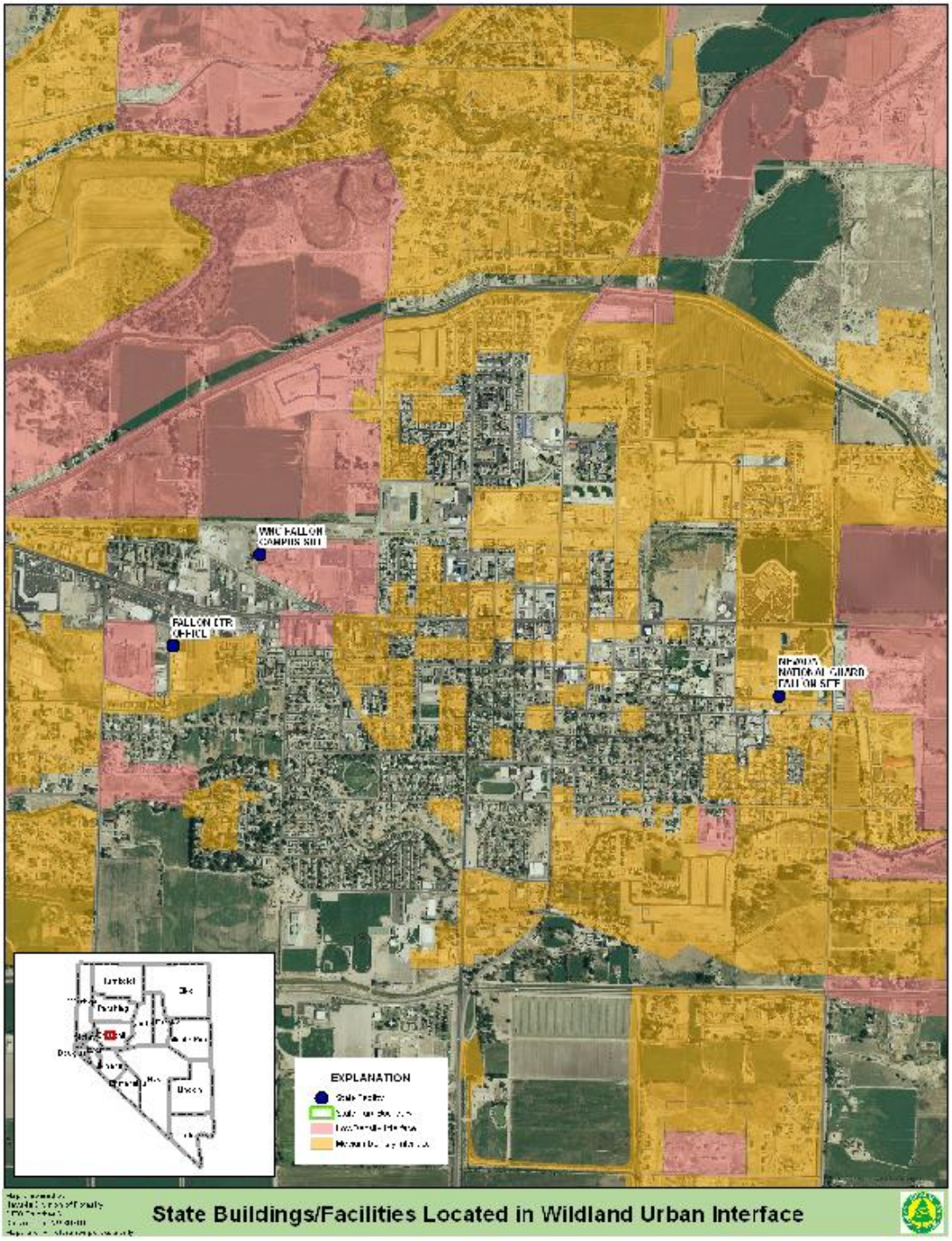
Wildfire & State Owned Buildings



Carson City

APPENDIX J

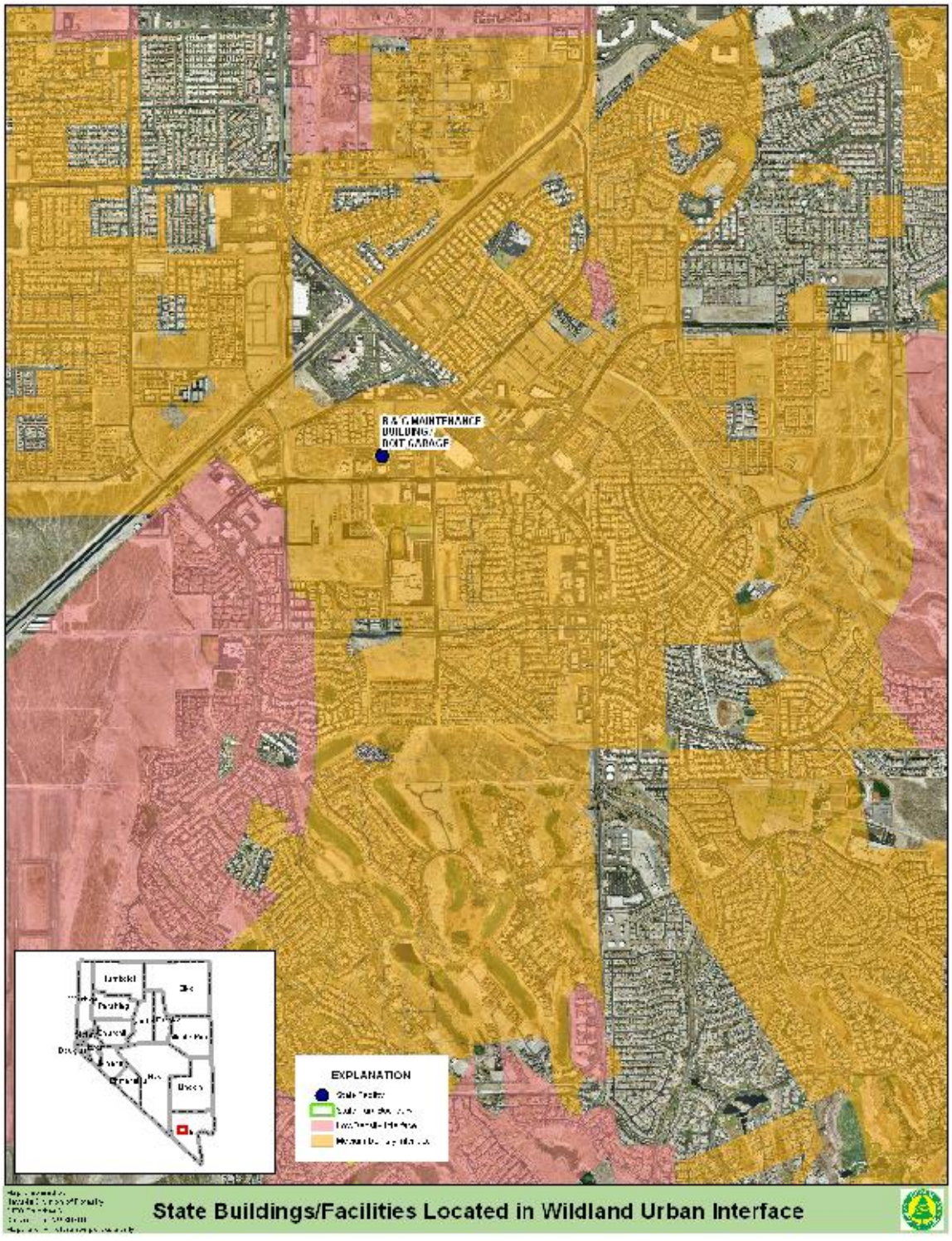
Wildfire & State Owned Buildings



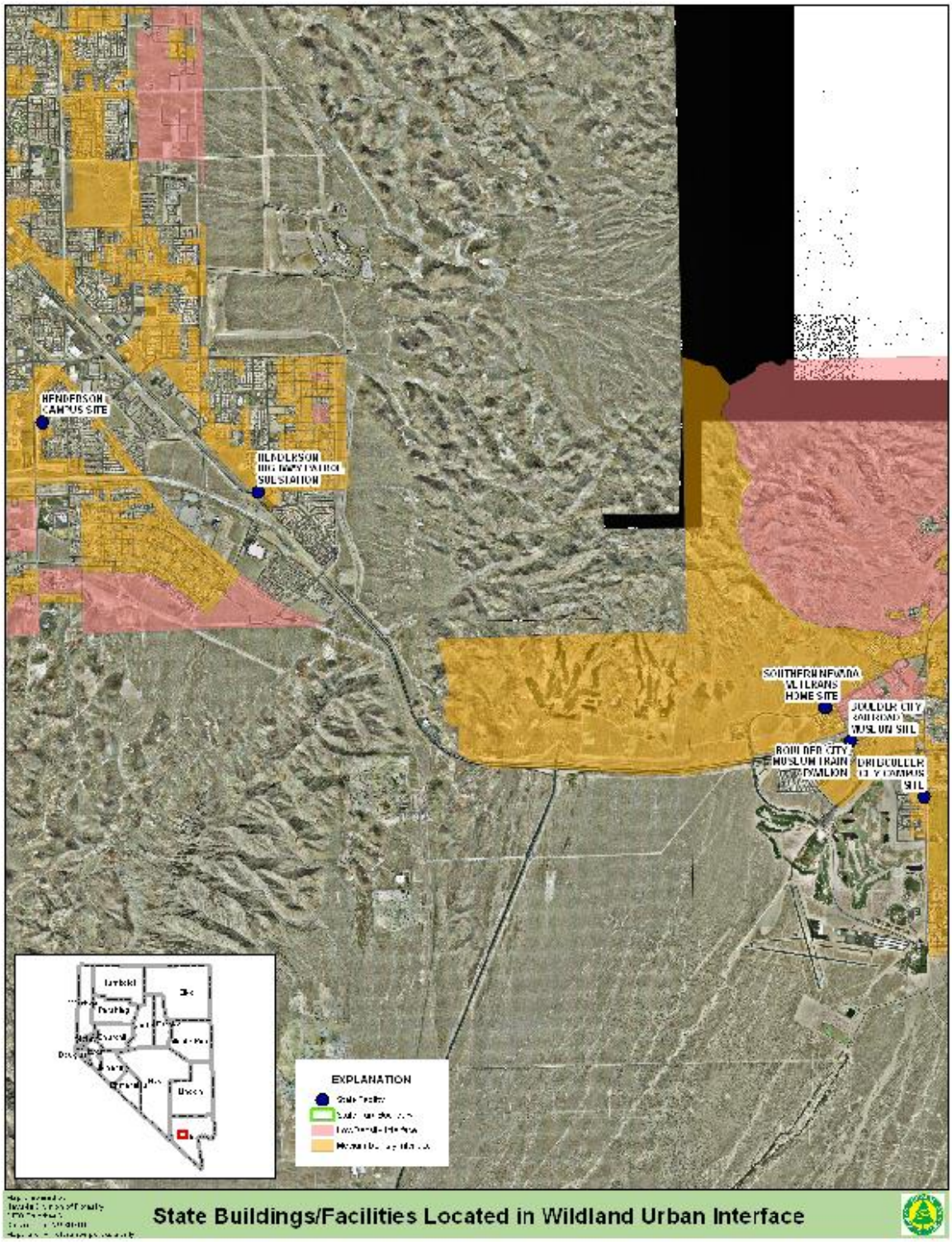
Churchill County – City of Fallon

APPENDIX J

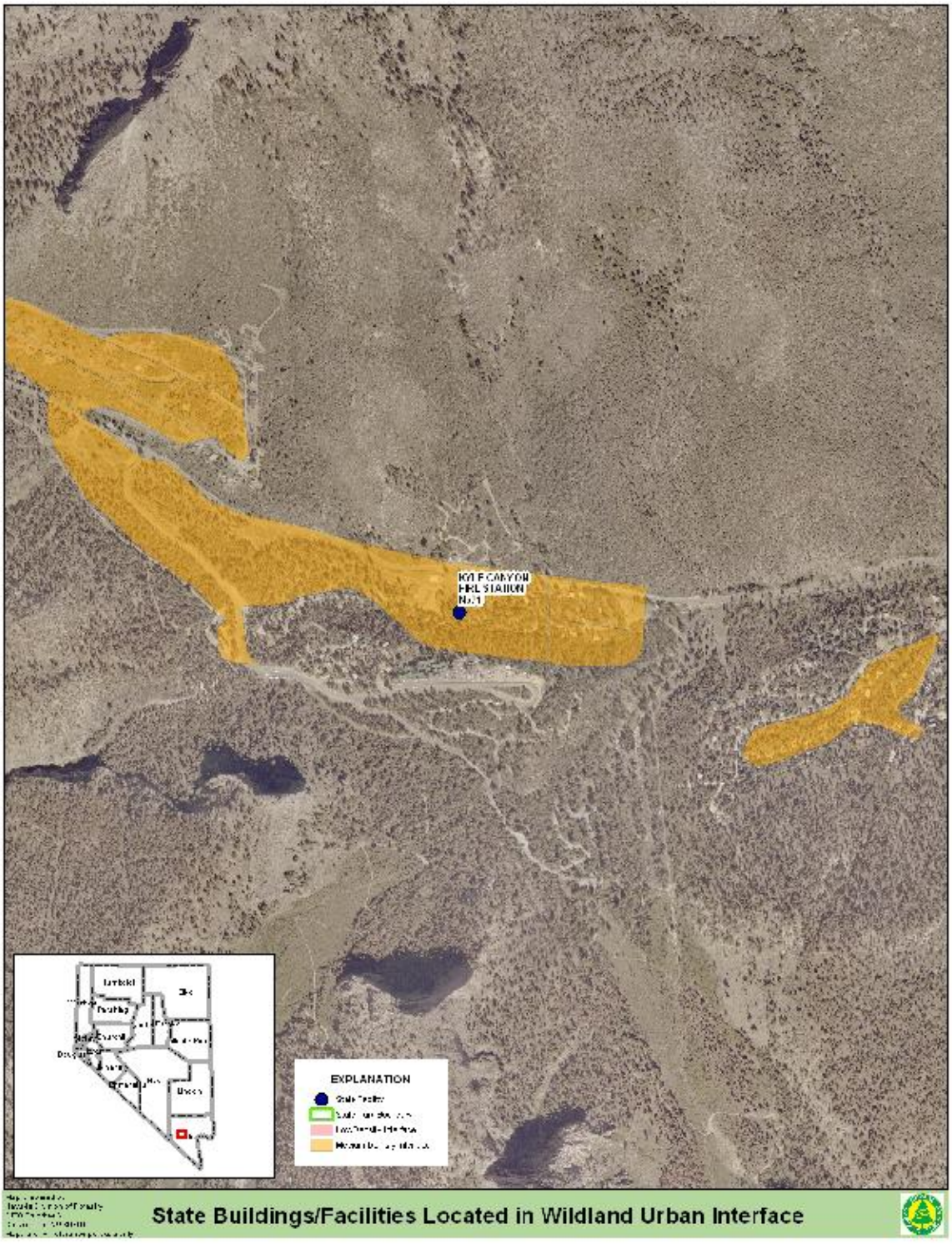
Wildfire & State Owned Buildings



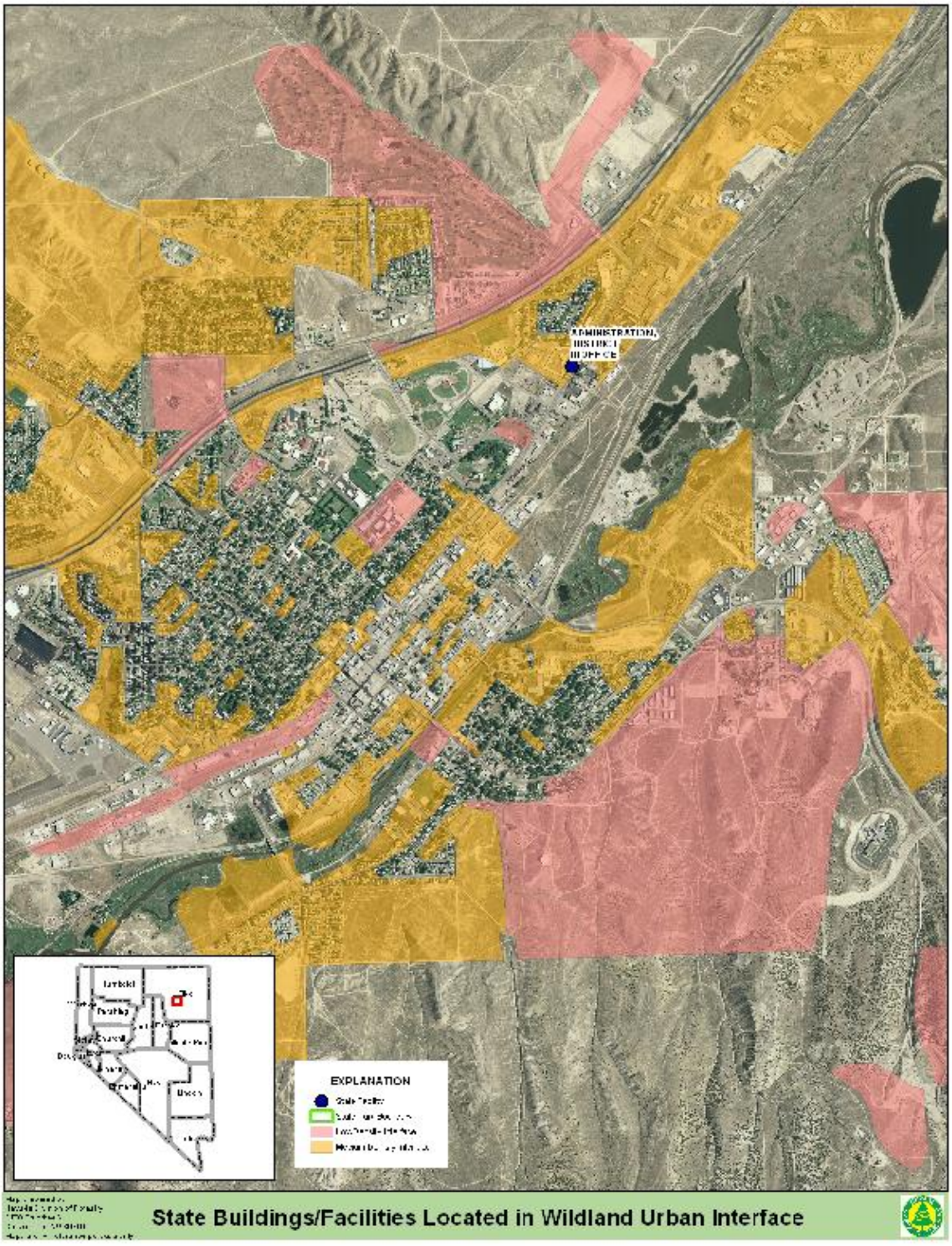
Clark County and City of Henderson



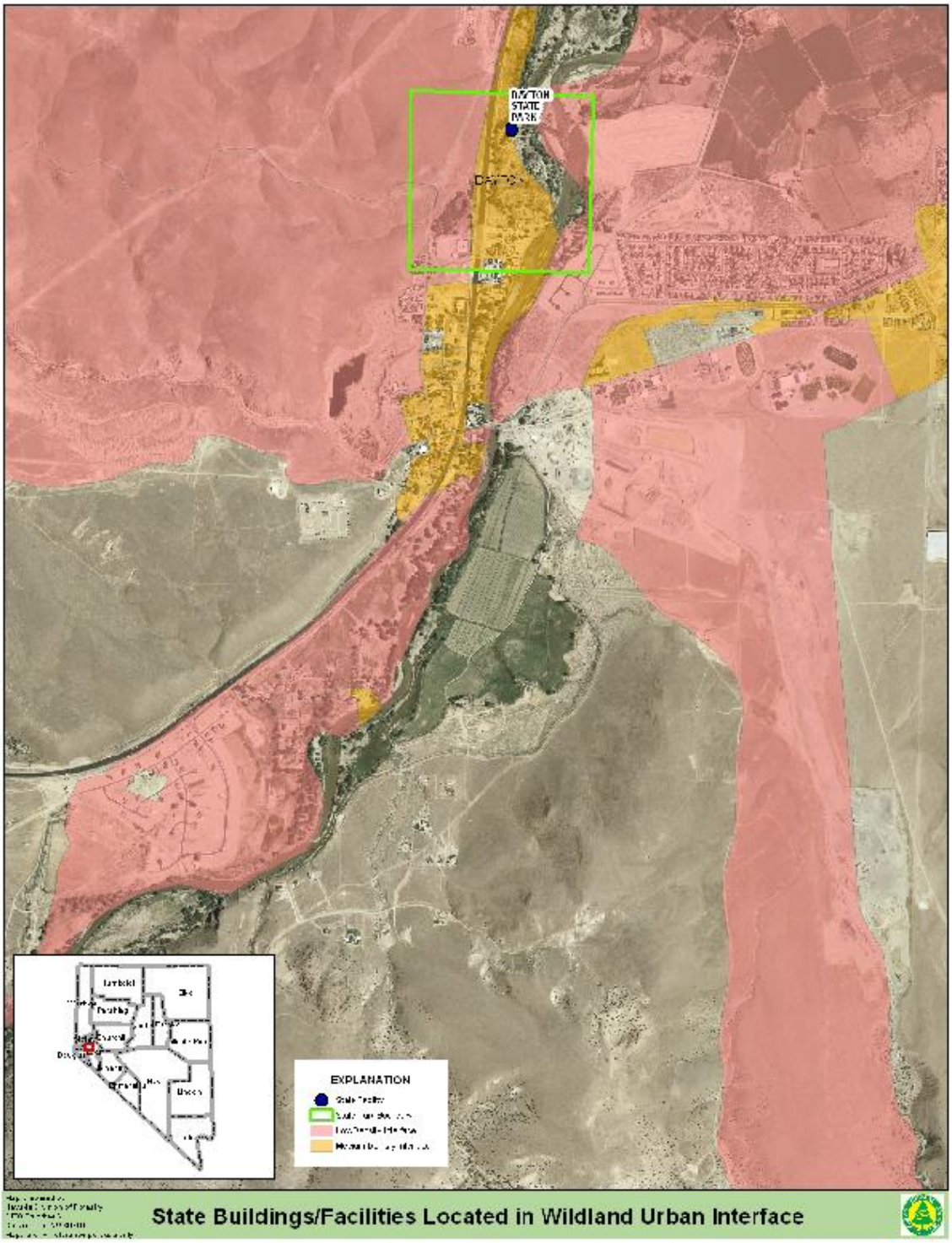
Clark County, City of Henderson, and Boulder City



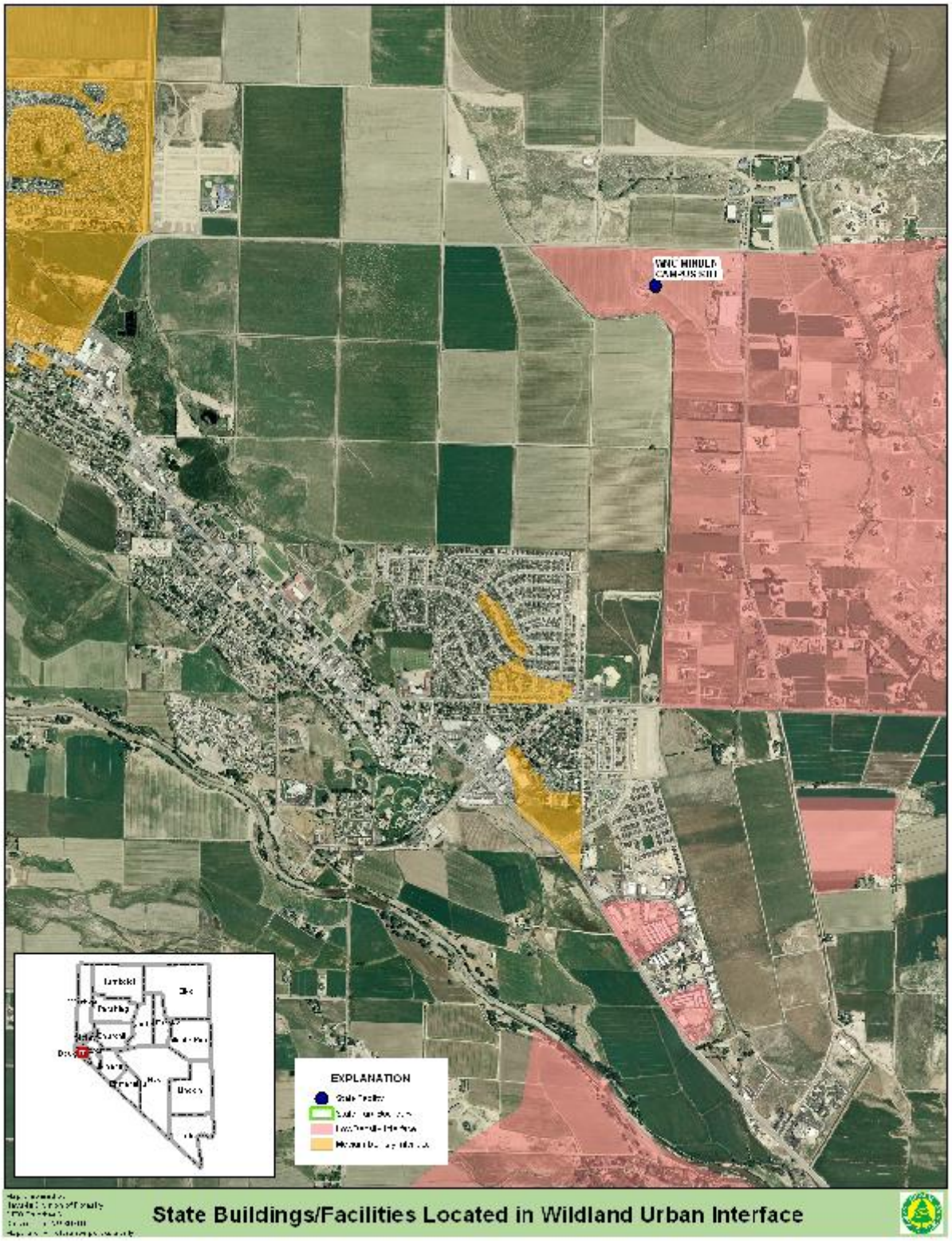
Clark County – Mt. Charleston



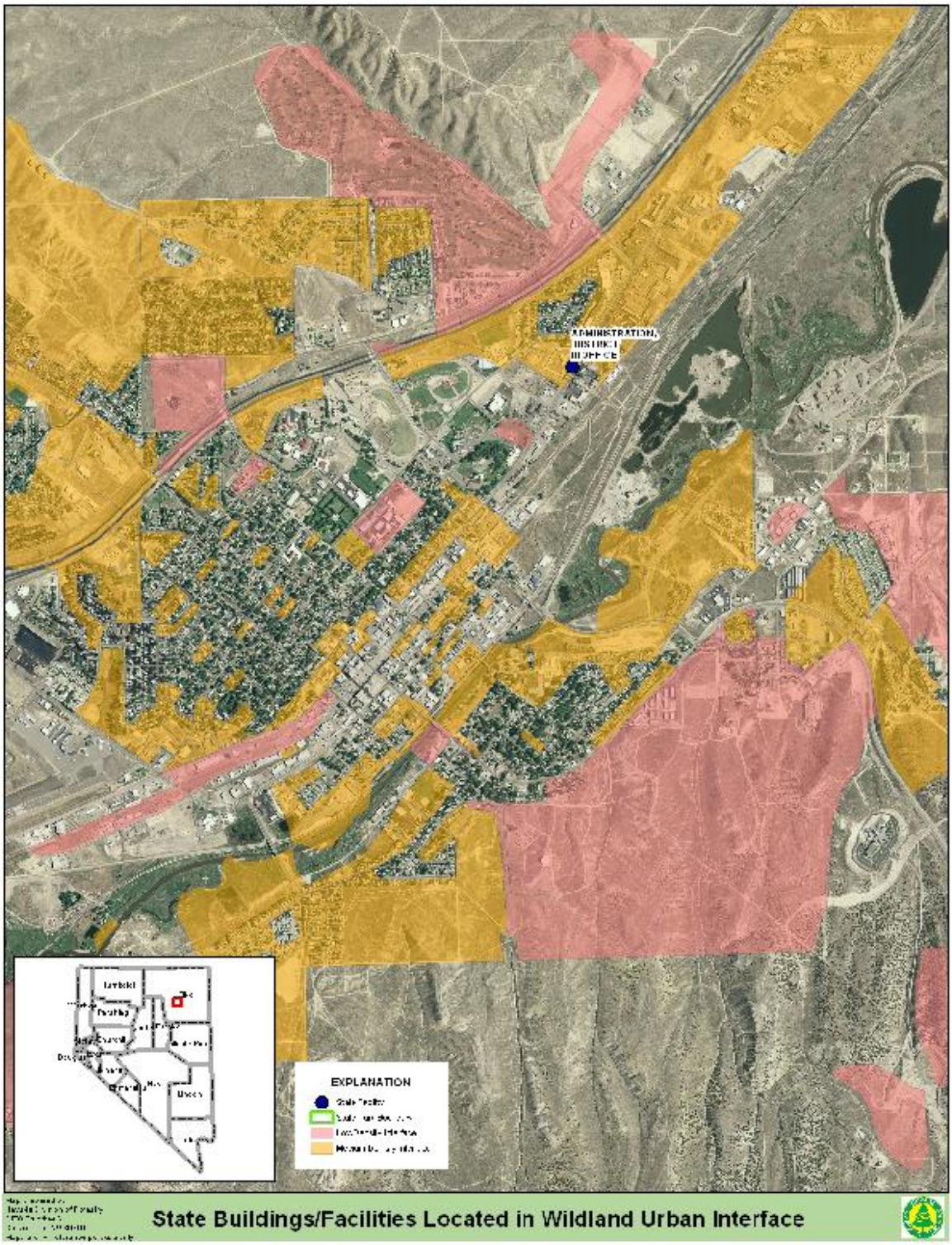
Elko County – City of Elko



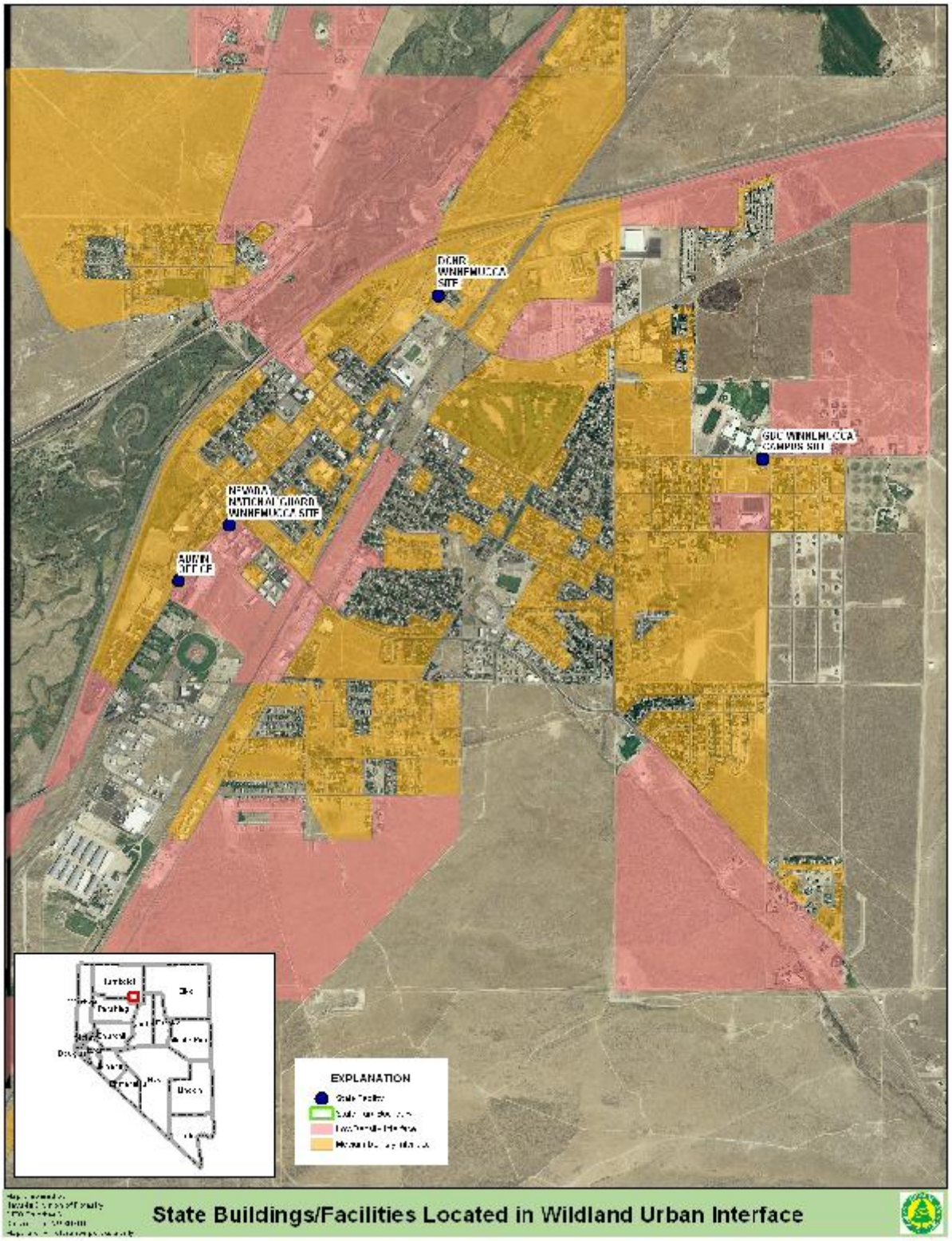
Lyon County – Town of Dayton



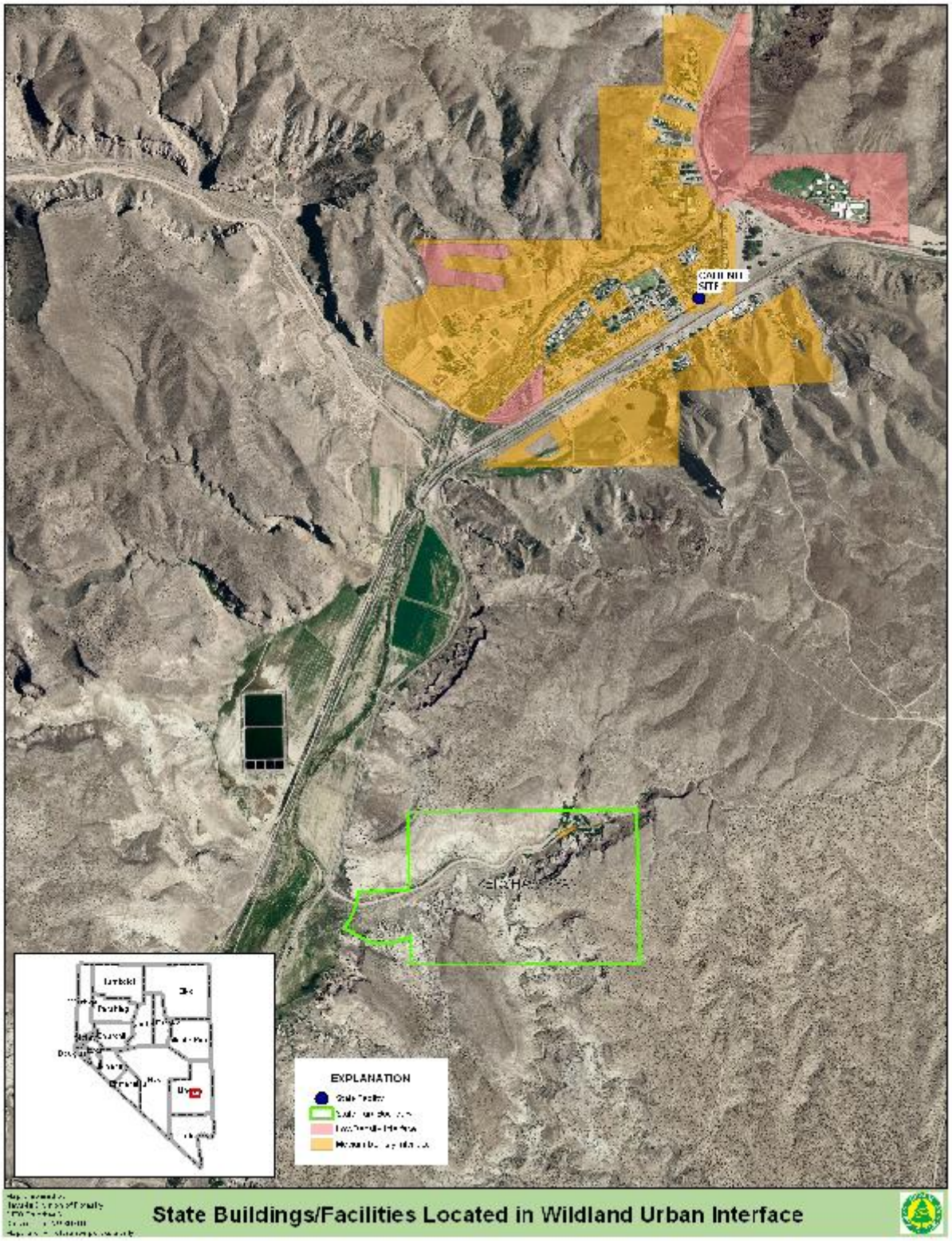
Douglas County – Towns of Minden and Gardnerville



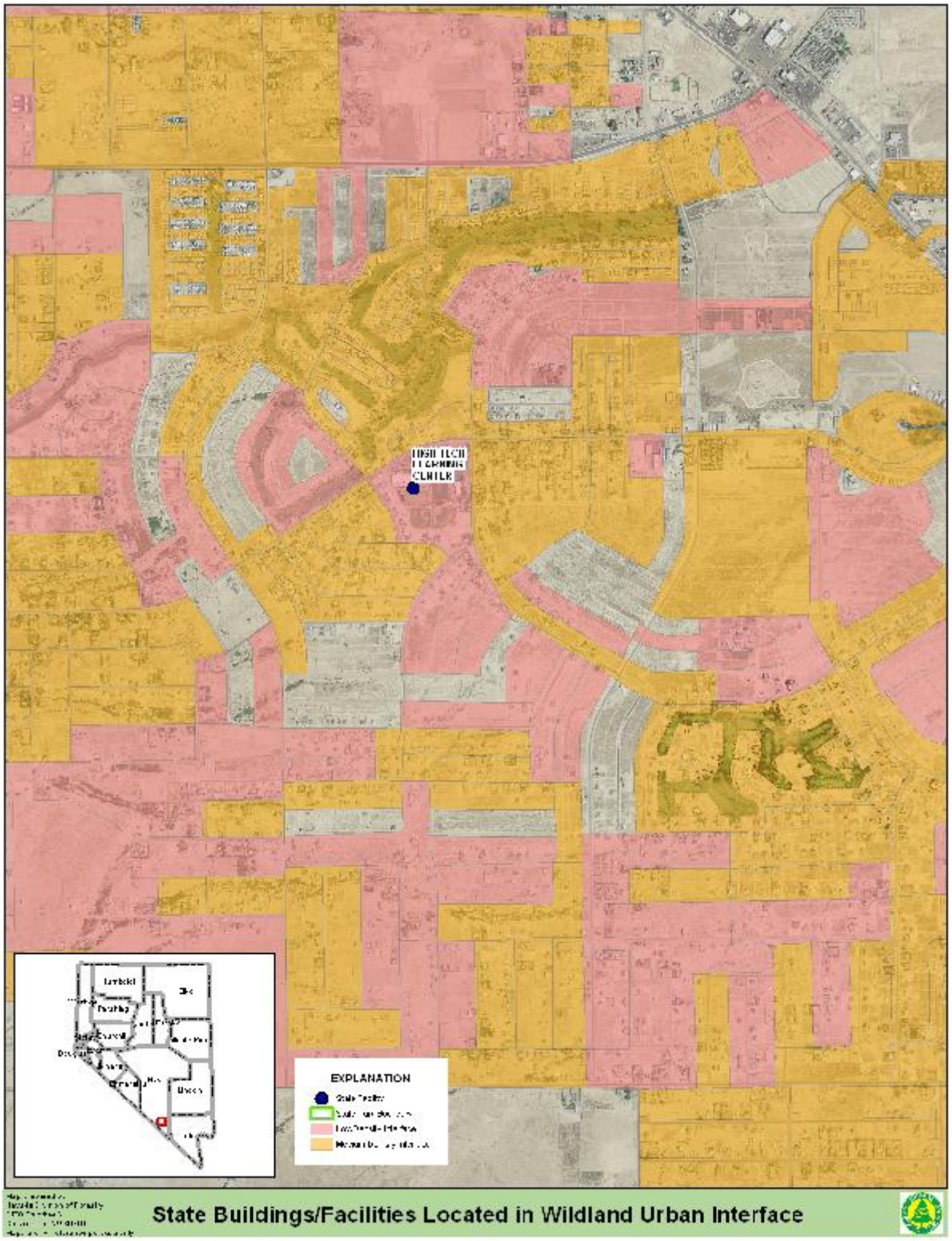
Elko County – City of Elko



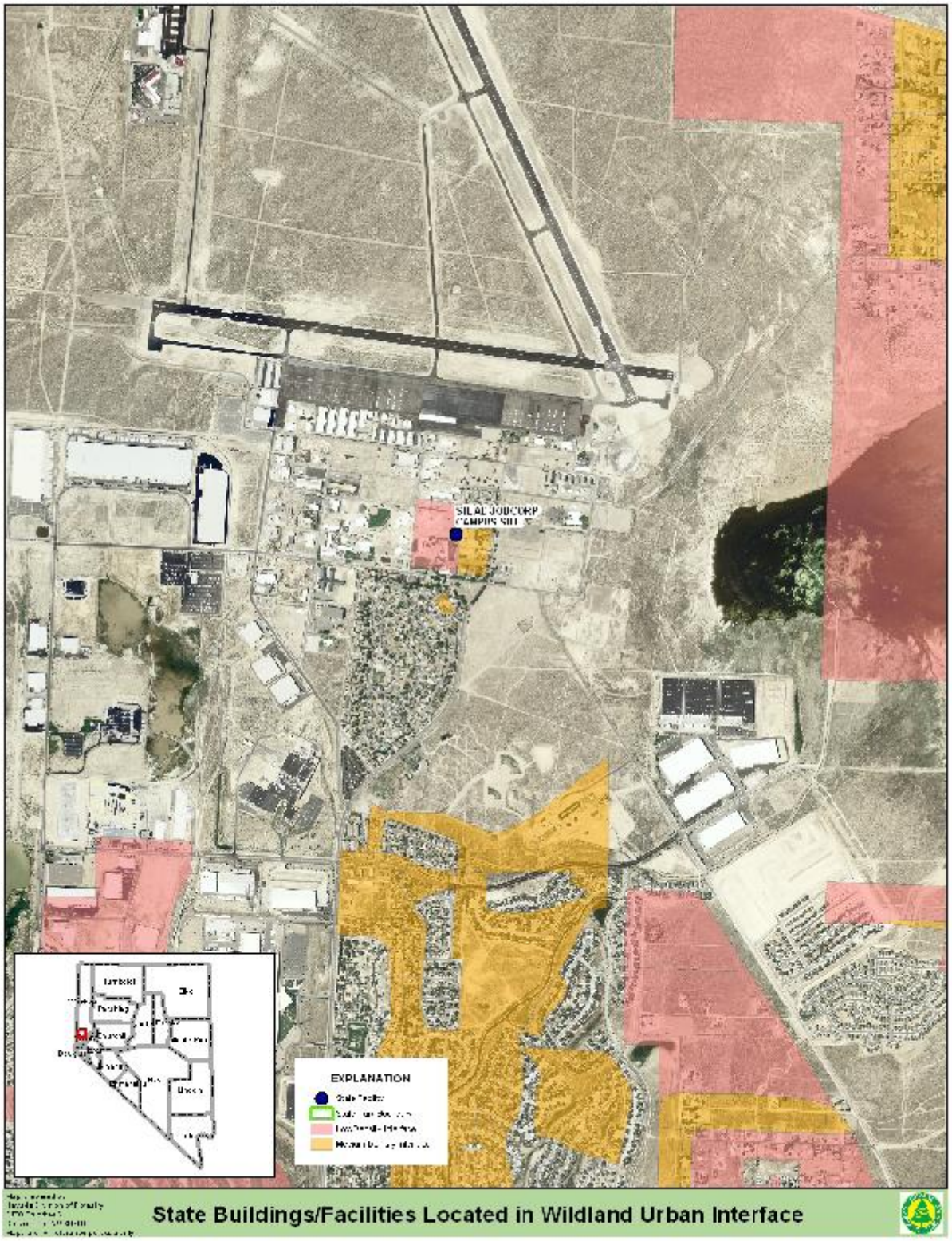
Humboldt County – City of Winnemucca



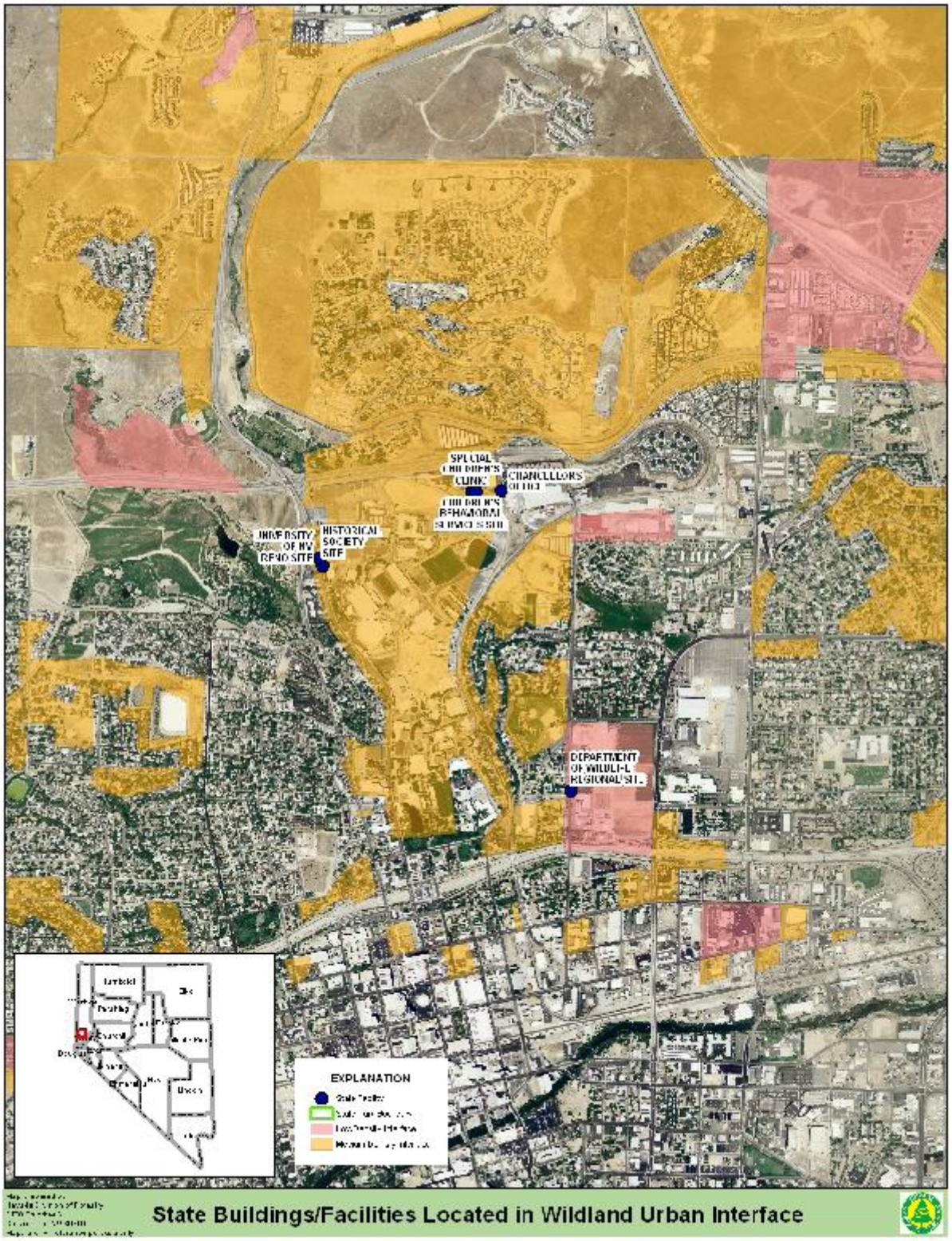
Lincoln County – City of Caliente



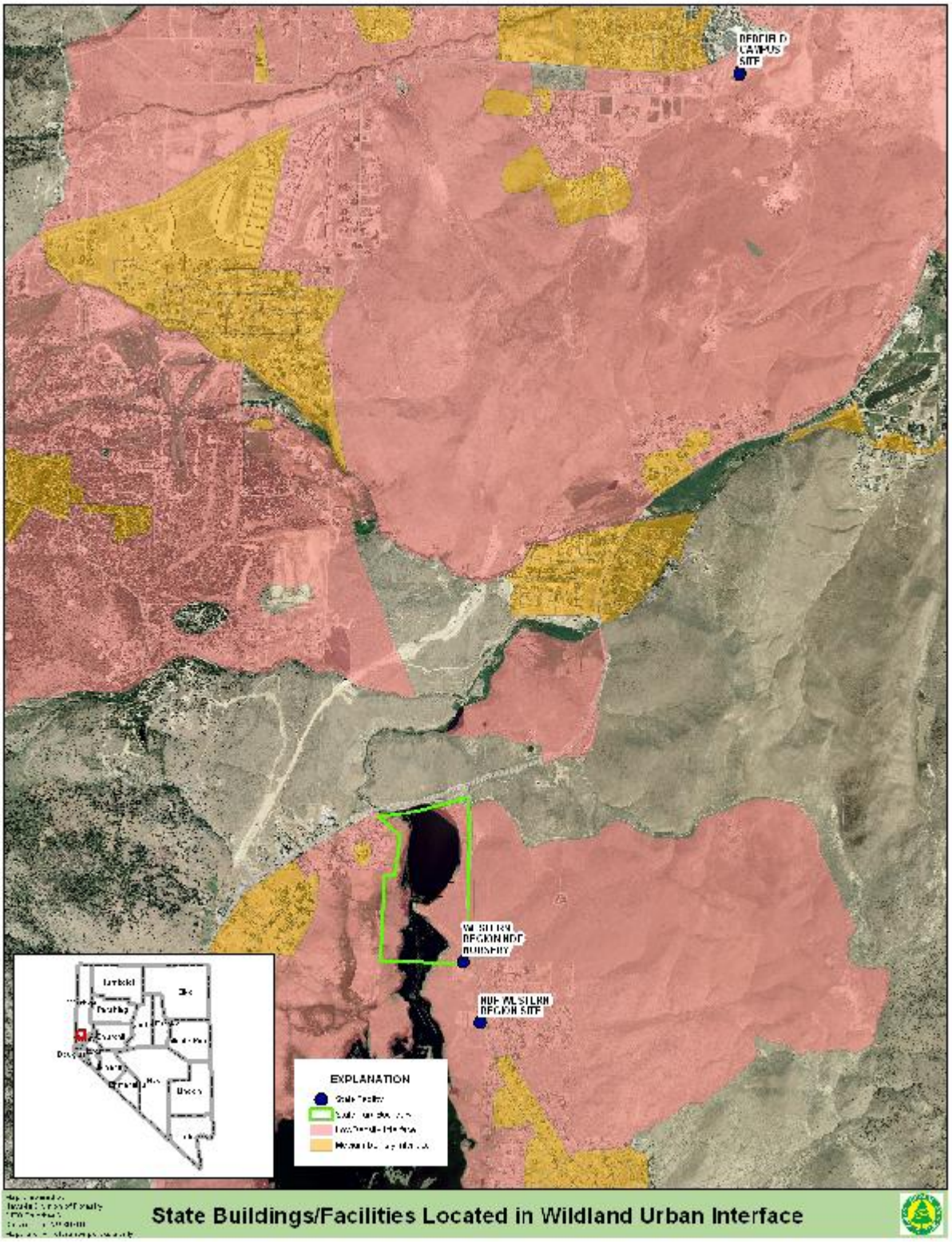
Nye County – Tonopah



Washoe County – Stead area

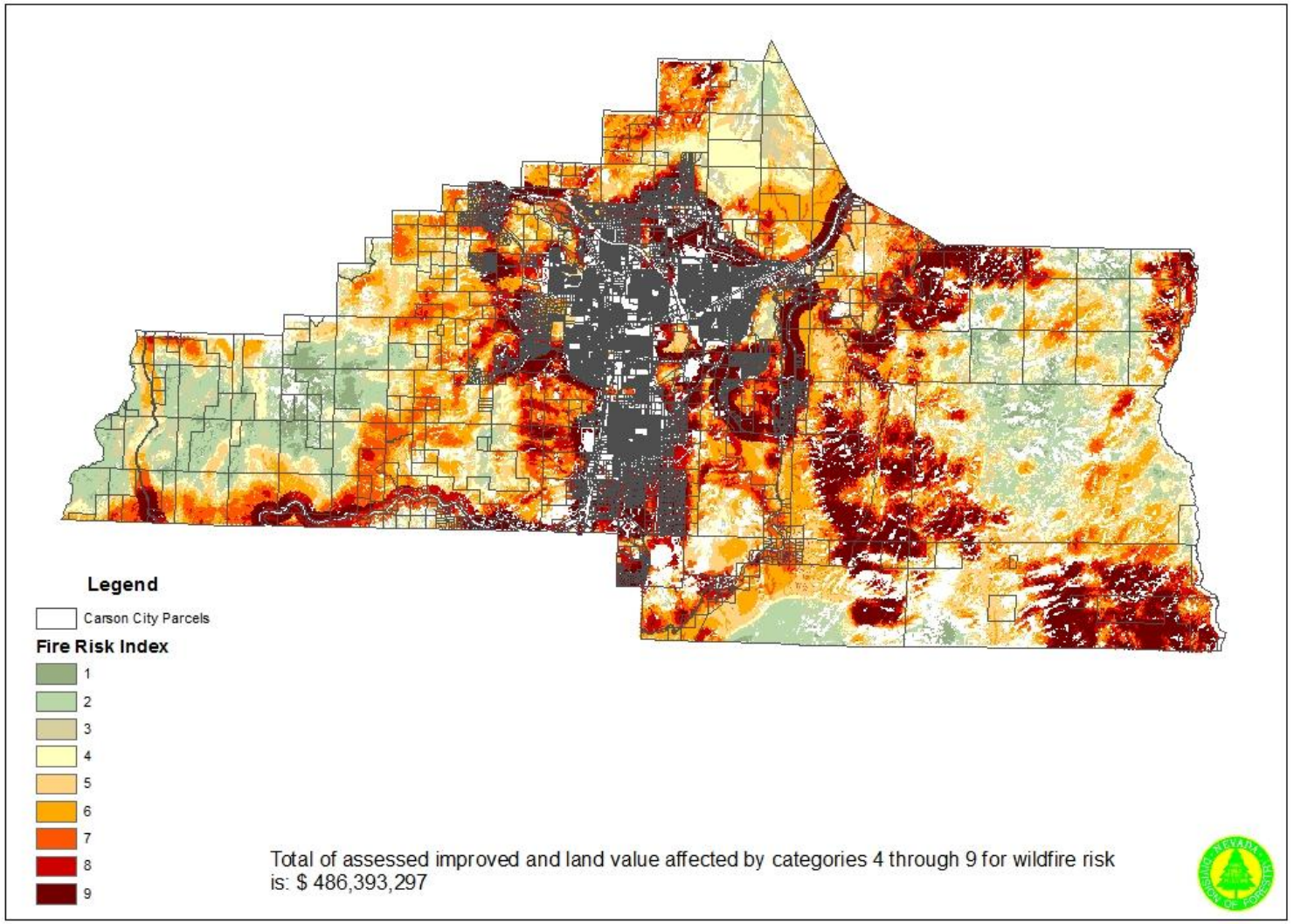


Washoe County – City of Reno/University of Nevada Reno

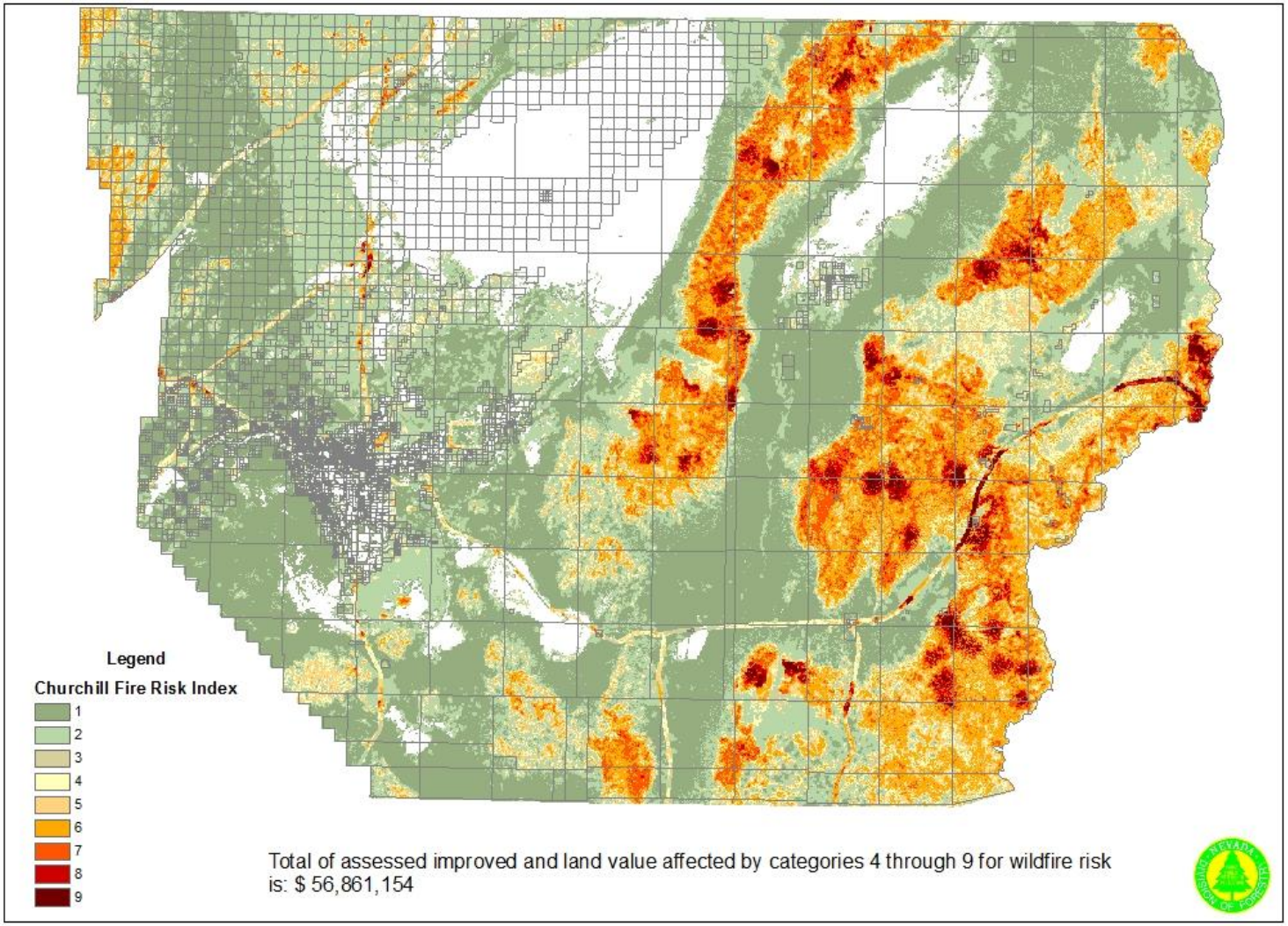


Washoe County – Washoe Valley

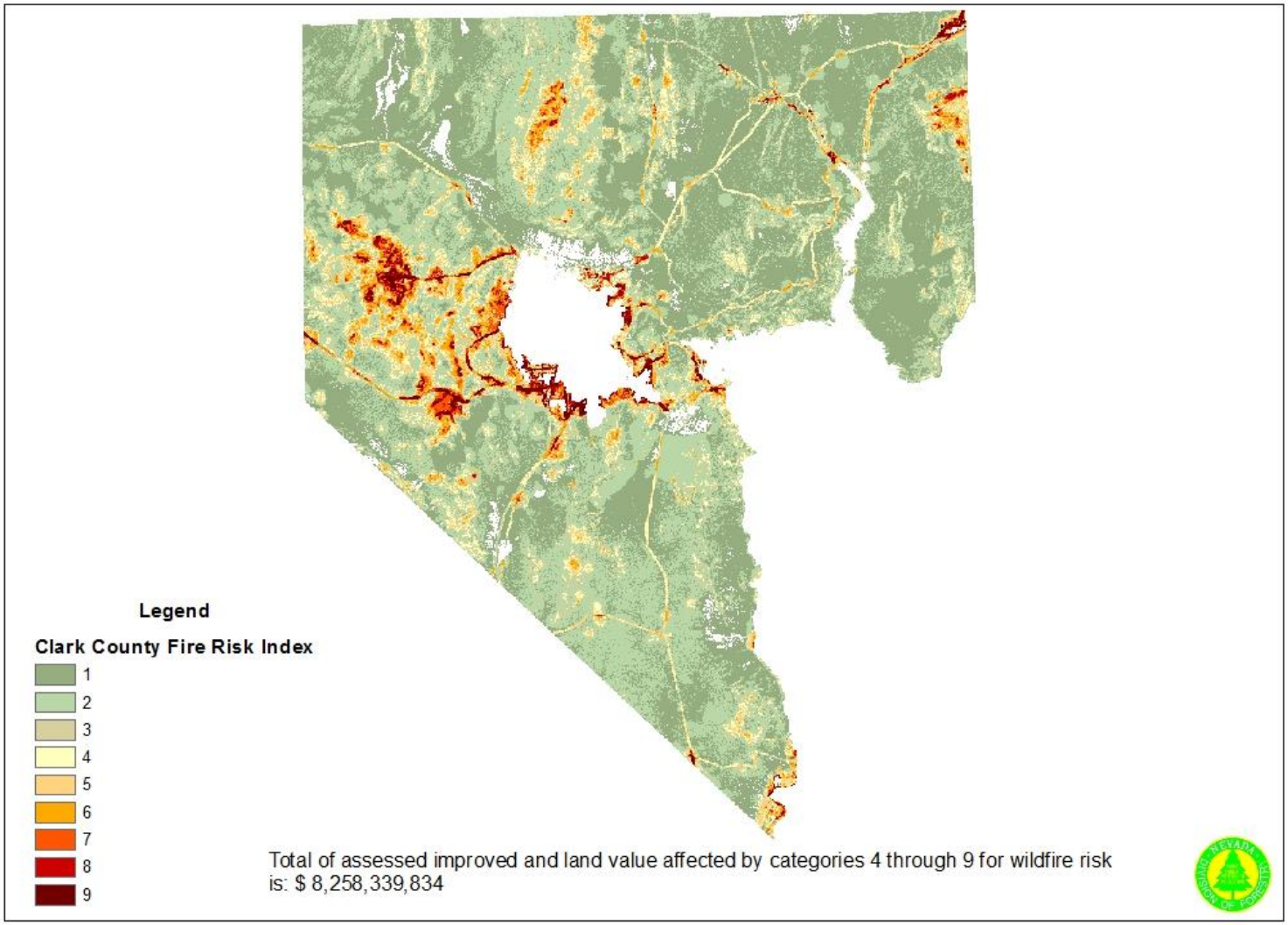
Carson City Wildfire Hazard Mitigation Map



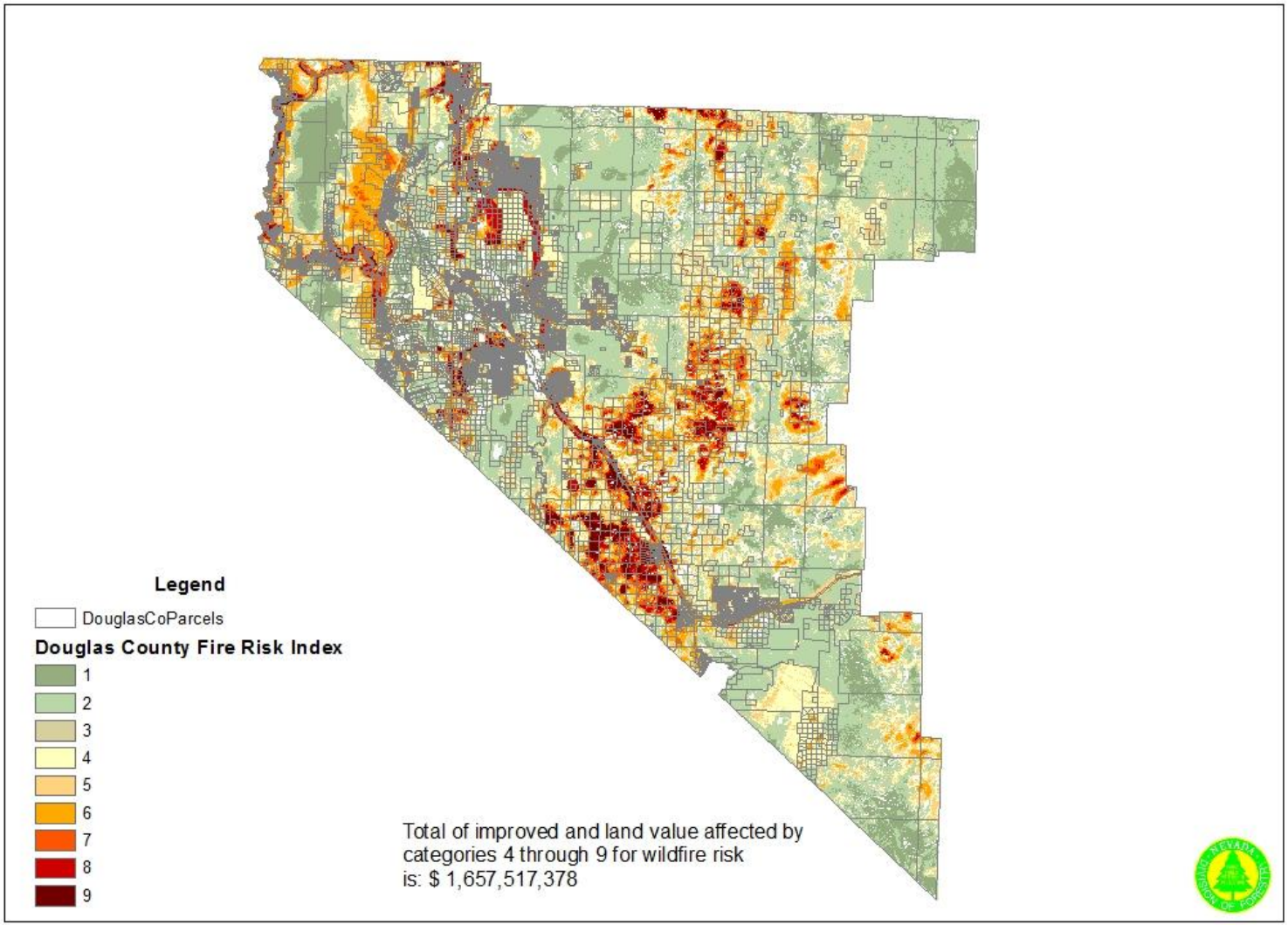
Churchill County Wildfire Hazard Mitigation



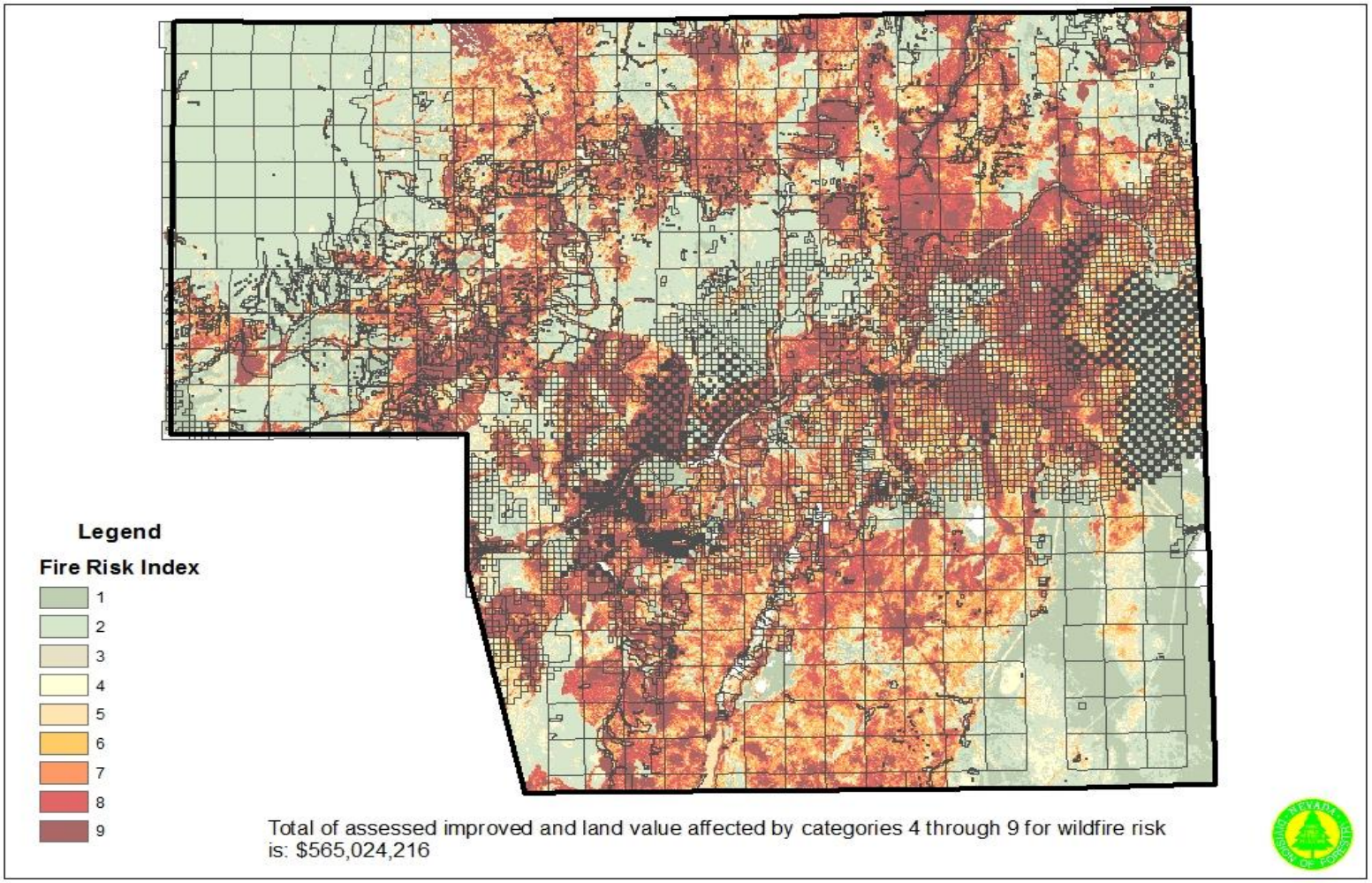
Clark County Wildfire Hazard Mitigation



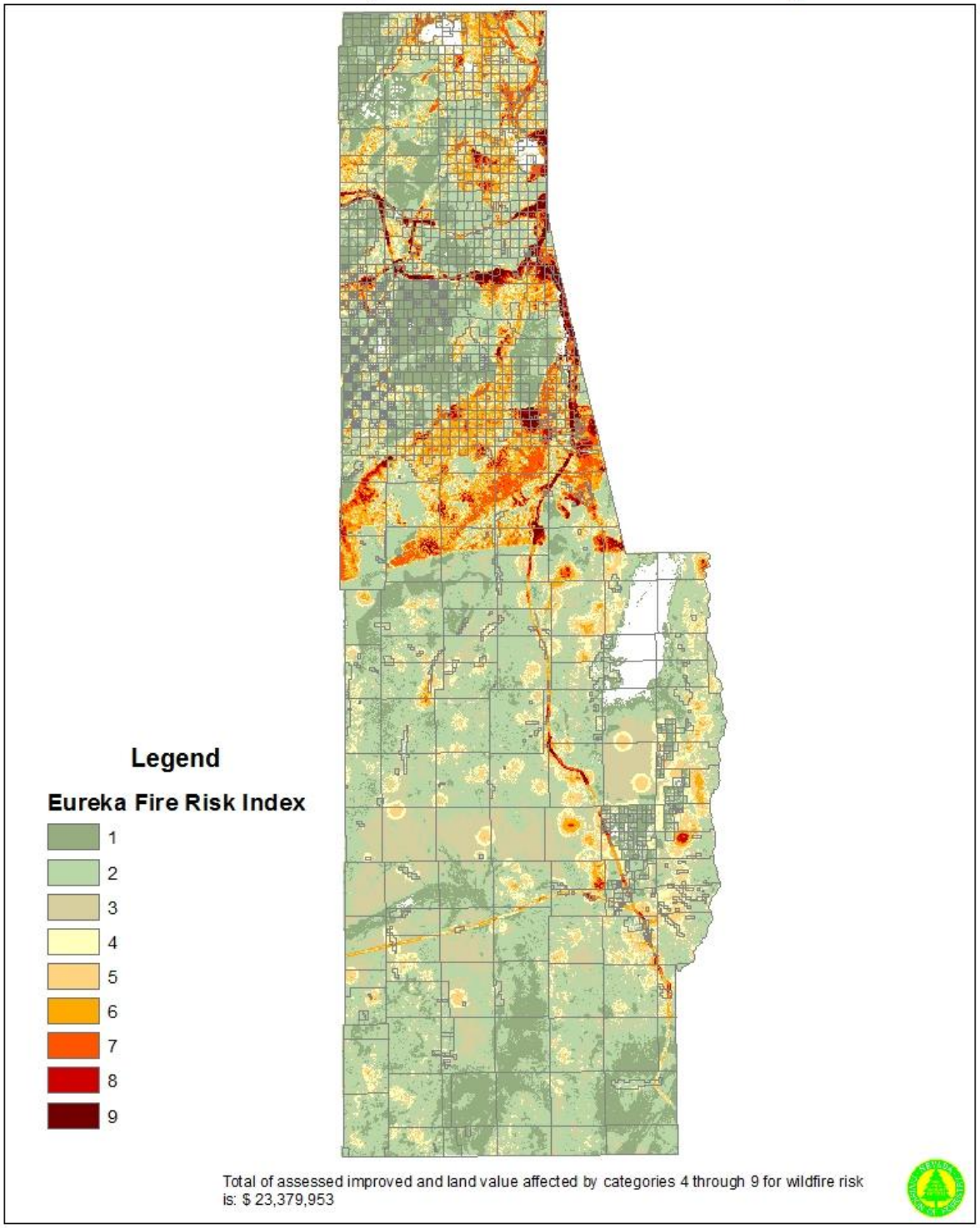
Douglas County Wildfire Hazard Mitigation



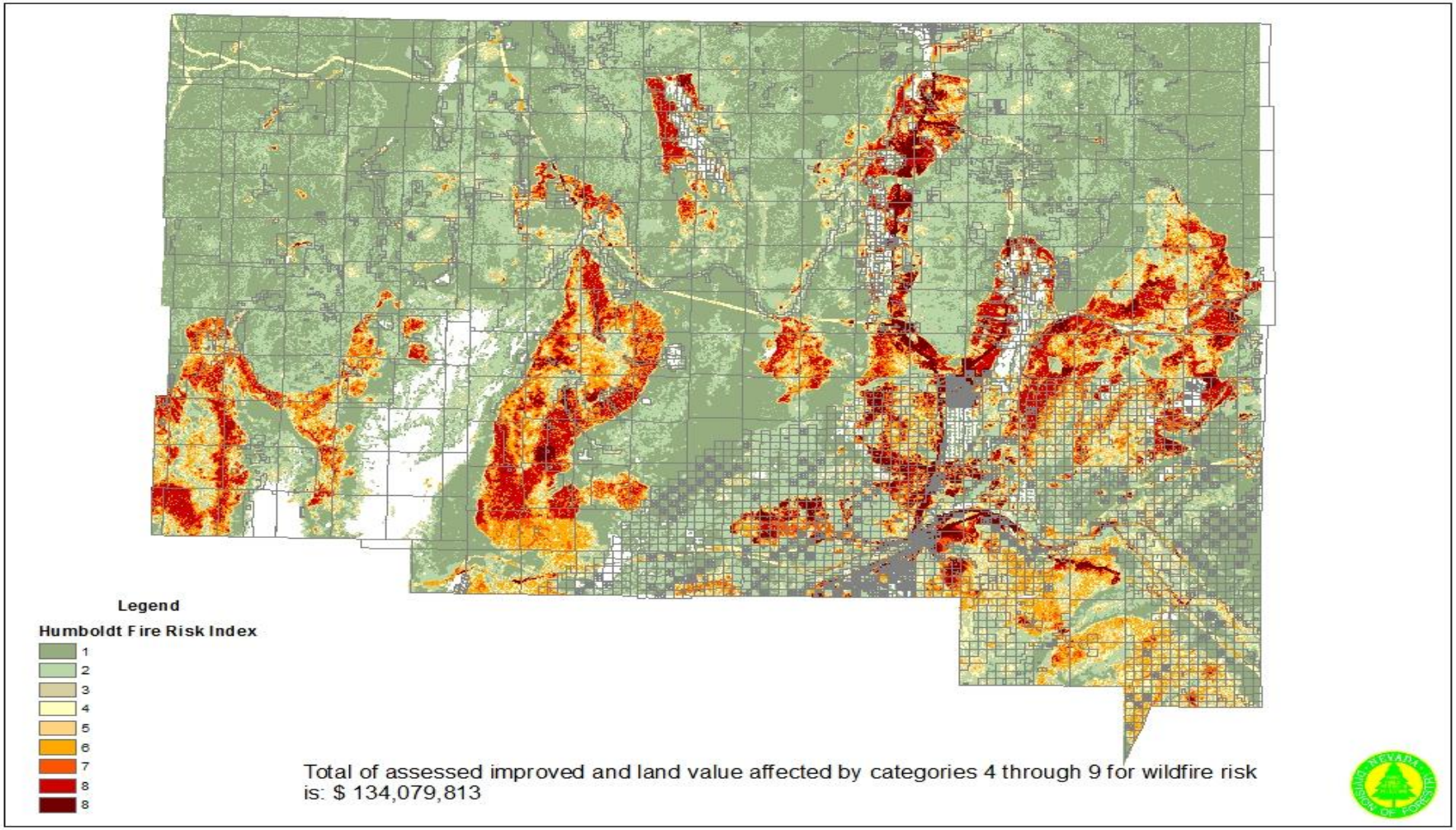
Elko Wildfire Hazard Mitigation Map



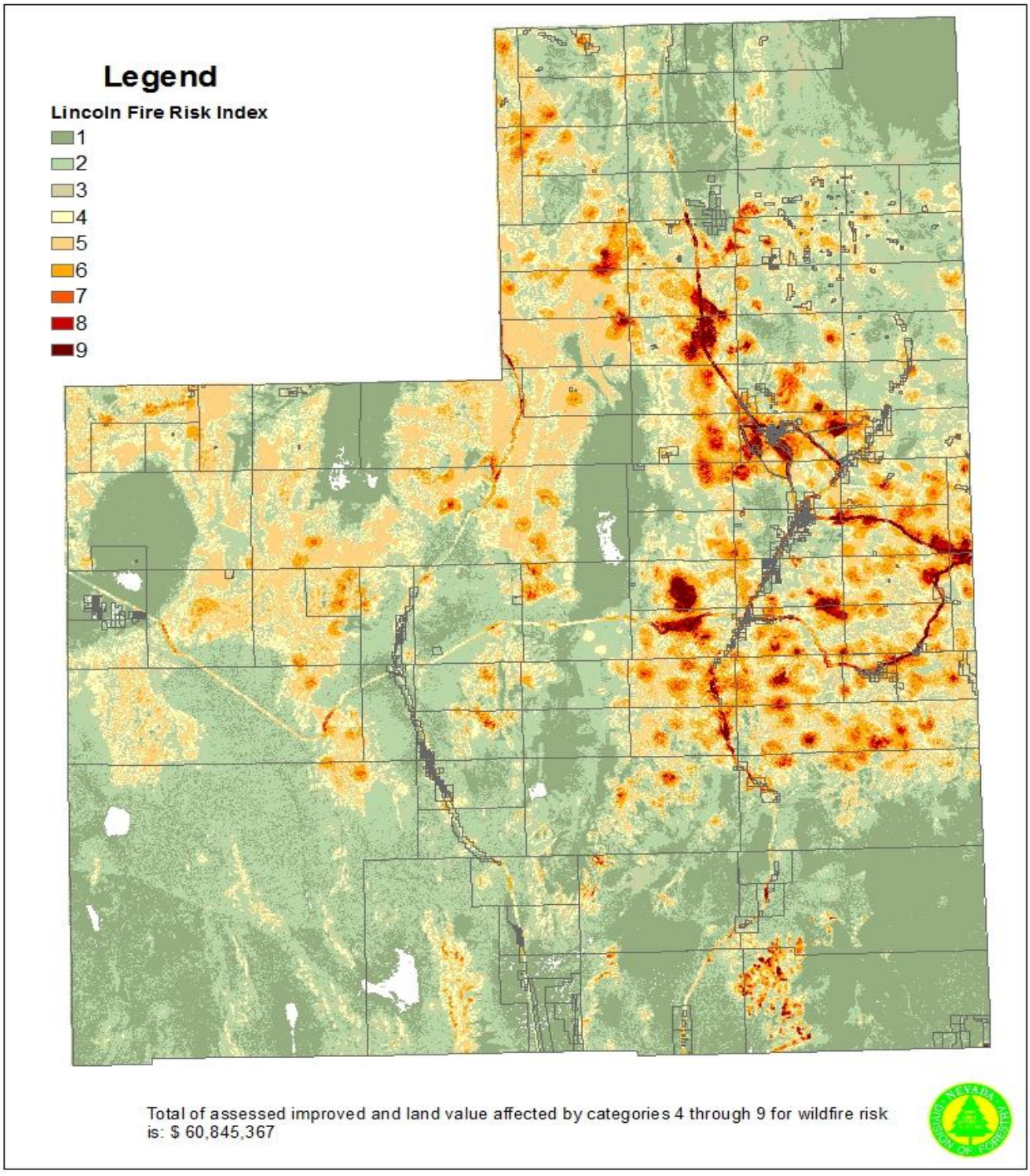
Eureka County Wildfire Hazard Mitigation



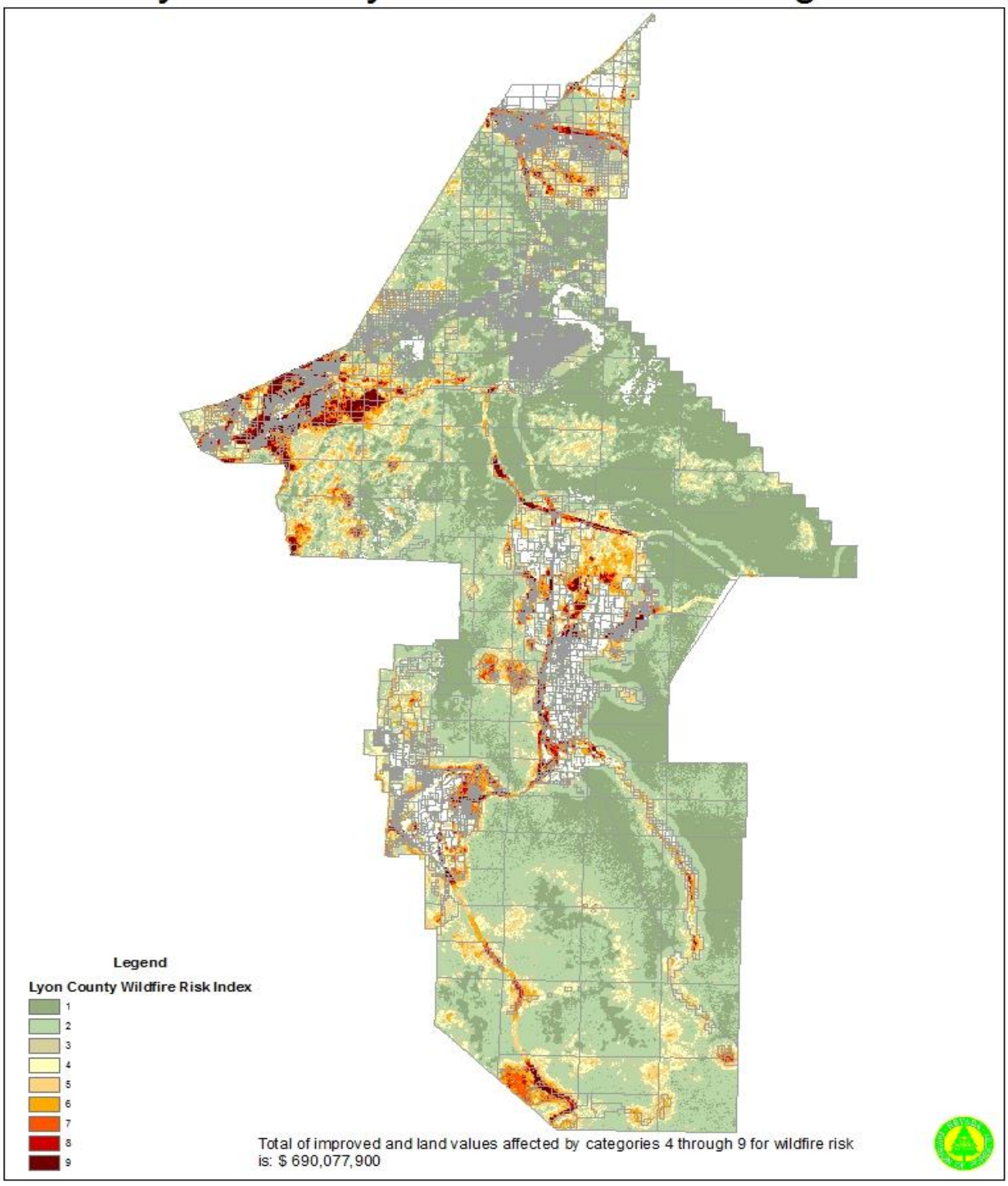
Humboldt County Wildfire Hazard Mitigation



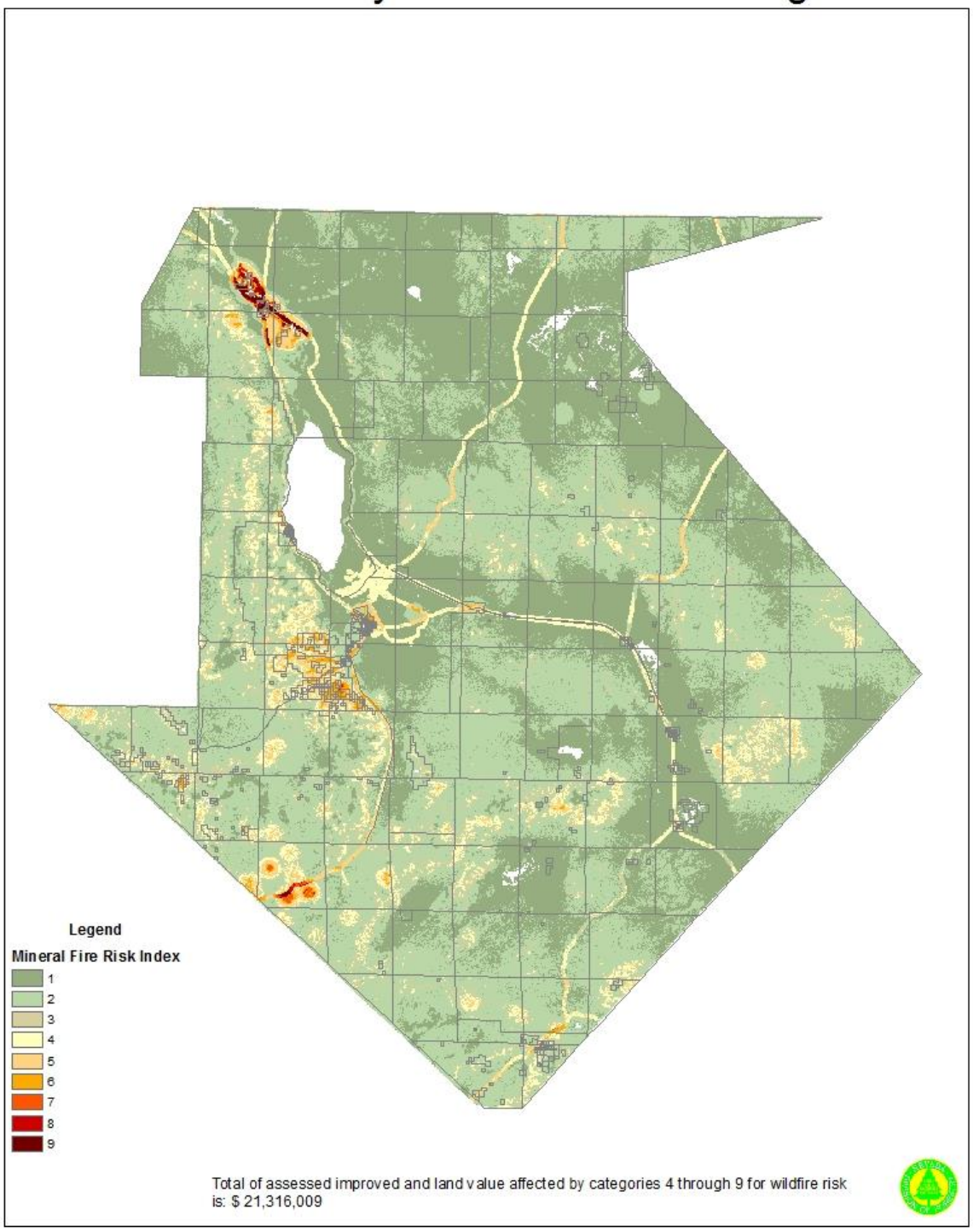
Lincoln County Wildfire Hazard Mitigation



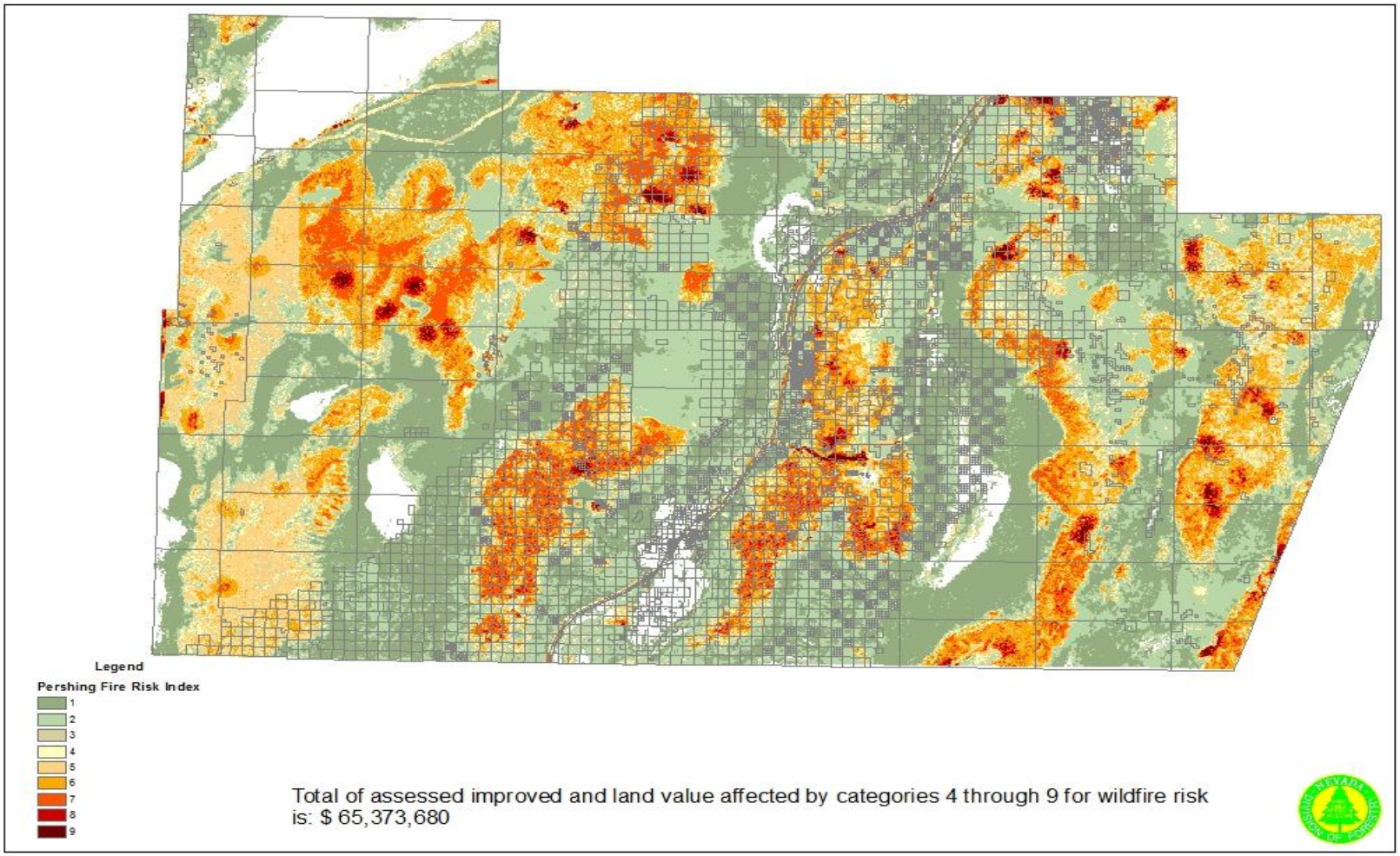
Lyon County Wildfire Hazard Mitigation



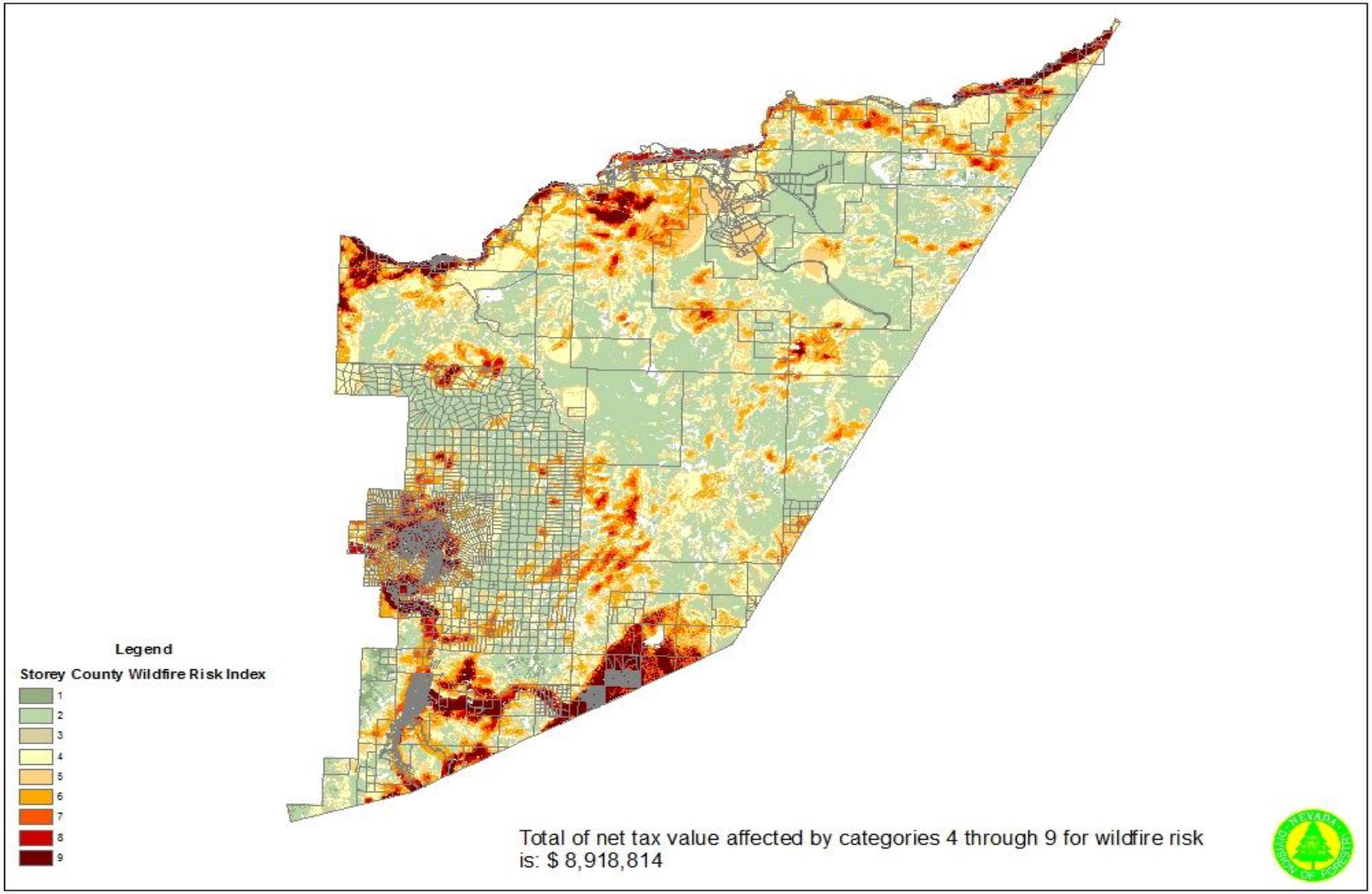
Mineral County Wildfire Hazard Mitigation



Pershing County Wildfire Hazard Mitigation

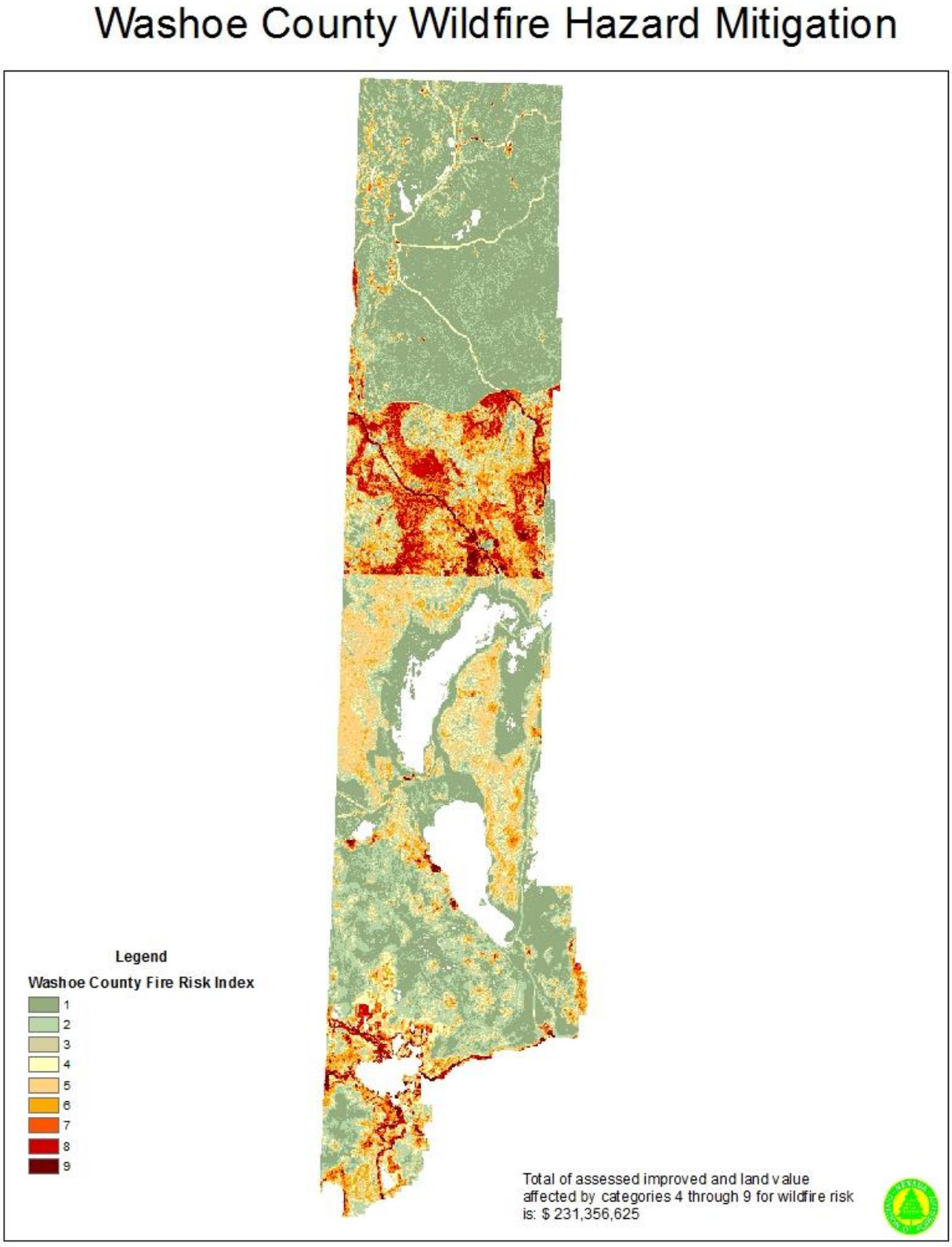


Storey County Wildfire Hazard Mitigation



APPENDIX J

Wildfire & State Owned Buildings



Summary of county assessors' property value lists used in NDF GIS wildfire data analysis			
County	**Land Value**	**Value of Improvements**	**Total Assessed Parcel Value**
Carson City	$223,854,882	$262,538,415	$486,393,297
Elko	$167,065,455	$397,958,761	$565,024,216
Lyon	$236,426,676	$453,651,224	$690,077,900
Douglas	$947,635,910	$709,881,468	$1,657,517,378
Churchill	$25,629,187	$31,231,967	$56,861,154
Mineral	$9,600,177	$11,715,832	$21,316,009
Humboldt	$42,691,904	$91,387,909	$134,079,813
Eureka	$6,431,705	$16,948,248	$23,379,953
Pershing	$52,653,783	$12,719,897	$65,373,680
Lincoln	$25,439,419	$35,405,948	$60,845,367
Clark	$674,876,181	$7,583,463,653	$8,258,339,834
Washoe	$4,441,145,914	$6,906,002,511	$11,347,148,425
Storey (Net Tax Value)			$8,918,814
TOTAL			$23,375,275,840

APPENDIX K Extreme Weather Data

Extreme weather has relevance to various other hazard types that include avalanche, flooding, and landslide. In 2007, the State Climatologist prepared summary data on extreme weather for each county from records of the National Climatic Data Center (NCDC). These data are made available below to local and county jurisdictions and tribal entities to assist in preparedness and response planning. These data include historical summaries of the following severe weather events:

- Damage-causing storm events
- Drought
- Extreme Temperatures (Heat)
- Precipitation Extremes (snow)
- Severe wind events
- Thunderstorm

An online map of the weather stations across the state from which these data were compiled is available at this link:

http://www.wrcc.dri.edu/summary/climsmnv.html

It includes a clickable function to view climate summaries for each station.

These files are available on the NDEM website at this link:

http://www.dem.state.nv.us/

Damage-causing storm events by County

The Nevada Climate Office under the direction of Dr. Jeff Underwood provided the following summary of information derived from the National Climate Data Center's website. The information, although not relevant to a state declaration, is valuable to Nevada's counties in their planning for response.

Damage-causing storm events reported by the National Climate Data (1959-2006).

Carson City

Total damage reported as $4,701,000 with 2 people being injured.

By Type

Hail: 1
Tornado: 1
Flood: 2
Heavy Rain: 4
Thunderstorm Wind: 3

Churchill County

Total damage reported as $11,000 with 1 person being injured.

By Type

Dust Devil: 1
Hail: 4
Thunderstorm Wind: 8
Funnel Cloud: 1
Tornado: 4
Lightning: 1-

Clark County

Total damage reported as $103,964,000 with 10 deaths, and 30 people injured.

By Type

Flash Flood: 67
Hail: 46
Heat: 1
High Wind: 6
Tornado: 11
Urban/Small Stream Flood: 8
Wildfire: 1
Dust Storm: 1
Funnel Cloud: 3
Heavy Rain: 3
Heavy Snow: 1
Lightning: 13
Thunderstorm Wind: 37
Whirlwind:
Winter Storm: 2

Douglas County

Total damage reported as $2,014,000 with 2 people being injured.

By Type

Flash Flood: 3
Heavy Rain: 4
Lightning: 4
Thunderstorm Wind: 3
Dust Devil: 1
Hail: 3
High Wind: 5
Tornado: 13

Elko County

Total damage reported as $663,000 with 30 people being injured.
By Type

Dry Microburst: 2
Flash Flood: 14
Funnel Cloud: 4
Heavy Snow: 49
Tornado: 13
Urban/Small Stream Flood: 2
Winter Storm: 4
Blizzards: 2
Dust Storm: 1
Flood: 5
Hail: 22
High Wind: 14
Thunderstorm Wind: 59
Wildfire: 1
Winter Weather/Mix: 1

Esmeralda County

Total damage reported as $40,000 with 0 injuries.
By Type

Tornado: 1
Flash Flood: 3

Eureka County

Total damage reported as $100,000 with 0 injuries.
By Type

Hail: 6
High Wind: 1
Thunderstorm Wind: 7
Flash Flood: 6
Heavy Snow: 1
Tornado: 3
Winter Storm: 1

Humboldt County

Total damage reported as $123,000 with 0 injuries.
By Type

Dust Storm: 1
Hail: 6
High Wind: 8
Thunderstorm Wind: 19
Winter Storm: 2
Flash Flood: 1
Heavy Snow: 9
Tornado: 5
Wildfire: 1
Winter Weather/Mix: 1

Lander County

Total damage reported as $9,000 with 1 person being injured.
By Type

Dust Storm: 1
Flood: 5
Heavy Snow: 39

Lincoln County

Total damage reported as $20,990,000 with 0 injuries.
By Type

Flood: 1
Heavy Snow: 12
Tornado: 6

Tornado: 1
Flash Flood: 2
Hail: 14
High Wind: 4
Thunderstorm Wind: 21
Winter Storm: 6
Winter Weather/Mix: 1

Lyon County

Total damage reported as $593,000 with 1 death, and 1 person injured.

By Type

Flash Flood: 4
Flood: 3
Funnel Cloud: 1
Hail: 5
High Wind: 1
Ice on Road: 1
Tornado: 4
Thunderstorm Wind: 16

Mineral County

Total damage reported as $649,819,000 with 8 deaths, and 63 people injured.

By Type

Blizzards: 1

Dense Fog: 2
Dust Storm: 2
Extreme Cold: 1
Flash Flood: 6
Flood: 2
Fog: 2
Hail: 4
Heat: 1
Heavy Rain: 2
Heavy Snow: 46
High Wind: 63
Thunderstorm Wind: 1
Urban/Small Stream Flood: 1
Winter Storm: 1

Nye County

Total damage reported as $3,563,000 with 1 death, and 2 people injured.

By Type

Flash Flood: 11
Hail: 2
Heavy Snow: 12
High Wind: 13
Lightning: 2
Tornado: 4
Thunderstorm Wind: 18
Urban/Small Stream Flood: 1

Pershing County

Total damage reported as $150,000 with 0 injuries.

By Type

Flash Flood: 1
Flood: 1
Hail: 1
Thunderstorm Wind: 14

Storey County

Total damage reported as $3,477,000 with 0 injuries.

By Type

Flash Flood: 5
Flood: 1
Hail: 2

White Pine County

Total damage reported as $145,000 with 1 person injured.

By Type

Dust Storm: 1
Flash Flood: 7
Flood: 1
Fog: 1
Funnel Cloud: 1
Hail: 5
Heavy Snow: 38
High Wind: 7
Tornado: 7
Thunderstorm Wind: 11
Winter Storm: 2
Winter Weather/Mix: 1

Washoe County

Total damage reported as $654,446,000 with 5 deaths, and 56 people injured.

By Type

Dense Fog: 4
Dust Devil: 1
Extreme Cold: 1
Flash Flood: 12
Flood: 7
Funnel Cloud: 4
Hail: 23
Heat: 1
Heavy Rain: 16
Heavy Snow: 4
High Wind: 20
Lightning: 2
Other: 2
Tornado: 11
Thunderstorm Wind: 42
Urban/Small Stream Flood: 4
Wildfire: 1
Winter Storm: 4
Winter Weather/Mix: 1

Drought

The State Climatologist prepared the following historical data on drought for each county from National Climatic Data Center (NCDC) records from 1895 to the present. The index used in these analyses was the Palmer Drought Severity Index (PDSI). The PDSI indicates the prolonged and abnormal moisture deficiency or excess. The index normally runs between –7 and 7. The scale for this index is defined in the following chart.

	Drought intensity	Wetness
Extreme	-4 or less	4 or greater
Severe	-3.9 – -3.0	3.9 – 3.0
Moderate	-2.9 – -2.0	2.9 – 2.0
Mild	-1.9 – -1.0	1.9 – 1.0
Incipient	-0.99 – -0.51	0.99- 0.51
Normal	0.0 – 0.5	0.0 – 0.5

Historical Drought Data by County

Carson City:

Carson City County lies within Nevada's Northwestern climate division 1. The data are reported from 1895 to the present by the National Climatic Data Center (NCDC). In the Northwestern division there were 110 observed months in the time span from 1895—2006 that were rated as Extreme Drought, -4 or less. The major drought years in this division were 1924, 1926, 1928, 1928, 1931, 1934, 1947, 1954, 1955, 1959, 1988, 1992, 1994, and 2001-2004. The worst drought years were 1992, 2002, and 2003, in which 11 out of 12 months were below –4, with July 1992 being the most severe, peaking out at –6.12.

Churchill County:

Churchill County lies within Nevada's Northwestern climate division 1. The drought data are reported from 1895 to the present by the National Climatic Data Center (NCDC). In the Northwestern division there were 110 observed months in the time span from 1895—2006 that were rated as Extreme Drought, -4 or less. The major drought years in this division were 1924, 1926, 1928, 1928, 1931, 1934, 1947, 1954, 1955, 1959, 1988, 1992, 1994, and 2001-2004. The worst years were 1992, 2002, and 2003, in which 11 out of 12 months were below –4 with July 1992 being the most severe, peaking out at –6.12.

Clark County:

Clark County lies within Nevada's Extreme Southern climate division. The drought data are reported from 1895 to the present by the National Climatic Data Center (NCDC). In the Extreme Southern division there were 23 observed months in the time span from 1895—2006 that were rated as Extreme Drought, -4 or less. The major drought years in this division were 1996, 1997, and 2002. The worst year was 2002, in which nine out of twelve months were below –4, with August peaking out at –5.19.

Douglas County:

Douglas County lies within Nevada's Northwestern climate division 1. The drought data are reported from 1895 to the present by the National Climatic Data Center (NCDC). In the Northwestern division there were 110 observed months in the time span from 1895—2006 that were rated as Extreme Drought; -4 or less. The major drought years in this division were 1924, 1926, 1928, 1928, 1931, 1934, 1947, 1954, 1955, 1959, 1988, 1992, 1994, and 2001-2004. The worst years were 1992, 2002, and 2003, in which 11 out of 12 months were below –4, with July 1992 being the most severe peaking out at –6.12.

Elko County:

Elko County lies within Nevada's Northeastern climate division 2. The drought data are reported from 1895 to the present by the National Climatic Data Center (NCDC). In the Northeastern division there were 93 observed months in the time span from 1895—2006 that were rated as Extreme Drought, -4 or less. The major drought years in this division were 1924, 1926, 1928, 1928, 1929, 1931, 1934, 1954, 1992, and 2001. The worst year was 1934, in which every month was far below –4 with August peaking out at –8.53.

Esmeralda County:

Esmeralda County lies within Nevada's South Central climate division 3. The drought data are reported from 1895 to the present by the National Climatic Data Center (NCDC). In the South Central division there were 31 observed months in the time span from 1895—2006 that were rated as Extreme Drought -4 or less. The major drought years in this division were 1928, 1934, 1959, 1960, and 2002. The worst years were 1928 and 1934, in which seven out of twelve months were below –4, with May 1934 peaking out at –6.3.

Eureka County:

Eureka County lies within Nevada's Northeastern climate division 2. The drought data are reported from 1895 to the present by the National Climatic Data Center (NCDC). In the Northeastern division there were 93 observed months in the time

span from 1895—2006 that were rated as Extreme Drought, -4 or less. The major drought years in this division were 1924, 1926, 1928, 1928, 1929, 1931, 1934, 1954, 1992, and 2001. The worst year was 1934, in which every month was far below –4, with August peaking out at –8.53.

Humboldt County:

Humboldt County lies within Nevada's Northwestern climate division 1. The drought data are reported from 1895 to the present by the National Climatic Data Center (NCDC). In the Northwestern division there were 110 observed months in the time span from 1895—2006 that were rated as Extreme Drought, -4 or less. The major drought years in this division were 1924, 1926, 1928, 1928, 1931, 1934, 1947, 1954, 1955, 1959, 1988, 1992, 1994, and 2001-2004. The worst years were 1992, 2002, and 2003. In these years, 11 out of 12 months were below –4 with July 1992 being the most severe, peaking out at –6.12.

Lander County:

Lander County lies within Nevada's Northeastern climate division; division 2. The drought data are reported from 1895 to the present by the National Climatic Data Center (NCDC). In the Northeastern division there were 93 observed months in the time span from 1895—2006 that were rated as Extreme Drought, -4 or less. The major drought years in this division were 1924, 1926, 1928, 1928, 1929, 1931, 1934, 1954, 1992, and 2001. The worst year was 1934, in which every month was far below –4, with August peaking out at –8.53.

Lincoln County:

Lincoln County lies mostly within Nevada's South Central climate division 3. The very southern portion of the county is in division four. The drought data are reported from 1895 to the present by the National Climatic Data Center (NCDC). In the South Central division there were 31 observed months in the time span from 1895—2006 that were rated as Extreme Drought, -4 or less. The major drought years in this division were 1928, 1934, 1959, 1960, and 2002. The worst years were 1928 and 1934, in which seven out of twelve months were below –4, with May 1934 peaking out at –6.3.

Lyon County:

Lyon County lies within Nevada's Northwestern climate division 1. The drought data are reported from 1895 to the present by the National Climatic Data Center (NCDC). In the Northwestern division there were 110 observed months in the time span from 1895—2006 that were rated as Extreme Drought; -4 or less. The major drought years in this division were 1924, 1926, 1928, 1928, 1931, 1934, 1947, 1954, 1955, 1959, 1988, 1992, 1994, and 2001-2004. The worst years were 1992, 2002, and 2003, in which 11 out of 12 months were below –4, with July 1992 being the most severe, peaking out at –6.12.

Mineral County:

Mineral County lies within Nevada's South Central climate division 3. The drought data are reported from 1895 to the present by the National Climatic Data Center (NCDC). In the South Central division there were 31 observed months in the time span from 1895—2006 that were rated as Extreme Drought, -4 or less. The major drought years in this division were 1928, 1934, 1959, 1960, and 2002. The worst years were 1928 and 1934, in which seven out of twelve months were below –4, with May 1934 peaking out at –6.3.

Nye County:

Nye County lies mostly within Nevada's South Central climate division 3. The very southern portion of the county is in division four. The drought data are reported from 1895 to the present by the National Climatic Data Center (NCDC). In the South Central division there were 31 observed months in the time span from 1895—2006 that were rated as Extreme Drought, -4 or less. The major drought years in this division were 1928, 1934, 1959, 1960, and 2002. The worst years were 1928 and 1934, in which seven out of twelve months were below –4, with May 1934 peaking out at –6.3.

Pershing County:

Pershing County lies within Nevada's Northwestern climate division 1. The drought data are reported from 1895 to the present by the National Climatic Data Center (NCDC). In the Northwestern division there were 110 observed months in the time span from 1895—2006 that were rated as Extreme Drought; -4 or less. The major drought years in this division were 1924, 1926, 1928, 1928, 1931, 1934, 1947, 1954, 1955, 1959, 1988, 1992, 1994, and 2001-2004. The worst years were 1992, 2002, and 2003, in which 11 out of 12 months were below –4, with July 1992 the most severe, peaking out at –6.12.

Storey County:

Storey County lies within Nevada's Northwestern climate division 1. The drought data are reported from 1895 to the present by the National Climatic Data Center (NCDC). In the Northwestern division there were 110 observed months in the time span from 1895—2006 that were rated as Extreme Drought; -4 or less. The major drought years in this division were 1924, 1926, 1928, 1928, 1931, 1934, 1947, 1954, 1955, 1959, 1988, 1992, 1994, and 2001-2004. The worst years were 1992, 2002, and 2003, in which 11 out of 12 months were below –4, with July 1992 the most severe, peaking out at –6.12.

Washoe County:

Washoe County lies within Nevada's Northwestern climate division 1. The drought data are reported from 1895 to the present by the National Climatic Data Center (NCDC). In the Northwestern division there were 110 observed months in the time span from 1895—2006 that were rated as Extreme Drought; -4 or less. The major drought years in this division were 1924, 1926, 1928, 1928, 1931, 1934, 1947, 1954, 1955, 1959, 1988, 1992, 1994, and 2001-2004. The worst years were 1992, 2002, and 2003, in which 11 out of 12 months were below –4, with July 1992 the most severe, peaking out at –6.12.

White Pine County:

White Pine County lies within Nevada's Northeastern climate division 2. The drought data are reported from 1895 to the present by the National Climatic Data Center (NCDC). In the Northeastern division there were 93 observed months in the time span from 1895—2006 that were rated as Extreme Drought; -4 or less. The major drought years in this division were 1924, 1926, 1928, 1928, 1929, 1931,1934, 1954, 1992, and 2001. The worst year was 1934, in which every month was considerably below –4, with August peaking out at –8.53.

Extreme Temperatures (Heat) by County

The State Climatologist data on extreme temperatures compiled in 2007 for representative sites within each county are presented below:

Carson City:

Daytime maximum temperatures were analyzed to determine the threat heat can pose. The number of days that reached or exceeded 100° were also calculated. Within Carson City County one station was available; Carson City. At Carson City 127 days were observed to have a temperature of 100° or higher within the time span from 1893 to 2006. This equates to a frequency of just more than 1 day per year (1.34), leading to the conclusion that Carson City County historically is not at threat to suffering from heat above 100° F. A summary of the station follows:

- Carson City - Days of 100° or higher = 127, frequency = 1.34 days/year

Churchill County:
Daytime maximum temperatures were analyzed to determine the threat heat can pose. The number of days that reached or exceeded 100° were also calculated. Within Churchill County two representative stations were selected; Fallon NAS and Hawthorne AP. On average Churchill County can expect about **10** days a year at or above 100°. A summary of the two stations follows:

- Fallon NAS - Days of 100° or higher = 540, frequency = 10.65 days/year
- Hawthorne AP - Days of 100° or higher = 571, frequency = 8.98 days/year

Clark County:
Daytime maximum temperatures were analyzed to determine the threat heat can pose. The number of days that reached or exceeded 100° were also calculated. Within Clark County five representative stations were selected; Mesquite, Searchlight, Las Vegas AP, Indian Springs, and Valley of Fire SP. Searchlight had an abnormally lower frequency of events than the rest of the stations in Clark County. The other stations had much higher numbers, averaging **80.69** days a year at 100° or higher, leading to the conclusion that Clark County historically is at threat to suffering from heat above 100° F. A summary of the five stations follows:

- Searchlight - Days of 100° or higher = 2193, frequency = 24.87 days/year
- Las Vegas AP - Days of 100° or higher = 4279, frequency = 74.48 days/year
- Indian Springs - Days of 100° or higher = 1899, frequency = 68.15 days/year
- Valley of Fire SP - Days of 100° or higher = 2787, frequency = 83.31 days/year
- Mesquite - Days of 100° or higher = 1784, frequency = 96.80 days/year

Douglas County:
Daytime maximum temperatures were analyzed to determine the threat heat can pose. The number of days that reached or exceeded 100° were also calculated.

Within Douglas County three representative stations were selected; Minden, Glenbrook, and Topaz Lake. A summary of the three stations follows:

- Minden - Days of 100° or higher = 267, frequency = 2.79 days/year
- Glenbrook - Days of 100° or higher = 0, frequency = 0.00 days/year
- Topaz Lake - Days of 100° or higher = 55, frequency = 1.92 days/year

Elko County:
Daytime maximum temperatures were analyzed to determine the threat heat can pose. The number of days that reached or exceeded 100° were also calculated. Within Elko County five representative stations were selected; Elko AP, Jiggs, San Jacinto, Clover Valley, and Tuscarora. Only at the Elko AP station did 100° weather appear more than once a year. The other stations had much lower numbers, leading to the conclusion that Elko County historically is not at threat to suffering from heat above 100° F. A summary of the five stations follows:

- Elko AP - Days of 100° or higher = 326, frequency = 3.01 days/year
- Jiggs - Days of 100° or higher = 7, frequency = 0.46 days/year
- Tuscarora - Days of 100° or higher = 0, frequency = 0.00 days/year
- Clover Valley - Days of 100° or higher = 0, frequency = 0.00 days/year
- San Jacinto - Days of 100° or higher = 24, frequency = 0.60 days/year

Esmeralda County:
Daytime maximum temperatures were analyzed to determine the threat heat can pose. The number of days that reached or exceeded 100° were also calculated. Within Esmeralda County three representative stations were selected; Silverpeak, Coaldale Junction and Goldfield. The longest period of record was from the Goldfield station. At Goldfield the frequency was much lower than the other stations, averaging less than 1 day per year. The other stations had higher numbers, perhaps Goldfield being over 1000 feet higher in elevation than the other two may be the reasoning for this. A summary of the three stations follows:

- Coaldale Junction - Days of 100° or higher = 401, frequency = 32.10 days/year
- Goldfield- Days of 100° or higher = 68, frequency = 0.73 days/year
- Silverpeak - Days of 100° or higher = 912, frequency = 23.45 days/year

Eureka County:
Daytime maximum temperatures were analyzed to determine the threat heat can pose. The number of days that reached or exceeded 100° were also calculated. Within Eureka County two representative stations were selected; Eureka and Beowawe. The longest period of record was from the Eureka station. At Eureka 30 days were observed to have a temperature of 100° or higher within the time span from 1888 to 2006. This equates to a frequency of less than one day per year. The other station had higher numbers, but nothing out of the ordinary. A summary of the two stations follows:

- Eureka- Days of 100° or higher = 30, frequency = 0.35 days/year
- Beowawe - Days of 100° or higher = 468, frequency = 5.06 days/year

Humboldt County:
Daytime maximum temperatures were analyzed to determine the threat heat can pose. The number of days that reached or exceeded 100° were also calculated, averaging **4.80** days/year. Within Humboldt County two representative stations were selected; Winnemucca AP and Quinn River Crossing. A summary of the two stations follows:

- Winnemucca AP - Days of 100° or higher = 521, frequency = 5.86 days/year
- Quinn River Crossing - Days of 100° or higher = 99, frequency = 3.73 days/year

Lander County:
Daytime maximum temperatures were analyzed to determine the threat heat can pose. The number of days that reached or exceeded 100° were also calculated. Within Lander County two representative stations were selected; Austin and Battle Mountain. There was a wide range of observations at the two stations. Austin only had a 100° plus day once every five years where as Battle Mountain averages nearly 10 days a year. Austin is located over 2000ft higher in elevation than Battle Mountain so that could be the reason. A summary of the two stations follows:

- Battle Mountain - Days of 100° or higher = 578, frequency = 9.55 days/year
- Austin - Days of 100° or higher = 20, frequency = 0.18 days/year

Lincoln County:
Daytime maximum temperatures were analyzed to determine the threat heat can pose. The number of days that reached or exceeded 100° were also calculated. Within Lincoln County four representative stations were selected; Elgin, Caliente, Pioche, and Pahranaghat Wildlife Refuge. The Pioche station had abnormally low numbers when compared to the other stations, but it is also at a much higher elevation than the others. With the Pioche frequency removed Lincoln County could expect about **24** days per year at or above 100°. A summary of the four stations follows:

- Elgin - Days of 100° or higher = 638, frequency = 29.81 days/year
- Caliente - Days of 100° or higher = 389, frequency = 13.84 days/year
- Pioche - Days of 100° or higher = 116, frequency = 1.49 days/year
- Pahranaghat - Days of 100° or higher = 1173, frequency = 28.36 days/year

Lyon County:
Daytime maximum temperatures were analyzed to determine the threat heat can pose. The number of days that reached or exceeded 100° were also calculated. Within Lyon County three representative stations were selected; Yerington, Wellington Ranger Station, and Fernley. A summary of the three stations follows:

- Wellington Ranger Station - Days of 100° or higher = 10, frequency = 0.33 days/year
- Yerington - Days of 100° or higher = 329, frequency = 3.62 days/year
- Fernley - Days of 100° or higher = 311, frequency = 10.28 days/year

Mineral County:
Daytime maximum temperatures were analyzed to determine the threat heat can pose. The number of days that reached or exceeded 100° were also calculated. Within Mineral County two representative stations were selected; Mina and Thorne. The longest period of record was from the Mina station. At Mina 1317 days were observed to have a temperature of 100° or higher within the time span from 1896 to 2006. This equates to a frequency of more than 12 days a year (12.65). The other station had lower numbers. County average: **10.67** days per year. A summary of the two stations follows:

- Mina - Days of 100° or higher = 1317, frequency = 12.65 days/year
- Thorne - Days of 100° or higher = 293, frequency = 8.69 days/year

Nye County:
Daytime maximum temperatures were analyzed to determine the threat heat can pose. The number of days that reached or exceeded 100° were also calculated. Within Nye County five representative stations were selected; Tonopah, Pahrump, Sarcobatus, Duckwater, and Smokey Valley. The longest period of record was from the Pahrump station. At Pahrump 2,972 days were observed to have a temperature of 100° or higher within the time span from 1914 to 2006. This equates to a frequency of nearly 51 days per year (50.71). The other stations had lower numbers, but Nye County is a very large county that spans numerous climate types. A summary of the five stations follows:

- Tonopah - Days of 100° or higher = 108, frequency = 2.03 days/year
- Pahrump - Days of 100° or higher = 2972, frequency = 50.71 days per year
- Sarcobatus - Days of 100° or higher = 515, frequency = 28.10 days/year
- Duckwater - Days of 100° or higher = 35, frequency = 1.12 days/year
- Smoky Valley - Days of 100° or higher = 46, frequency = 0.84 days/year

Pershing County:
Daytime maximum temperatures were analyzed to determine the threat heat can pose. The number of days that reached or exceeded 100° were also calculated. Within Pershing county four representative stations were selected; Lovelock Derby Field, Imlay, Paris Ranch and Gerlach. The longest period of record was from the Imlay station. At Imlay 647 days were observed to have a temperature of 100° or higher within the time span from 1914 to 2006. This equates to a frequency of nearly 8 days a year (7.64). Two of the three stations had higher numbers, averaging out at 11.26 days per year, leading to the conclusion that Pershing County historically is prone to receiving heat above 100° F. A summary of the four stations follows:

- Imlay - Days of 100° or higher = 647, frequency = 7.64 days/year
- Lovelock Derby Field - Days of 100° or higher = 614, frequency = 11.11 days/year
- Paris Ranch - Days of 100° or higher = 503, frequency = 20.26 days/year
- Gerlach - Days of 100° or higher = 201, frequency = 6.02 days/year

Storey County:
Daytime maximum temperatures were analyzed to determine the threat heat can pose. The number of days that reached or exceeded 100° were also calculated. Within Storey County, one station was available; Virginia City. At Virginia City only 1 day was observed to have a temperature of 100° or higher within the time span from 1951 to 2006. The conclusion is that Storey County historically is not at threat to suffering from heat above 100° F. A summary of the station follows:

- Virginia City - Days of 100° or higher = 1, frequency = 0.02 days/year

Washoe County:
Daytime maximum temperatures were analyzed to determine the threat heat can pose. The number of days that reached or exceeded 100° were also calculated. Within Elko County four representative stations were selected; Reno AP, Vya, Nixon and Sand Pass. The average in Washoe County is **6.44** days per year. A summary of the three stations follows:

- Reno AP - Days of 100° or higher = 1061, frequency = 15.42 days/year
- Vya - Days of 100° or higher = 1, frequency = 0.06 days/year
- Sand Pass - Days of 100° or higher = 288, frequency = 5.57 days/year
- Nixon - Days of 100° or higher = 172, frequency = 4.72 days/year

White Pine County:
Daytime maximum temperatures were analyzed to determine the threat heat can pose. The number of days that reached or exceeded 100° were also calculated. Within White Pine County three representative stations were selected; Ely Yelland Field, Lund, and McGill. The average in White Pine County was one day in five years (**0.20**) would be at or above 100°. A summary of the three stations follows:

- Ely, Yelland Field - Days of 100° or higher = 3, frequency = 0.04 days/year
- Lund - Days of 100° or higher = 17, frequency = 0.35 days/year
- McGill - Days of 100° or higher = 19, frequency = 0.20 days/year

Precipitation Extremes (snow) by County

The State Climatologist prepared the following data about extreme snow fall in each county. The data is not relevant to state declarations but will assist each county in its preparedness and response planning.

Carson City:

Snow occurs more frequently in Carson City County than high temperatures. The same station was used in this county; Carson City. To qualify as an 'extreme' event the snowfall had to be above the 15th percentile of overall snowfall at that particular station. The average value at the 15th percentile was 1.26 inches in one day. The summary of the snowfall events above the 15th percentile follow:

- Carson City: Days above 15th percentile = 232; Frequency = 2.61 days/year

Churchill County:

Snow occurs in smaller amounts in Churchill County than some other northern counties in Nevada. Four stations were used as representatives within the county; Lahontan Dam, Hawthorne, and Fallon NAS. All the stations had low levels of snow. To qualify as an 'extreme' event the snowfall had to be above the 15th percentile of overall snowfall at that particular station. The average value at the 15th percentile was any amount over **0.26** inches in one day. The summary of the snowfall events above the 15th percentile follow:

- Lahontan Dam - Days > 15th = 209; Freq = 2.96 days/year
- Hawthorne - Days > 15th = 99; Freq = 1.90 days/year
- Fallon NAS - Days > 15th = 128; Freq = 2.47 days/year

Clark County:

Snow occurs much less frequently in Clark County than high temperatures. The same five stations were used as representatives within the county; Mesquite, Searchlight, Las Vegas AP, Indian Springs, and Valley of Fire SP. Not surprisingly at all the stations any snowfall above 0.00 qualified as extreme. To qualify as an 'extreme' event the snowfall had to be above the 15th percentile of overall snowfall at that particular station. The average value at the 15th percentile was any over **0.00** inches in one day. The summary of the snowfall events above the 15th percentile follow:

- Searchlight - Days > 15th = 70; Freq = 0.96 days/year
- Las Vegas AP - Days > 15th = 26; Freq = 0.54 days/year
- Indian Springs - Days > 15th = 22; Freq = 0.86 days/year
- Valley of Fire SP - Days > 15th = 7; Freq = 0.21 days/year
- Mesquite - Days > 15th = 0; Freq = 0.00 days/year

Douglas County:

Four stations within Douglas county were used to access snowfall; Glenbrook, Minden, Spooners Station, and Topaz Lake. To qualify as an 'extreme' event the

snowfall had to be above the 15th percentile of overall snowfall at that particular station. The 15th percentile varied from 0.59 inches at Topaz Lake 3N to 3.35 inches at Spooners Station. The average value at the 15th percentile was 2.17 inches in one day. The summary of the snowfall events above the 15th percentile follow:

- Glenbrook - Days > 15th = 169; Freq = 2.69 days/year
- Minden - Days > 15th = 251; Freq = 2.81
- Spooners Station - Days > 15th = 30; Freq = 3.64
- Topaz Lake 3N - Days > 15th = 79; Freq = 2.92 days/year

ElkoCounty:

Snow occurs more frequently in Elko County than high temperatures. The same five stations were used as representatives within the county; Elko AP, Jiggs, San Jacinto, Clover Valley, and Tuscarora. Elko AP had the longest record but most of the stations had a similar frequency of snow events. To qualify as an 'extreme' event the snowfall had to be above the 15th percentile of overall snowfall at that particular station. The average value at the 15th percentile was **1.67** inches in one day. The summary of the snowfall events above the 15th percentile follow:

- Elko AP - Days > 15th = 245; Freq = 2.59 days/year
- Jiggs - Days > 15th = 65; Freq = 1.24 days/year
- Tuscarora - Days > 15th = 128; Freq = 3.12 days/year
- Clover Valley - Days > 15th = 127; Freq = 2.41 days/year
- San Jacinto - Days > 15th = 49; Freq = 1.69 days/year

Esmeralda County:

Snowfall was accessed in Esmeralda County. Four stations were used as representatives within the county; Coaldale Junction, Dyer, Silverpeak and Goldfield. The 15th percentile varied from 1.10 inches at Goldfield to anything above 0.00 inches at Silverpeak. To qualify as an 'extreme' event the snowfall had to be above the 15th percentile of overall snowfall at that particular station. The average value at the 15th percentile was 0.57 inches in one day. The summary of the snowfall events above the 15th percentile follow:

- Coaldale Junction - Days > 15th = 42; Freq = 2.76 days/year
- Dyer - Days > 15th = 182; Freq = 2.72 days/year
- Goldfield - Days > 15th = 195; Freq = 2.64 days/year
- Silverpeak- Days > 15th = 60; Freq = 1.65 days/year

Eureka County:

Three stations were used as representatives within the county; Eureka, Beowawe, and Emigrant Pass. Eureka had the longest and highest records but most of the other stations had similar frequencies of snow events. To qualify as an 'extreme' event the snowfall had to be above the 15th percentile of overall snowfall at that particular station. The average value at the 15th percentile was 1.63 inches in one day. The summary of the snowfall events above the 15th percentile follow:

- Eureka - Days > 15th = 133; Freq = 1.77 days/year

- Beowawe - Days > 15th = 42; Freq = 2.76 days/year
- Emigrant Pass - Days > 15th = 98; Freq = 2.27 days/year

Humboldt County:

Two stations were used in Humboldt County to access snowfall extremes; Quinn River Crossing and Winnemucca AP. To qualify as an extreme value the snowfall had to fall into the 15th percentile or above. The average value in Humboldt County at the 15th percentile was **0.89** inches. The values are reported as daily totals so the frequency is reported as days per year that can be expected to reach or exceed the 15th percentile. A summary of the stations follows:

- Quinn River Crossing: Days above 15th percentile = 63; Frequency = 3.56 days/year
- Winnemucca AP : Days above 15th percentile = 149; Frequency = 2.45 days/year

Lander County:

Four stations were used as representatives within the county; Central NV Field Lab, Battle Mountain, Austin, and Antelope Valley. To qualify as an 'extreme' event the snowfall had to be above the 15th percentile of overall snowfall at that particular station. The average value at the 15th percentile was **1.43** inches in one day. The summary of the snowfall events above the 15th percentile follow:

- Central NV Field Lab - Days > 15th = 38; Freq = 2.03 days/year
- Battle Mountain - Days > 15th = 77; Freq = 1.94 days/year
- Antelope Valley - Days > 15th = 41; Freq = 3.13 day/year
- Austin - Days > 15th = 174; Freq = 2.00 days/year

Lincoln County:

Snow occurs less frequently in Lincoln County than high temperatures. The same four stations were used as representatives within the county; Elgin, Caliente, Pioche, and Pahranaghat Wildlife Refuge. Pioche had the longest record of the stations, but also had higher readings than the rest. Two of the stations snow fall extreme fell into any measurement above 0.00 (Elgin and Pahranaghat). To qualify as an 'extreme' event the snowfall had to be above the 15th percentile of overall snowfall at that particular station. The average value at the 15th percentile was 0.49 inches in one day. The summary of the snowfall events above the 15th percentile follow:

- Pioche - Days > 15th = 160; Freq = 2.40 days/year
- Caliente - Days > 15th = 70; Freq = 2.65 days/year
- Elgin - Days > 15th = 5; Freq = 0.23 days/year
- Pahranaghat - Days > 15th = 30; Freq = 0.73 days/year

Lyon County:

The four stations used as representatives within the county; Wellington Ranger Station, Yerington, Smith, and Fernley. Yerington had the longest record but most of

the stations had a similar frequency of snow events. To qualify as an 'extreme' event the snowfall had to be above the 15th percentile of overall snowfall at that particular station. The average value at the 15th percentile was 0.57 inches in one day. The summary of the snowfall events above the 15th percentile follow:

- Wellington Ranger Station- Days > 15th = 90; Freq = 3.26 days/year
- Yerington - Days > 15th = 202; Freq = 2.35 days/year
- Smith - Days > 15th = 98; Freq = 2.20 days/year
- Fernley - Days > 15th = 71; Freq = 2.49 days/year

Mineral County:

The same two stations were used as representatives for snow within the county; Mina and Thorne. Mina had the longest record but the other station had a low frequency of extreme snow events as well. To qualify as an 'extreme' event the snowfall had to be above the 15th percentile of overall snowfall at that particular station. The average value at the 15th percentile was 0.34 inches in one day. The summary of the snowfall events above the 15th percentile follow:

- Mina - Days > 15th = 237; Freq = 2.41 days/year
- Thorne - Days > 15th = 41; Freq = 2.29 days/year

Nye County:

The same five stations were used as representatives within Nye County to access snow extremes; Tonopah, Pahrump, Sarcobatus, Duckwater, and Smokey Valley. At three of the stations any snow over 0.00 fell in the extreme snow event category; Pahrump, Sarcobatus, and Smokey Valley. To qualify as an 'extreme' event the snowfall had to be above the 15th percentile of overall snowfall at that particular station. The average value at the 15th percentile was **0.37** inches in one day. The summary of the snowfall events above the 15th percentile follow:

- Tonopah - Days > 15th = 121; Freq = 2.31 days/year
- Pahrump - Days > 15th = 22; Freq = 0.42 days/year
- Sarcobatus - Days > 15th = 31; Freq = 1.72 days/year
- Smokey Valley - Days > 15th = 107; Freq = 2.09 days/year
- Duckwater - Days > 15th = 86; Freq = 2.80 days/year

Pershing County:

Four stations were used as representatives within Pershing County to access snowfall extremes. Snowfall levels that measured as extreme varied from a low value of 0.20 inches at Lovelock to a high of 1.18 inches at Buffalo Ranch. The average value at the 15th percentile was **0.54** inches in one day. To qualify as an 'extreme' event the snowfall had to be above the 15th percentile of overall snowfall at that particular station. The summary of the snowfall events above the 15th percentile follow:

- Rye Patch Dam - Days > 15th = 171; Freq = 2.71 days/year
- Buffalo Ranch - Days > 15th = 36, Freq = 2.96 days/year
- Gerlach - Days > 15th = 74, Freq = 2.37 days/year

- Lovelock Derby Field - Days > 15th = 150, Freq = 3.12 days/year

Storey County:

Snow occurs more frequently in Storey County than high temperatures. The same station was used; Virginia City. To qualify as an 'extreme' event the snowfall had to be above the 15th percentile of overall snowfall at that particular station. The average value at the 15th percentile was over **2.09** inches in one day. The summary of the snowfall events above the 15th percentile follow:

- Virginia City - Days > 15th = 146; Freq = 2.81 days/year

Washoe County:

To qualify as an 'extreme' event the snowfall had to be above the 15th percentile of overall snowfall at that particular station. Washoe County is a thin, long county stretching from Lake Tahoe to Oregon. The range of extreme snowfall events was wide, from a high of **5.91** inches at **Marlette Lake** to a low of **0.20** inches in **Empire**. The average value at the 15th percentile was **1.98** inches in one day The summary of the snowfall events above the 15th percentile follow:

- Stead - Days > 15th = 60; Freq = 2.85 days/year
- Reno AP- Days > 15th = 189; Freq = 2.82 days/year
- Marlette Lake - Days > 15th = 55; Freq = 2.35 days/year
- Empire - Days > 15th = 36; Freq = 4.24 days/year

White Pine County:

Snow occurs more frequently in White Pine County than high temperatures. The six stations used as representatives within the county were; Ruth, Shoshone 5N, McGill, Lund, Great Basin NP, and Ely Yelland. To qualify as an 'extreme' event the snowfall had to be above the 15th percentile of overall snowfall at that particular station. The average value at the 15th percentile was **1.58** inches in one day. The summary of the snowfall events above the 15th percentile follow:

- Ruth - Days > 15th = 90; Freq = 2.38 days/year
- Shoshone 5N - Days > 15th = 55; Freq = 3.01 days/year
- McGill - Days > 15th = 208; Freq = 2.36 days/year
- Lund - Days > 15th = 120; Freq = 2.56 days/year
- Great Basin NP - Days > 15th = 45; Freq = 2.45 days/year
- Ely Yelland - Days > 15th = 154; Freq = 2.13 days/year

The State Climatologist prepared the following report on extreme snowfall averages in each county based on historical records. The data is will assist each county in its preparedness and response planning for extreme snowfall events. The table below summarizes the data showing the average number of days per year with extreme

snowfall for representative sites in each county. Extreme snowfall is defined as that above the 15th percentile for that county.

Average number of days per year with extreme snowfall for sites in each county

County	Site	15th percentile = extreme snowfall in inches/day	Average number of days per year over 15th percentile
Carson City	Carson City	1.26	2.61
Churchill	Lahontan Dam	0.26	2.96
Churchill	Fallon NAS	0.26	2.47
Churchill	Hawthorne	0.26	1.90
Clark	Searchlight	0.00	0.96
Clark	Las Vegas Airport	0.00	0.54
Clark	Indian Springs	0.00	0.86
Clark	Valley of Fire	0.00	0.21
Clark	Mesquite	0.00	0.00
Douglas	Minden	2.17	2.81
Douglas	Glenbrook	2.17	2.69
Douglas	Spooner's Station	2.17	3.64
Douglas	Topaz Lake	2.17	2.92
Elko	Elko Airport	1.67	2.59
Elko	Jiggs	1.67	1.24
Elko	Tuscarora	1.67	3.12
Elko	Clover Valley	1.67	2.41
Elko	San Jacinto	1.67	1.69
Esmeralda	Coaldale Junction	0.57	2.76
Esmeralda	Dyer	0.57	2.72
Esmeralda	Goldfield	0.57	2.64
Esmeralda	Silver Peak	0.57	1.65
Eureka	Eureka	1.63	1.77
Eureka	Beowawe	1.63	2.76
Eureka	Emigrant Pass	1.63	2.27
Humboldt	Winnemucca Airport	0.89	3.56
Humboldt	Quinn River Crossing	0.89	2.45
Lander	Central Nevada Field Lab	1.43	2.03
Lander	Battle Mountain	1.43	1.94
Lander	Antelope Valley	1.43	3.13
Lander	Austin	1.43	2.00
Lincoln	Pioche	0.49	2.40
Lincoln	Caliente	0.49	2.65
Lincoln	Elgin	0.49	0.23
Lincoln	Pahranagat	0.49	0.73
Lyon	Wellington	0.57	3.26

Lyon	Yerington	0.57	2.35
Lyon	Smith	0.57	2.20
Lyon	Fernley	0.57	2.49
Mineral	Mina	0.34	2.41
Mineral	Thorne	0.34	2.29
Nye	Tonopah	0.37	2.31
Nye	Pahrump	0.37	0.42
Nye	Sarcobatus	0.37	1.72
Nye	Smoky Valley	0.37	2.09
Nye	Duckwater	0.37	2.80
Pershing	Rye Patch Dam	0.54	2.71
Pershing	Buffalo Ranch	0.54	2.96
Pershing	Lovelock Derby Field	0.54	3.12
Storey	Virginia City	2.09	2.81
Washoe	Reno Airport	1.98	2.82
Washoe	Stead	1.98	2.85
Washoe	Gerlach	1.98	2.37
Washoe	Marlette Lake	1.98	2.35
Washoe	Empire	1.98	4.34
White Pine	Ruth	1.58	2.38
White Pine	Shoshone	1.58	3.01
White Pine	McGill	1.58	2.36
White Pine	Lund	1.58	2.56
White Pine	Great Basin NP	1.58	2.45
White Pine	Ely Yelland Field	1.58	2.13

Thunderstorm Events (hourly observations) by County

Carson City:

No stations in Carson City County reported thunderstorm activity. It should be noted that while no formal reporting of thunderstorms occurred in Carson City, all surrounding counties did record such hazard activity. It can be surmised from those records that thunderstorms have occurred but were not recorded in Carson City County.

Churchill County:
Within Churchill County there are two weather stations available that reported thunderstorm events during the time frame of 1945 - 2006. The reporting stations were Fallon NAS and Hawthorne; with Fallon NAS being the only one to have a complete record for the entire time span. These events were recorded hourly, so some days could have several readings for thunderstorm activity. A summary of the four stations events by type break down as follows:

- Dry Thunderstorms - 599
- Thunderstorms - 9
- Thunderstorms w/o Hail - 566
- Heavy Thunderstorms w/o Hail - 1
- Total Hourly recordings – 1175

The majority of these observations were made at the Fallon NAS station. These numbers equate to over **19 thunderstorms per year**, with roughly **51% being reported as dry thunderstorms**; which are a great concern for fire ignition.

Clark County:
Within Clark County there are three weather stations available that reported thunderstorm events during the time frame of 1942 - 2006. The reporting stations were Indian Springs, Las Vegas, and Nellis. These events were recorded hourly, so some days could have several readings for thunderstorm activity. A summary of the three stations events by type break down as follows:

- Dry Thunderstorms - 1377
- Thunderstorms w/o Hail - 310
- Heavy Thunderstorms w/o Hail - 3
- Total Hourly recordings – 1690

The majority of these observations were made at the Las Vegas station. These numbers equate to over **26 thunderstorms per year**, with **81% being reported as dry thunderstorms**; which are a great concern for fire ignition.

Douglas County:
None of the stations in Douglas County reported thunderstorm events.

Elko County:
Within Elko County there are four weather stations available that reported thunderstorm events during the time frame of 1977 - 2006. The reporting stations were Elko AP, Wells, Wildhorse Reservoir, and Owyhee; with Elko AP being the only one to have a complete record for the entire time span. These events were recorded hourly, so some days could have several readings for thunderstorm activity. A summary of the four stations events by type break down as follows:

- Dry Thunderstorms - 932
- Thunderstorms w/o Hail - 204
- Thunderstorms w/ Hail - 2
- Heavy Thunderstorms w/o Hail - 1
- Total Hourly recordings – 1139

The majority of these observations were made at the Elko AP station. These numbers equate to nearly **38 thunderstorms per year**, with roughly **82% being**

reported as dry thunderstorms; which are a great concern for fire ignition.

Esmeralda County:
Within Esmeralda County there were not any stations reporting thunderstorm activity.

Eureka County:
Within Eureka County there was one weather station available that reported thunderstorm events during the time frame of 1992 - 2005. The reporting station was at Eureka. No thunderstorms were reported at this station during this time span.

Humboldt County:
Within Humboldt County there is one weather station available that reported thunderstorm events during the time frame of 1959 - 1972. The reporting station was Winnemucca AP. These events were recorded hourly, so some days could have several readings for thunderstorm activity. A summary of the station events by type break down as follows:

- Dry Thunderstorms – 0
- Thunderstorms w/o Hail – 161
- Thunderstorms w/ Hail – 0
- Heavy Thunderstorms w/o Hail – 0
- Total Hourly recordings - 161

These numbers equate to over **12 thunderstorms per year**, which are a great concern for fire ignition.

Lander County:
Within Lander County there are two weather stations available that reported thunderstorm events during the time frame of 1973 - 2006. The reporting stations were Austin and Battle Mountain. These events were recorded hourly, so some days could have several readings for thunderstorm activity. A summary of the two stations events by type break down as follows:

- Dry Thunderstorms - 472
- Thunderstorms w/o Hail - 293
- Total Hourly recordings – 765

The majority of these observations were made at the Battle Mountain station. These numbers equate to over **23 thunderstorms per year**, with roughly **62% being reported as dry thunderstorms**; which are a great concern for fire ignition.

Lincoln County:
Within Lincoln County there was one weather station available that reported thunderstorm events during the time frame of 1977 - 2002; Caliente. At the Caliente station there weren't any thunderstorms reported.

Lyon County:
Within Lyon County there were not any stations available that were reporting thunderstorm activity.

Mineral County:
Within Mineral County there were not any stations available that reported thunderstorm activity.

Nye County:
Within Nye County there are three weather stations available that reported thunderstorm events during the time frame of 1942 - 2006. The reporting stations are Yucca Flats, Tonopah and Mercury Desert Rock AP, with Tonopah spanning the entire time frame. These events were recorded hourly, so some days could have several readings for thunderstorm activity. A summary of the two stations events by type break down as follows:

- Dry Thunderstorms - 1753
- Thunderstorms w/o Hail - 872
- Thunderstorms w/ Hail - 3
- Heavy Thunderstorms w/o Hail - 28
- Total Hourly recordings – 2656

The majority of these observations were made at the Elko AP station. These numbers equate to nearly **42 thunderstorms per year**, with roughly **66% being reported as dry thunderstorms**; which are a great concern for fire ignition.

Pershing County:
Within Pershing County there is one weather station available that reports thunderstorm events during the time frame of 1948 - 2006. The reporting station is Lovelock Derby Field. These events were recorded hourly, so some days could have several readings for thunderstorm activity. A summary of the four stations events by type break down as follows:

- Dry Thunderstorms - 334
- Thunderstorms w/o Hail - 261
- Thunderstorms w/ Hail - 1
- Heavy Thunderstorms w/o Hail - 2
- Total Hourly recordings - 598

These numbers equate to over **10 thunderstorms per year**, with roughly **56% being reported as dry thunderstorms**; which are a great concern for fire ignition.

Storey County:
Within Storey County there were not any stations reporting thunderstorm activity.

Washoe County:
Within Washoe County there are two weather stations available that reported thunderstorm events during the time frame of 1943 - 2006. The reporting stations were Reno AP and Stead AFB, with Reno being the only one to have a complete record for the entire time span. These events were recorded hourly, so some days could have several readings for thunderstorm activity. A summary of the two stations

events by type break down as follows:

- Dry Thunderstorms - 679
- Thunderstorms w/o Hail - 514
- Normal Thunderstorms - 27
- Heavy Thunderstorms w/o Hail - 3
- Total Hourly recordings - 1223

The majority of these observations were made at the Elko AP station. These numbers equate to nearly **20 thunderstorms per year**, with roughly **56% being reported as dry thunderstorms** which are a great concern for fire ignition.

White Pine County
Within White Pine County there is one weather station available that reported thunderstorm events during the time frame of 1953 - 2006; Ely Yelland Field. These events were recorded hourly, so some days could have several readings for thunderstorm activity. A summary of the four stations events by type break down as follows:

- Dry Thunderstorms - 2035
- Normal Thunderstorms - 98
- Thunderstorms w/o Hail - 885
- Thunderstorms w/ Hail - 2
- Heavy Thunderstorms w/o Hail - 5
- Heavy Thunderstorms w/ Hail - 1
- Total Hourly recordings - 3026

The majority of these observations were made at the Elko AP station. These numbers equate to a little over **57 thunderstorms per year**, with roughly **67% being reported as dry thunderstorms**; which is a great concern for fire ignition.

Severe Wind (events greater than 58 mph) by County

Wind event data for Storey and Lyon Counties was not found.

Location	Number of Events	Average per Year
Carson City	7	1.75

Churchill County:

Location	Number of Events	Average per Year
Dead Camel Mountain	53	2.94
Hawthorne	0	0.00
Fallon NAS	11	0.37

Clark County:

Location	Number of Events	Average per Year
Big Bend	18	2.00
Christmas Tree Pass	5	1.00
Desert NWR	60	15.0
Kyle Canyon	32	4.00
Mountain Springs	15	2.00
Red Rock	94	5.70
Las Vegas AP	2	0.07
Indian Springs	15	0.94
Nellis AFB	8	0.27

Douglas County:

Location	Number of Events	Average per Year
Fish Springs	18	0.9474
Mt. Como	21	6.0000

Elko County:

Location	Number of Events	Average per Year
Antelope Lake	18	1.24
Crane Springs	16	1.88
Independence Valley	1	0.33
Long Hollow	57	3.00
Lower Dixie	2	1.00
Red Point	47	4.70
Rock Spring Creek	26	1.68
Ruby Lake NWR	8	2.29
Ruby Valley	101	50.5
Spring Gulch	59	3.58
Spruce Mountain	33	1.65
Stag Mountain	9	1.00
Elko AP	11	0.37
Owyhee	2	0.14

Wells	3	0.60
Wildhorse Reservoir	5	0.27

Esmeralda County:

Location	Number of Events	Average per Year
Oriental Wash	9	0.47
Royston Hills	28	2.80

Eureka County:

Location	Number of Events	Average per Year
Bailey Ranch	80	7.27
Coils Creek	14	0.88
Combs Canyon	23	1.21
Emigrant Canyon	13	4.33
Flat Spring	141	23.5
Palisade	86	12.3
Eureka	9	0.33

Humboldt County:

Location	Number of Events	Average per Year
Burma Spring	11	1.47
Dry Canyon	18	0.92
Morey Creek	259	25.9
Texas Spring	54	3.27
Winnemucca	2	0.07

Lander County:

Location	Number of Events	Average per Year
Argenta	18	6.00
Austin	78	14.2
Beacon Light	12	0.75
Desatoya Mountain	40	2.11
Red Butte	14	0.88
Battle Mountain	9	0.56

Lincoln County:

Location	Number of Events	Average per Year
Buckhorn Ranch	13	2.17
Caliente	13	2.60
Coyote Wash	23	1.21
Immigration Wash	13	0.81
Kane Springs	195	10.3
Toquop Wash	4	0.50

Mineral County:

Location	Number of Events	Average per Year
Brawley Peaks	168	7.47

Nye County:

Location	Number of Events	Average per Year
Currant Creek	44	2.67
Garden Valley	23	2.30
Pahrump	96	9.60
Pancake	48	4.80
San Juan	2	0.50

Pershing County:

Location	Number of Events	Average per Year
Bluewing Mountain	21	1.08
Coyote Canyon	29	3.87
Siard	32	1.56
Lovelock	21	0.70

Washoe County:

Location	Number of Events	Average per Year
Barrel Springs	18	1.29
Buffalo Creek	15	1.00
Catnip Mountain	53	2.47
Desert Springs	57	2.92
Fox Mountain	7	0.44
Juniper Springs	4	0.29
Little Valley	47	11.8

Reno AP	8	0.27
Stead	0	0.00

White Pine County:

Location	Number of Events	Average per Year
Alligator Ridge	110	6.67
Cedar Pass	14	0.85
Ely	10	1.67
Mather	305	17.4
McGill Junction	37	3.36
Paris	2	0.67

The Noxious Weed species distribution maps for the State that were in this Appendix in the last iteration have been replaced by a reference to the website at the following link, where the most up-to-date maps are available and maintained by the Nevada Natural Heritage Program of the Nevada Department of Agriculture:

http://agri.nv.gov/Plant/Noxious_Weeds/speciesdist_maps/

APPENDIX M Earthquake Vulnerability by County & Statewide

Estimated Losses from Earthquakes near Nevada Communities, 2009, by Jonathan G. Price, Gary Johnson, Christine M. Ballard, Heather Armeno, Irene Seelye, Linda D. Goar, Craig M. dePolo, and Jordan T. Hastings

Available online at the following link:

http://www.nbmg.unr.edu/dox/of098/Scenarios/OpenFileReport09-8.pdf

Nevada Bureau of Mines and Geology Open-File Report 09-8

Estimated Losses from Earthquakes near Nevada Communities

Jonathan G. Price, Gary Johnson, Christine M. Ballard, Heather Armeno,
Irene Seeley, Linda D. Goar, Craig M. dePolo, and Jordan T. Hastings

2009

This report is available as an online document at www.nbmg.unr.edu.
Please use links on the tables to view summary reports for scenarios involving
earthquakes of magnitude 5.0, 5.5, 6.0, 6.5, and 7.0
for 38 communities in Nevada.

APPENDIX M Earthquake Vulnerability by County & Statewide

Estimated Losses from Earthquakes near Nevada Communities

This report estimates losses from earthquakes that could occur near thirty-eight Nevada communities, including all county seats and major population centers (figure 1). The report uses the Federal Emergency Management Agency's sophisticated loss-estimation computer model, HAZUS-MH, to estimate such factors as total economic loss, numbers of buildings receiving extensive to complete damage, number of people needing public shelter and hospital care, and number of fatalities from earthquakes of magnitude 5.0, 5.5, 6.0, 6.5, and 7.0. The report also tabulates earthquake probabilities for these communities from the U.S. Geological Survey's probabilistic seismic hazard analysis (table 1).

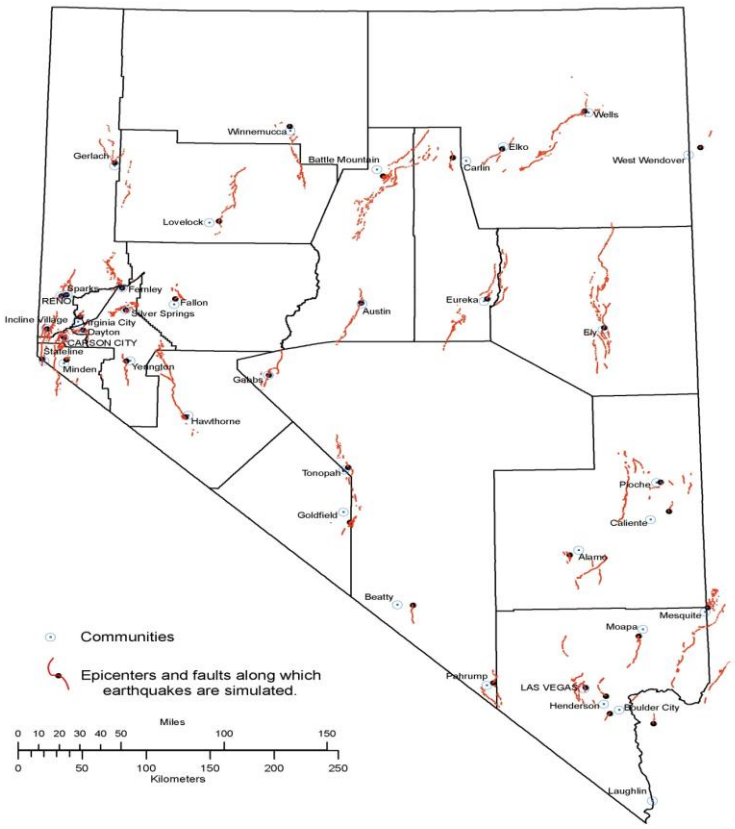
The primary audiences for this report are emergency managers, emergency responders, and the local and state government officials responsible for action after a natural disaster. HAZUS reports have been quite helpful in response and recovery planning and exercises, identifying opportunities for mitigation, and, in the case of an actual earthquake, providing the Governor, through the Chief of the Nevada Division of Emergency Management, with an early estimate of the likely severity of the event. Such information can be critical to decisions regarding disaster declarations, a timely and appropriate emergency response, and securing resources that will be necessary during recovery. Because the report covers many of the likely earthquakes that could affect Nevada communities, it serves as an immediate reference against which the HAZUS output produced by the Nevada Bureau of Mines and Geology immediately after an earthquake can be compared. Another important audience for this report is the general public, including homeowners, operators of businesses, and individuals responsible for the wellbeing of others.

Earthquakes are inevitable. The report demonstrates that the consequences of earthquakes can be huge in Nevada, particularly if individuals are not prepared. Recommendations on what to do before, during, and after an earthquake are provided by dePolo and others (2000) and on various websites of the Nevada Bureau of Mines and Geology (http://www.nbmg.unr.edu/EQ/earthquakes.htm), Nevada Seismological Laboratory (http://www.seismo.unr.edu/), and U.S. Geological Survey (http://earthquake.usgs.gov/). The version of HAZUS-MH (Federal Emergency Management Agency, 2003 and 2004) used for this report was documented by Johnson (2009). Given an earthquake location, depth, and magnitude, HAZUS estimates amounts of various types of economic and social loss. We chose 38 communities that include all the major population centers in each of Nevada's 17 counties (figure 1). Some communities were not explicitly in the tabulations, because the effects of earthquakes near those cities and towns are included in the effects of nearby communities. For example, losses in North Las Vegas are included in the scenarios for Las Vegas, Henderson, and Boulder City. For earthquake scenarios for each community, we chose the closest Quaternary fault on the map of dePolo (2008). Quaternary is the name of a geological time period; these faults moved more recently than approximately two million years ago and are likely candidates for future earthquakes. The epicenters of the earthquakes were chosen at the fault position that is closest to the community. A depth of 10 kilometers (6 miles) was used for each scenario.

APPENDIX M Earthquake Vulnerability by County & Statewide

We chose magnitudes from 5.0 to 7.0 to illustrate the variation that magnitude has on losses. Earthquakes larger than magnitude 7.0 have occurred in Nevada (dePolo and dePolo, 1999; dePolo and others, 2000) and will occur here in the future. That is, damages could be even more than listed in this report.

Figure 3-37. Locations of the 38 communities in Nevada for which HAZUS earthquake scenarios have been developed



Note: The faults chosen for the earthquake scenarios are also shown. The epicenters of the earthquakes were chosen at the fault position that is closest to the community.

Figure 1. Location of the 38 communities in Nevada for which HAZUS earthquake scenarios have been developed. The faults chosen for the earthquake scenarios are also shown. The epicenters of the earthquakes were chosen at the fault position that is closest to the community.

APPENDIX M Earthquake Vulnerability by County & Statewide

Table 1. Probabilities of earthquakes of various magnitudes occurring within 50 years within 50 kilometers (31 miles) of major communities in Nevada.

County	County seat *or other*	% Probability of magnitude greater than or equal to					Rank by Probability
		5.0	5.5	6.0	6.5	7.0	
Carson City	**Carson City**	**>90**	**~80**	**70**	**50-55**	**12-15**	**2**
Churchill	Fallon	80-90	~60	35	20-25	6-8	14
Clark	Las Vegas	40-50	~30	12	4-5	<0.5	28
	Boulder City	50-60	~30	12	4-5	<0.5	23
	Henderson	50-60	~30	12	4-5	<0.5	23
	Laughlin	10-20	~5	2-3	0.5-1	<0.5	38
	Mesquite	20-30	~15	4-6	2	<0.5	35
	Moapa	40-50	~25	10	4-5	<0.5	30
Douglas	**Minden**	**>90**	**~80**	**67**	**50-60**	**10-12**	**6**
	Stateline	**>90**	**~80**	**60-70**	**40-50**	**10**	**9**
Elko	Elko	30-40	~25	10-15	6-8	0.5-1	31
	Carlin	40-50	~30	10-15	6-8	0.5-1	27
	Wells	30-40	~20	9	6	0.5-1	32
	West Wendover	20	~10	4	1-2	<0.5	37
Esmeralda	Goldfield	80-90	~55	20-30	5-10	<1	15
Eureka	Eureka	40-50	~30	10-15	4-6	<0.5	28
Humboldt	Winnemucca	50-60	~35	15-20	5-10	1-1.5	22
Lander	Battle Mountain	60-70	~40	18	10	1.5	20
	Austin	60-70	~40	20	10-15	2-3	19
Lincoln	Pioche	30-40	~20	6-10	2-3	<0.5	33
	Alamo	70-80	~50	20-25	6-8	<0.5	17
	Caliente	50-60	~35	10-15	4	<0.5	23
Lyon	**Yerington**	**>90**	**~75**	**60**	**40-45**	**12**	**8**
	Dayton	**>90**	**~80**	**70-75**	**50-55**	**15-18**	**1**
	Fernley	90	~70	48	35	8	12
	Silver Springs	**>90**	**~70**	**50-60**	**30-40**	**10-12**	**11**
Mineral	**Hawthorne**	**>90**	**~75**	**61**	**30-40**	**10-12**	**10**
Nye	Tonopah	70-80	~50	20-30	5-10	<1	17
	Beatty	70-80	~55	30-40	20-30	10-12	16
	Gabbs	90	~65	40-50	20-25	6-8	13
	Pahrump	30-40	~25	5-10	3	<1	33
Pershing	Lovelock	50-60	~35	10-20	10	1-2	21
Storey	**Virginia City**	**>90**	**~80**	**70**	**50**	**12-15**	**3**
Washoe	**Reno**	**>90**	**~80**	**67**	**50**	**12-15**	**4**
	Gerlach	40	~25	10-15	6-10	2-3	26
	Incline Vilage	**>90**	**~80**	**60-70**	**40-50**	**10-12**	**7**
	Sparks	**>90**	**~80**	**67**	**50**	**12-15**	**4**
White Pine	Ely	20-30	~15	4-6	1.5-2	<0.5	35

Data are taken from maps produced by the U.S. Geological Survey at http://eqint.cr.usgs.gov/eqprob/2002/index.php. Values for magnitude 5.5 are extrapolated between values for magnitudes 5.0 and 6.0.

APPENDIX M Earthquake Vulnerability by County & Statewide

Five magnitudes for each of 38 communities amount to 190 individual earthquake scenarios, for which we produced separate HAZUS summary reports. Because many of these earthquakes would affect multiple counties or multiple states, we also produced separate summary reports such that the user can view the estimated losses for the county in which the earthquake occurred, for the entire state, or, if applicable, for a multi-state region. For each community, we created one page with tables summarizing total economic loss, numbers of buildings receiving extensive to complete damage, number of people needing public shelter and hospital care, and number of fatalities for the five magnitudes. These 38 pages are arranged alphabetically by community name. The individual 20-page summary reports are available online through links on these pages.

Table 2 lists the total economic losses estimated by HAZUS for magnitude 6.0 earthquakes near each of the 38 communities. This magnitude is significant, because that was the size of the 21 February 2008 earthquake near Wells, Nevada. When developing the HAZUS program, the Federal Emergency Management Agency calibrated it against known losses from earthquakes in California in the 1980s and early 1990s. When HAZUS has been run for significant earthquakes that have occurred in the United States since then, the scenario results have generally been within a factor of two or three of reality. On the basis of sensitivity analyses that we have performed and of uncertainties in locating and measuring magnitudes of earthquakes and in local soil and geological conditions, basin effects, direction in which the seismic waves travel, how well buildings have been retrofitted to withstand earthquakes, and number of visitors in Nevada at the time of the earthquake, we feel that the numbers could vary by a factor of ten. Our current best estimate of the total economic loss from the Wells Earthquake is a bit more than $9 million, about one third of the value estimated by HAZUS.

Links from tables 1 and 2 take the user to the single pages with tables summarizing losses for each community, from which further links take the user to over 400 separate HAZUS summary reports. The individual HAZUS summary reports include the following sections and subsections:

- General Description of the Region
  - Building and Lifeline Inventory
  - Building Inventory
    - Critical Facility Inventory
    - Transportation and Utility Lifeline Inventory
- Earthquake Scenario Parameters
    - Direct Earthquake Damage
    - Buildings Damage
    - Critical Facilities Damage
    - Transportation and Utility Lifeline Damage
- Induced Earthquake Damage
    - Fire Following Earthquake
    - Debris Generation

Social Impact
- Shelter Requirements
- Casualties

Economic Loss
- Building Losses
- Transportation and Utility Lifeline Losses
- Long-term Indirect Economic Impacts

Appendix listing population and building value data for counties included in the region

Tables 1 and 2 demonstrate that significant earthquake hazards exist throughout Nevada and that the potential losses from earthquakes are high for many communities. The magnitude 6.0 Wells Earthquake serves as a call for action. The probability that an earthquake of that magnitude or greater will occur in the Las Vegas area is 1.3 times higher than the probability for Wells, and the probability of such an earthquake in the Reno-Sparks-Carson City-Lake Tahoe-Minden area is approximately seven times higher than for Wells. The consequences for our major urban areas are enormous-billions of dollars for such an event in either urban area.

Although the risks are locally huge, actions can be taken to reduce those risks. Current building codes no longer allow construction of the types of unreinforced masonry buildings that collapsed in Wells. Over time, the remaining unreinforced masonry buildings in Nevada can be replaced, taken out of service for human occupation, or retrofitted. The HAZUS summary reports for individual earthquake scenarios indicate that much of the damage will be non-structural in nature – that is, not a collapsed building but damage from falling exterior facades, interior light fixtures, and bookshelves; broken china, glassware, pictures, and computers; and ruptured gas and water lines. These non-structural hazards can often be mitigated inexpensively.

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Federal Emergency Management Agency, 2004, *Using HAZUS-MH for risk assessment, how-to guide,* HAZUS®-MH Risk Assessment and User Group Series, FEMA 433, 5 chapters: Electronic document available at http://www.fema.gov/library/viewRecord.do?id=1985.

Ballard, C.M., Johnson, G., and Hastings, J. T., 2009, Nevada Statewide HAZUS Database Update: HAZUS-MH for Nevada: Nevada Bureau of Mines and Geology Open-File Report 09-7, 2 p.

APPENDIX M Earthquake Vulnerability by County & Statewide

Table 2. HAZUS estimates for total economic loss from a magnitude 6.0 earthquake on a fault close to the communities and probabilities of earthquakes of this size or greater occurring within 50 years and within 50 kilometers (31 miles) of the communities.

County	County seat *or other community*	Total economic loss	% Probability	Rank by Loss
Carson City	**Carson City**	**$650,000,000**	**70**	**6**
Churchill	Fallon	$110,000,000	35	13
Clark	**Las Vegas**	**$7,200,000,000**	**12**	**1**
	Boulder City	**$1,400,000,000**	**12**	**5**
	Henderson	**$2,500,000,000**	**12**	**2**
	Laughlin	$79,000,000	2-3	16
	Mesquite	$59,000,000	4-6	19
	Moapa	$94,000,000	10	14
Douglas	Minden	$340,000,000	67	10
	Stateline	$590,000,000	60-70	7
Elko	Elko	$160,000,000	10-15	12
	Carlin	$9,800,000	10-15	35
	Wells	$30,000,000	9	25
	West Wendover	$19,000,000	4	29
Esmeralda	Goldfield	$13,000,000	20-30	33
Eureka	Eureka	$34,000,000	10-15	24
Humboldt	Winnemucca	$46,000,000	15-20	21
Lander	Battle Mountain	$18,000,000	18	31
	Austin	$26,000,000	20	26
Lincoln	Pioche	$20,000,000	6-10	28
	Alamo	$5,100,000	20-25	37
	Caliente	$12,000,000	10-15	34
Lyon	Yerington	$56,000,000	60	20
	Dayton	$340,000,000	70-75	11
	Fernley	$62,000,000	48	17
	Silver Springs	$60,000,000	50-60	18
Mineral	Hawthorne	$24,000,000	61	27
Nye	Tonopah	$18,000,000	20-30	30
	Beatty	$6,500,000	30-40	36
	Gabbs	$2,600,000	40-50	38
	Pahrump	$84,000,000	5-10	15
Pershing	Lovelock	$17,000,000	10-20	32
Storey	Virginia City	$490,000,000	70	9
Washoe	**Reno**	**$1,900,000,000**	**67**	**3**
	Gerlach	$39,000,000	10-15	23
	Incline Village	$510,000,000	60-70	8
	Sparks	**$1,800,000,000**	**67**	**4**
White Pine	Ely	$44,000,000	4-6	22

APPENDIX M Earthquake Vulnerability by County & Statewide

Disclaimer

The information in this report should be considered preliminary and approximate. It has not been thoroughly edited or peer reviewed. All numbers in this report are estimates derived from HAZUS, the Federal Emergency Management Agency's loss-estimation model. Individual numbers may vary by a factor of 10, depending on location, depth, and magnitude of the earthquake and on other factors, including, among others, local soil and geological conditions, basin effects, direction in which the seismic waves travel, how well buildings have been retrofitted to withstand earthquakes, and number of visitors in Nevada at the time of the earthquake.

Note: To view the links in this report, you should have a minimum of Adobe Reader 9.0 installed on your computer. Adobe Reader 9.0 is a free download and can be downloaded from this site: http://get.adobe.com/reader/

Alamo, Nevada

Epicenter at 1 15.24° W longitude, 37.31° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Lincoln County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	0	0	0	0	2
People needing public shelter	0	0	0	0	0
People needing hospital care	0	0	0	0	0
Fatalities	0	0	0	0	0
Total economic loss ($ million)	0.60	0.97	1.7	2.8	5.5

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	0	0	2	20	96
People needing public shelter	0	0	0	5	20
People needing hospital care	0	0	0	2	6
Fatalities	0	0	0	0	0
Total economic loss ($ million)	0.61	1.0	5.1	38	140

Austin, Nevada

Epicenter at 1 17.08° W longitude, 39.49° N latitude; depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Lander County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	2	10	64	130	180
People needing public shelter	0	0	0	0	0
People needing hospital care	0	0	0	1	1
Fatalities	0	0	0	0	0
Total economic loss ($ million)	2.0	7.0	25	60	110

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	2	10	64	130	180
People needing public shelter	0	0	0	1	1
People needing hospital care	0	0	0	1	1
Fatalities	0	0	0	0	0
Total economic loss ($ million)	2.1	7.2	26	63	120

Battle Mountain, Nevada

Epicenter at 1 16.88° W longitude, 40.58° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Lander County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	4	18	160	550	830
People needing public shelter	0	0	0	3	5
People needing hospital care	0	0	1	6	10
Fatalities	0	0	0	1	3
Total economic loss ($ million)	2.0	5.3	17	49	81

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	4	18	160	560	830
People needing public shelter	0	0	0	3	5
People needing hospital care	0	0	1	6	10
Fatalities	0	0	0	1	3
Total economic loss ($ million)	2.1	5.7	18	55	98

APPENDIX M Earthquake Vulnerability by County & Statewide

Beatty, Nevada

Epicenter at 1 16.62°W longitude, 36.89°N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Nye County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	2	9	59	200	360
People needing public shelter	0	0	0	0	1
People needing hospital care	0	0	0	0	1
Fatalities	0	0	0	0	0
Total economic loss ($ million)	0.68	2.0	6.0	16	35

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	2	9	59	200	370
People needing public shelter	0	0	0	0	5
People needing hospital care	0	0	0	1	3
Fatalities	0	0	0	0	0
Total economic loss ($ million)	0.69	2.0	6.2	21	64

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	2	9	59	200	370
People needing public shelter	0	0	0	0	5
People needing hospital care	0	0	0	1	0
Fatalities	0	0	0	0	0
Total economic loss ($ million)	0.71	2.1	6.5	22	69

Boulder City, Nevada

Epicenter at 1 14.92°W longitude, 35.95°N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Clark County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	82	430	2,400	9,600	24,000
People needing public shelter	5	31	180	1,300	3,800
People needing hospital care	3	12	72	460	1,700
Fatalities	0	1	13	110	430
Total economic loss ($ million)	120	410	1,300	4,000	8,900

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	89	460	2,600	9,600	24,000
People needing public shelter	9	50	280	1,300	3,800
People needing hospital care	3	15	87	460	1,700
Fatalities	0	2	16	110	430
Total economic loss ($ million)	130	430	1,400	4,000	8,900

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	89	460	2,600	9,700	24,000
People needing public shelter	9	50	280	1,300	3,800
People needing hospital care	3	15	87	460	1,700
Fatalities	0	2	16	110	430
Total economic loss ($ million)	130	430	1,400	4,000	8,900

Caliente, Nevada

Epicenter at 1 14.35° W longitude, 37.67° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Lincoln County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	0	3	20	92	280
People needing public shelter	0	0	0	1	6
People needing hospital care	0	0	0	1	6
Fatalities	0	0	0	0	1
Total economic loss ($ million)	0.87	2.8	10	33	85

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	0	3	20	94	300
People needing public shelter	0	0	0	2	11
People needing hospital care	0	0	0	1	7
Fatalities	0	0	0	0	1
Total economic loss ($ million)	0.88	2.9	10	35	120

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	0	3	22	100	330
People needing public shelter	0	0	0	2	12
People needing hospital care	0	0	0	1	8
Fatalities	0	0	0	0	2
Total economic loss ($ million)	0.90	3.2	12	43	140

Carlin, Nevada

Epicenter at 1 16.23° W longitude, 40.73° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Elko County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	0	2	13	55	160
People needing public shelter	0	0	0	0	2
People needing hospital care	0	0	0	2	7
Fatalities	0	0	0	0	2
Total economic loss ($ million)	0.43	1.7	5.6	17	41

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	0	2	13	57	170
People needing public shelter	0	0	0	0	2
People needing hospital care	0	0	0	2	8
Fatalities	0	0	0	0	2
Total economic loss ($ million)	0.79	3.0	9.8	29	67

Carson City, Nevada

Epicenter at 1 19.76° W longitude, 39.16° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Carson City County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	52	210	950	2,000	2,700
People needing public shelter	5	20	73	170	230
People needing hospital care	2	7	39	110	180
Fatalities	0	1	9	28	48
Total economic loss ($ million)	67	160	370	690	950

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	60	260	1,300	3,400	8,000
People needing public shelter	6	23	89	250	760
People needing hospital care	2	9	48	160	500
Fatalities	0	2	11	39	130
Total economic loss ($ million)	85	230	610	1,500	3,700

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	60	270	1,300	3,500	8,400
People needing public shelter	6	24	91	260	810
People needing hospital care	2	9	48	160	520
Fatalities	0	2	11	39	140
Total economic loss ($ million)	87	240	650	1,600	4,000

Dayton, Nevada

Epicenter at 1 19.60° W longitude, 39.23° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Lyon County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	14	60	290	610	920
People needing public shelter	0	0	3	8	13
People needing hospital care	0	1	7	20	33
Fatalities	0	0	2	5	8
Total economic loss ($ million)	9.8	24	55	110	160

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	25	130	680	2,100	5,300
People needing public shelter	1	7	33	130	420
People needing hospital care	1	3	17	68	250
Fatalities	0	1	3	15	63
Total economic loss ($ million)	32	110	330	940	2,300

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	25	130	690	2,200	5,400
People needing public shelter	1	7	33	130	430
People needing hospital care	1	3	18	68	260
Fatalities	0	1	3	15	63
Total economic loss ($ million)	32	110	340	970	2,500

Elko, Nevada

Epicenter at 1 15.77°W longitude, 40.81°N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Elko County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	19	74	390	960	1,800
People needing public shelter	1	6	31	71	110
People needing hospital care	1	2	21	63	120
Fatalities	0	1	5	17	32
Total economic loss ($ million)	21	50	160	340	540

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	19	74	390	960	1,800
People needing public shelter	1	6	31	71	110
People needing hospital care	1	2	21	63	120
Fatalities	0	1	5	17	32
Total economic loss ($ million)	21	50	160	340	540

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	19	74	390	960	1,800
People needing public shelter	1	6	31	71	110
People needing hospital care	1	2	21	63	120
Fatalities	0	1	5	17	32
Total economic loss ($ million)	21	50	160	340	540

Ely, Nevada

Epicenter at 1 14.88° W longitude, 39.26° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **White Pine County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	7	27	150	390	680
People needing public shelter	0	0	2	8	18
People needing hospital care	0	0	2	11	25
Fatalities	0	0	1	3	7
Total economic loss ($ million)	5.3	14	44	120	230

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	7	27	150	390	680
People needing public shelter	0	0	2	8	18
People needing hospital care	0	0	2	11	25
Fatalities	0	0	1	3	7
Total economic loss ($ million)	5.3	14	44	120	230

Eureka, Nevada

Epicenter at 1 15.93° W longitude, 39.52° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Eureka County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	7	29	170	340	460
People needing public shelter	0	0	0	2	4
People needing hospital care	0	0	2	7	12
Fatalities	0	0	0	2	3
Total economic loss ($ million)	3.9	10	34	76	130

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	7	29	170	340	460
People needing public shelter	0	0	0	2	4
People needing hospital care	0	0	2	7	12
Fatalities	0	0	0	2	3
Total economic loss ($ million)	3.9	10	34	78	130

Fallon, Nevada

Epicenter at 1 18.77°W longitude, 39.51°N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Churchill County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	12	48	250	570	970
People needing public shelter	0	3	14	30	43
People needing hospital care	0	1	7	20	33
Fatalities	0	0	2	5	8
Total economic loss ($ million)	19	45	100	190	280

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	12	49	250	590	1,100
People needing public shelter	0	3	14	31	46
People needing hospital care	0	1	8	20	34
Fatalities	0	0	2	5	9
Total economic loss ($ million)	19	45	110	210	340

Fernley, Nevada

Epicenter at 1 19.25° W longitude, 39.60° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Lyon County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	5	22	130	420	1,400
People needing public shelter	0	0	2	7	15
People needing hospital care	0	0	2	8	22
Fatalities	0	0	0	2	5
Total economic loss ($ million)	4.9	13	35	77	170

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	5	27	150	510	1,700
People needing public shelter	0	1	5	14	34
People needing hospital care	0	1	3	10	30
Fatalities	0	0	1	2	6
Total economic loss ($ million)	5.9	21	62	170	410

Gabbs, Nevada

Epicenter at 117.91° W longitude, 38.87° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Nye County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	0	0	0	1	2
People needing public shelter	0	0	0	0	0
People needing hospital care	0	0	0	0	0
Fatalities	0	0	0	0	0
Total economic loss ($ million)	0.59	0.98	1.8	3.2	6.2

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	0	0	1	3	19
People needing public shelter	0	0	0	0	0
People needing hospital care	0	0	0	0	0
Fatalities	0	0	0	0	0
Total economic loss ($ million)	0.63	1.1	2.6	7.0	21

Gerlach, Nevada

Epicenter at 1 19.36° W longitude, 40.67° N latitude; depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Washoe County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	2	10	56	130	190
People needing public shelter	0	0	1	3	6
People needing hospital care	0	0	1	2	5
Fatalities	0	0	0	1	1
Total economic loss ($ million)	4.3	13	39	93	160

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	2	10	56	140	200
People needing public shelter	0	0	1	3	6
People needing hospital care	0	0	1	3	5
Fatalities	0	0	0	1	1
Total economic loss ($ million)	4.3	13	39	95	170

Goldfield, Nevada

Epicenter at 1 17.17° W longitude, 37.61° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Esmeralda County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	1	5	43	150	220
People needing public shelter	0	0	0	0	0
People needing hospital care	0	0	0	1	1
Fatalities	0	0	0	0	0
Total economic loss ($ million)	1.2	3.2	11	36	66

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	1	5	44	150	250
People needing public shelter	0	0	0	0	1
People needing hospital care	0	0	0	1	1
Fatalities	0	0	0	0	0
Total economic loss ($ million)	1.2	3.5	13	41	89

Hawthorne, Nevada

Epicenter at 1 18.65° W longitude, 38.50° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Mineral County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	6	26	120	230	320
People needing public shelter	0	0	2	5	8
People needing hospital care	0	0	1	3	6
Fatalities	0	0	0	1	1
Total economic loss ($ million)	4.2	10	23	42	61

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	6	26	120	240	340
People needing public shelter	0	0	2	6	9
People needing hospital care	0	0	1	3	6
Fatalities	0	0	0	1	1
Total economic loss ($ million)	4.2	10	23	49	84

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	6	26	120	240	340
People needing public shelter	0	0	2	5	9
People needing hospital care	0	0	1	3	6
Fatalities	0	0	0	1	1
Total economic loss ($ million)	4.2	10	24	50	89

APPENDIX M Earthquake Vulnerability by County & Statewide

Henderson, Nevada

Epicenter at 1 14.95° W longitude, 36.10° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Clark County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	170	840	4,900	17,000	30,000
People needing public shelter	25	130	700	2,500	5,100
People needing hospital care	6	29	36	900	2,400
Fatalities	1	4	36	220	630
Total economic loss ($ million)	260	800	2,500	6,300	11,000

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	170	840	4,900	17,000	30,000
People needing public shelter	25	130	700	2,500	5,100
People needing hospital care	6	29	180	900	2,400
Fatalities	1	4	36	220	630
Total economic loss ($ million)	260	800	2,500	6,300	11,000

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	170	840	4,900	17,000	31,000
People needing public shelter	25	130	700	2,500	5,100
People needing hospital care	6	29	180	900	2,400
Fatalities	1	4	36	220	630
Total economic loss ($ million)	260	800	2,500	6,300	11,000

Incline Village, Nevada

Epicenter at 1 19.92°W longitude, 39.23°N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Washoe County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	10	44	190	850	4,100
People needing public shelter	1	6	26	110	550
People needing hospital care	1	3	13	54	280
Fatalities	0	0	3	12	71
Total economic loss ($ million)	33	100	290	830	2,500

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	14	75	360	1,600	6,000
People needing public shelter	2	9	38	150	670
People needing hospital care	1	4	19	81	350
Fatalities	0	1	4	19	89
Total economic loss ($ million)	44	140	420	1,200	3,300

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	15	85	420	1,900	7,400
People needing public shelter	2	10	43	180	820
People needing hospital care	1	4	21	88	420
Fatalities	0	1	4	20	110
Total economic loss ($ million)	50	170	510	1,500	4,100

Las Vegas, Nevada

Epicenter at 1 15.12° W longitude, 36.17° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Clark County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	640	2,700	15,000	38,000	60,000
People needing public shelter	170	690	3,600	8,700	13,000
People needing hospital care	32	140	1,100	4,300	8,100
Fatalities	4	24	280	1,200	2,300
Total economic loss ($ million)	870	2,300	7,200	16,000	25,000

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	640	2,700	15,000	38,000	60,000
People needing public shelter	170	690	3,600	8,700	13,000
People needing hospital care	32	140	1,100	4,300	8,100
Fatalities	4	24	280	1,200	2,300
Total economic loss ($ million)	870	2,300	7,200	16,000	25,000

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	640	2,700	15,000	38,000	60,000
People needing public shelter	170	690	3,600	8,700	13,000
People needing hospital care	32	140	1,100	4,300	8,100
Fatalities	4	24	280	1,200	2,300
Total economic loss ($ million)	870	2,300	7,200	16,000	25,000

Laughlin, Nevada

Epicenter at 1 14.54° W longitude, 35.85° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Clark County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	1	11	55	280	970
People needing public shelter	0	2	9	36	120
People needing hospital care	0	1	3	11	34
Fatalities	0	0	0	1	4
Total economic loss ($ million)	1.5	18	72	250	690

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	1	11	55	280	970
People needing public shelter	0	2	9	36	120
People needing hospital care	0	1	3	11	34
Fatalities	0	0	0	1	4
Total economic loss ($ million)	1.5	18	72	250	690

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	1	16	79	400	1,500
People needing public shelter	0	2	9	37	130
People needing hospital care	0	1	3	12	37
Fatalities	0	0	0	1	5
Total economic loss ($ million)	2.1	20	79	270	760

Lovelock, Nevada

Epicenter at 1 18.39°W longitude, 40.18°N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Pershing County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	0	2	11	55	160
People needing public shelter	0	0	0	0	0
People needing hospital care	0	0	0	0	1
Fatalities	0	0	0	0	0
Total economic loss ($ million)	2.3	6.0	16	36	64

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	0	2	13	62	200
People needing public shelter	0	0	0	0	2
People needing hospital care	0	0	0	1	2
Fatalities	0	0	0	0	0
Total economic loss ($ million)	2.4	6.3	17	45	95

Mesquite, Nevada

Epicenter at 1 14.07° W longitude, 36.67° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Clark County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	3	17	120	560	1,100
People needing public shelter	0	1	12	60	120
People needing hospital care	0	0	4	32	79
Fatalities	0	0	1	8	21
Total economic loss ($ million)	4.2	14	54	200	410

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	3	17	120	300	1,100
People needing public shelter	0	1	12	30	120
People needing hospital care	0	0	4	14	79
Fatalities	0	0	1	3	21
Total economic loss ($ million)	4.2	14	54	120	410

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	3	18	130	590	1,200
People needing public shelter	0	1	4	61	130
People needing hospital care	0	0	4	32	82
Fatalities	0	0	1	8	22
Total economic loss ($ million)	4.3	16	59	220	480

Minden, Nevada

Epicenter at 1 19.73° W longitude, 38.97° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Douglas County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	10	46	230	690	1,300
People needing public shelter	0	3	14	42	69
People needing hospital care	1	2	15	46	81
Fatalities	0	0	3	12	21
Total economic loss ($ million)	25	66	170	370	550

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	13	69	380	1,700	5,300
People needing public shelter	1	5	27	120	360
People needing hospital care	1	3	19	82	280
Fatalities	0	1	4	20	73
Total economic loss ($ million)	32	100	300	850	2,100

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	14	75	410	1,800	5,600
People needing public shelter	1	6	31	130	400
People needing hospital care	1	3	19	86	300
Fatalities	0	1	4	21	76
Total economic loss ($ million)	36	110	340	980	2,400

Moapa, Nevada

Epicenter at 1 14.65° W longitude, 36.61° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Clark County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	2	21	120	480	1,400
People needing public shelter	0	2	9	39	160
People needing hospital care	0	1	4	16	54
Fatalities	0	0	0	3	9
Total economic loss ($ million)	8.4	30	94	290	840

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	2	21	120	480	1,400
People needing public shelter	0	2	9	39	160
People needing hospital care	0	1	4	16	54
Fatalities	0	0	0	3	9
Total economic loss ($ million)	8.4	30	94	290	850

Pahrump, Nevada

Epicenter at 1 15.92°W longitude, 36.22°N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Nye County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	11	55	390	1,300	2,400
People needing public shelter	0	0	3	10	19
People needing hospital care	0	0	2	11	27
Fatalities	0	0	0	2	5
Total economic loss ($ million)	4.9	15	43	110	190

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	11	58	410	1,400	2,700
People needing public shelter	0	1	8	28	67
People needing hospital care	0	1	4	17	42
Fatalities	0	0	1	3	7
Total economic loss ($ million)	5.3	23	84	240	540

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	11	58	410	1,400	2,700
People needing public shelter	0	1	8	28	67
People needing hospital care	0	1	4	17	42
Fatalities	0	0	1	3	7
Total economic loss ($ million)	5.3	23	84	240	550

Pioche, Nevada

Epicenter at 114.41° W longitude, 37.92° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Lincoln County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	2	9	56	170	380
People needing public shelter	0	0	1	4	11
People needing hospital care	0	0	0	2	8
Fatalities	0	0	0	1	2
Total economic loss ($ million)	1.8	5.5	19	51	120

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	2	9	56	170	390
People needing public shelter	0	0	1	4	13
People needing hospital care	0	0	0	2	9
Fatalities	0	0	0	1	2
Total economic loss ($ million)	1.8	5.6	19	52	140

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	2	9	57	170	410
People needing public shelter	0	0	1	4	14
People needing hospital care	0	0	1	2	9
Fatalities	0	0	0	1	2
Total economic loss ($ million)	1.8	5.6	20	57	150

APPENDIX M Earthquake Vulnerability by County & Statewide

Reno, Nevada

Epicenter at 1 19.80° W longitude, 39.52° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Washoe County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	130	540	2,800	6,900	11,000
People needing public shelter	32	120	460	990	1,400
People needing hospital care	8	30	160	480	840
Fatalities	1	6	39	130	220
Total economic loss ($ million)	310	770	1,900	3,600	5,200

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	130	550	2,800	7,100	12,000
People needing public shelter	32	120	460	1,000	1,500
People needing hospital care	8	30	160	480	890
Fatalities	1	6	39	130	240
Total economic loss ($ million)	310	780	1,900	3,700	5,700

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	130	550	2,800	7,100	12,000
People needing public shelter	32	120	460	1,000	1,500
People needing hospital care	8	30	160	480	890
Fatalities	1	6	39	130	240
Total economic loss ($ million)	310	780	1,900	3,800	5,900

Silver Springs, Nevada

Epicenter at 119.21° W longitude, 39.41° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Lyon County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	6	35	280	1,100	2,100
People needing public shelter	0	0	1	10	31
People needing hospital care	0	0	2	13	40
Fatalities	0	0	0	3	9
Total economic loss ($ million)	3.3	10	36	120	290

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	6	38	300	1,200	2,300
People needing public shelter	0	0	3	16	47
People needing hospital care	0	1	2	15	47
Fatalities	0	0	0	3	10
Total economic loss ($ million)	4.0	16	60	210	510

Sparks, Nevada

Epicenter at 1 19.76° W longitude, 39.53° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Washoe County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	119	520	2,700	6,700	10,000
People needing public shelter	26	100	410	910	1,300
People needing hospital care	8	29	160	480	820
Fatalities	1	6	39	130	220
Total economic loss ($ million)	283	720	1,800	3,500	5,000

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	120	520	2,700	6,900	12,000
People needing public shelter	26	100	410	920	1,400
People needing hospital care	8	29	160	480	880
Fatalities	1	6	39	130	230
Total economic loss ($ million)	290	730	1,800	3,600	5,500

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	120	520	2,700	6,900	12,000
People needing public shelter	26	100	410	920	1,400
People needing hospital care	8	29	160	480	880
Fatalities	1	6	39	130	230
Total economic loss ($ million)	290	730	1,800	3,600	5,600

Stateline, Nevada

Epicenter at 1 19.95°W longitude, 38.97°N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Douglas County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	8	37	160	420	700
People needing public shelter	0	3	12	31	48
People needing hospital care	0	0	2	8	19
Fatalities	0	0	0	2	4
Total economic loss ($ million)	16	42	100	230	340

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	9	47	210	750	2,300
People needing public shelter	1	4	18	61	180
People needing hospital care	0	1	4	22	100
Fatalities	0	0	1	5	25
Total economic loss ($ million)	19	61	180	510	1,300

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	40	180	890	2,600	5,500
People needing public shelter	5	21	99	250	480
People needing hospital care	1	4	28	110	260
Fatalities	0	1	7	27	69
Total economic loss ($ million)	79	210	590	1,400	2,800

Tonopah, Nevada

Epicenter at 1 17.19°W longitude, 38.08°N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Nye County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	2	14	78	180	290
People needing public shelter	0	0	1	4	6
People needing hospital care	0	0	1	2	5
Fatalities	0	0	0	1	1
Total economic loss ($ million)	1.9	5.6	17	39	76

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	3	14	80	200	400
People needing public shelter	0	0	1	4	6
People needing hospital care	0	0	1	2	5
Fatalities	0	0	0	1	1
Total economic loss ($ million)	2.0	5.9	18	44	100

Virginia City, Nevada

Epicenter at 1 19.63°W longitude, 39.34°N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Storey County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	3	17	110	230	320
People needing public shelter	0	0	1	4	6
People needing hospital care	0	0	1	4	7
Fatalities	0	0	0	1	2
Total economic loss ($ million)	7.4	16	33	62	83

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	20	110	740	3,000	7,600
People needing public shelter	1	9	46	230	670
People needing hospital care	1	4	21	120	430
Fatalities	0	1	4	29	110
Total economic loss ($ million)	39	140	480	1,500	3,300

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	20	110	740	3,000	7,700
People needing public shelter	1	9	46	240	680
People needing hospital care	1	4	21	120	430
Fatalities	0	1	4	29	110
Total economic loss ($ million)	39	140	490	1,500	3,400

Wells, Nevada

Epicenter at 1 15.00° W longitude, 41.12° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Elko County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	6	24	120	250	360
People needing public shelter	0	0	1	4	7
People needing hospital care	0	0	1	5	8
Fatalities	0	0	0	1	2
Total economic loss ($ million)	3.9	10	30	68	120

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	6	24	120	250	360
People needing public shelter	0	0	1	4	7
People needing hospital care	0	0	1	5	8
Fatalities	0	0	0	1	2
Total economic loss ($ million)	3.9	10	30	68	120

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	6	24	120	250	360
People needing public shelter	0	0	1	4	8
People needing hospital care	0	0	1	5	8
Fatalities	0	0	0	1	2
Total economic loss ($ million)	3.9	10	30	69	120

West Wendover, Nevada

Epicenter at 1 13.94° W longitude, 40.78° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Elko County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	2	11	75	260	450
People needing public shelter	0	0	4	15	27
People needing hospital care	0	0	3	14	35
Fatalities	0	0	1	3	10
Total economic loss ($ million)	1.4	4.7	17	47	86

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	2	11	75	260	450
People needing public shelter	0	0	4	15	27
People needing hospital care	0	0	3	14	35
Fatalities	0	0	1	3	10
Total economic loss ($ million)	1.4	4.7	17	47	87

Study Region: **Nevada and adjacent states**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	2	11	75	260	450
People needing public shelter	0	0	4	15	27
People needing hospital care	0	0	3	14	35
Fatalities	0	0	1	3	10
Total economic loss ($ million)	1.8	5.5	19	53	99

Winnemucca, Nevada

Epicenter at 1 17.74° W longitude, 41.00° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Humboldt County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	7	36	240	650	990
People needing public shelter	0	0	3	9	16
People needing hospital care	0	0	2	10	19
Fatalities	0	0	1	2	5
Total economic loss ($ million)	5.0	15	45	100	180

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	7	36	240	650	990
People needing public shelter	0	0	3	9	16
People needing hospital care	0	0	2	10	20
Fatalities	0	0	1	2	5
Total economic loss ($ million)	5.0	15	46	110	180

Yerington, Nevada

Epicenter at 1 19.20° W longitude, 38.97° N latitude depth = 10 kilometers

Results of earthquake scenarios using HAZUS, the Federal Emergency Management Agency's loss-estimation model. All numbers are estimates; individual numbers may vary by a factor of 10, depending on the location, depth, and magnitude of the earthquake.

Study Region: **Lyon County**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	1	6	45	270	1,300
People needing public shelter	0	0	0	4	16
People needing hospital care	0	0	0	3	20
Fatalities	0	0	0	1	5
Total economic loss ($ million)	9.3	19	42	98	220

Study Region: **All Nevada counties**	Earthquake Magnitude				
	5.0	**5.5**	**6.0**	**6.5**	**7.0**
Number of buildings with extensive to complete damage	1	7	53	300	1,400
People needing public shelter	0	0	1	7	27
People needing hospital care	0	0	1	6	24
Fatalities	0	0	0	1	5
Total economic loss ($ million)	9.5	22	56	140	360

APPENDIX O WSSPC Policies

The Western States Seismic Policy Council (WSSPC) is a regional earthquake consortium in the western states organized as a 501(c)(3) non-profit organization and funded by the Department of Homeland Security's Federal Emergency Management Agency and the U.S. Geological Survey. Members are the State Geological Survey and Emergency Management Directors of 13 western states, 3 U.S. territories, one Canadian territory, one Canadian province, and liaisons to 7 western state seismic safety councils and commissions. Its mission is to develop seismic policies and share information to promote programs intended to reduce earthquake-related losses.

The Nevada Earthquake Safety Council (NESC) is Nevada's liaison with the Western States Seismic Policy Council. Members of NESC work to implement the Nevada Educational Seismic Network and work on mitigation of fault-related hazards.

One major agenda item planned for the Nov. 13, 2013 NESC meeting is to endorse the most recently revised Western States Seismic Policy Council's recommendations adopted at its annual meeting held in Seattle, WA.

The most up-to-date version of those WSSPC policies is available at the link listed below.

http://www.wsspc.org/policy/recommendations.shtml

Earthquake:

- Clark County Microzonation project – link: http://crack.seismo.unr.edu/ftp/pub/louie/parcel/Clark_report_final.pdf

- Multihazard project completion reports - link: http://dem.nv.gov/DEM/Division_News/

- The Great Nevada ShakeOut; The main goal of the ShakeOut is to get Nevadans prepared for major earthquakes - an opportunity to learn what to do before, during, and after an earthquake. Participants are urged to visit http://www.earthquakecountry.info/roots/seven_steps.html for tips on how to prepare, protect, and recover from a damaging earthquake. http://shakeout.org/nevada/

- Preliminary Assessment of Potentially Unreinforced Masonry Buildings in Nevada, 2012, by Jonathan G. Price, Gary Johnson, Craig M. dePolo, Wayne Carlson, NBMG Report 54.

This report is a preliminary assessment of potentially unreinforced masonry buildings (URMs) in Nevada. These are the buildings that are highly susceptible to collapse or partial collapse during earthquakes and are therefore of concern for life safety and economic recovery. Data are compiled from information provided by county assessors' offices and the Public Works Division of the State of Nevada with assumptions that potential URMs are those brick, stone, or cement-block masonry buildings that were constructed before 1974. There are tens of thousands of potential URMs in Nevada. They are located in every county and nearly every community. Many URMs are historically significant, and many are concentrated in downtown business districts and along thoroughfares. It is important to note that not all Nevada URMs have been identified in this study, and some structures identified as potential URMs may not be. Risks from URMs can be reduced by removing the buildings, seismic rehabilitating them, and minimizing human occupancy.

The report is available as an online document free on the web at the following online link: http://www.nbmg.unr.edu/dox/r54.pdf

FLOOD

*(*Note: since the submission of this report, the definition of Repetitive Loss and Severe Repetitive Loss Properties has changed)*

CARSON WATER SUBCONSERVANCY DISTRICT
ACTIVITIES AND ACCOMPLISHMENTS
FOR 2012

1. Continued to coordinate the Carson River Coalition (CRC) which met several times during 2012, as well as various working groups which met regularly addressing community outreach and education, river corridor, noxious weeds, aquatic invasive species, and water quality issues.

2. Grants applied for and awarded in 2012 (and provided project management for):
   - Floodplain Modeling and Mapping for the Carson River (Douglas County reach) $375,000 FEMA funds

3. Continued to administer grant funds and provide project management for:
   - Fire fuels reduction and weed abatement projects ($628,000) from the American Recovery and Reinvestment Act of 2009 (ARRA) as a result of the partnerships of the CRC. In 2012, CWSD distributed $74,520 to various weed management and conservation districts throughout the entire watershed.
   - "Explore Your Watershed" Conservation Tours grant.
   - Environmental Education Program
   - Carson River Coalition (CRC) Coordinator
   - Floodplain modeling and mapping for the Carson River in the Dayton and Carson City areas - FEMA MAS 1 and 2
   - Comprehensive Regional Water Management Plan
   - Clear Creek Watershed Council Program
   - Light Detection and Ranging (LiDAR) data collection for Carson Valley
   - Best Management Practices (BMP) investigating the feasibility of a small residential BMP program

4. Provided funding for:
   - Carson River Workdays - "Conserve Carson River Workdays"
   - Alpine Watershed Group Projects
   - Carson Valley Stream Bank Restoration Project.
   - Streambank repairs located below Lloyd's Bridge.
   - Douglas County Regional Pipeline Debt Service
   - Carson City Regional Pipeline Debt Service
   - Carson City's Waterfall Fire Watershed Improvements #4

- Lyon County Ramsey Canyon Flood Control Study
- River Restoration and Floodplain Conservation Projects in Dayton Valley
- Churchill County Drainage Study
- Churchill County streambank restoration and channel clearance projects
- Watershed-Wide Water Conservation Program
- Noxious weed treatment throughout the watershed
- Invasive Species Program including aquatic invasives education/outreach.

5. Provided funding for the following USGS projects: :
   - Eleven Streamflow Gages - ongoing maintenance
   - Douglas County Water Level Collection
   - Dayton Valley Groundwater Level and Nitrate Study
   - East Fork Algae Study
   - Churchill County Groundwater Level and Water Quality Study.

6. The General Manager and Watershed Coordinator gave presentations and provided display booths at various conferences and workshops on watershed issues.

7. The General Manager gave an update to each of the county and water purveyor boards on the regional water system and watershed-wide programs and projects.

8. Developed quarterly newsletters that were sent out to about 1,000 individuals watershed-wide.

9. Provided facilitation for several workdays and school outreach events.

10. Provided support for Alpine and Clear Creek Watershed Coordinators. A new Clear Creek Watershed coordination was hired.

11. Continued FEMA Mapping Assessment Study (MAS) Phase 2 of modeling/mapping to the Carson City/Douglas County line – FEMA funds.

12. Assisted in the coordination of the Riparian Areas Video Contest in conjunction with the CRC Education Working Group and the NEMO Program.

13. Helped organize and participated in the 8th Annual Snapshot Day on the Carson River.

14. Assisted Carson City and Douglas County with National Flood Insurance Program (NFIP) Community Rating System Reports.

15. Provided report on regional outreach activities to Douglas County for their annual stormwater reporting.

16. Maintained the Watershed Learning Center at the Children's Museum in conjunction with the CRC Education Working Group.

17. Continued to work with NDEP and USGS for field work associated with the East Fork Algae Study.

18. Developed floodplain and flood community awareness display for Carson City public library which may be used at other watershed libraries and government offices.

19 Developed noxious weed identification page for CWSD website

20. Organized and facilitated the 2012 Watershed Forum discussing floodplain management issues, sustainable agriculture, open space protection, noxious weed management, water quality, and water quantity issues.

21. Continued gathering data and working with stakeholders for update of Adaptive Stewardship Plan.

22. Developed the Interim Regional Water Conservation Plan.

23. Updated the Water Rate Study for all the water purveyors in the Carson River Watershed.

24. Assisted Alpine County with its Groundwater Level Monitoring Program.

25. Conducted the annual "Get on the Bus " Watershed Tour of Alpine through Churchill Counties.

26. LiDAR data was collected for the Carson Valley area in late September.

CARSON WATER SUBCONSERVANCY DISTRICT
ACTIVITIES AND ACCOMPLISHMENTS
FOR 2011

1. Continued to coordinate the Carson River Coalition (CRC) which met several times during 2011, as well as various working groups which met monthly addressing community outreach and education, river corridor, noxious weeds, aquatic invasive species, and water quality issues.

2. Grants applied for and awarded in 2011 (and provided project management for):
    - Carson River Coalition Coordinator - $105,113 (3 years) NDEP 319 funds

- Environmental Education Coordinator - $97,774 (2 years) NDEP 319 funds
- Carson River Conservation Tours $23,653 (1.5 years) NDEP 319 funds
- East Fork Algae Study $43,300 (2 years) NDEP 208 funds
- Floodplain Modeling and Mapping for the Carson River (Carson City reach) $300,000 (for 2011/12) FEMA funds

3. Continued to administer grant funds and provide project management for:
    - Fire fuels reduction and weed abatement projects ($628,000) from the American Recovery and Reinvestment Act of 2009 (ARRA) as a result of the partnerships of the CRC. In 2011, CWSD distributed $58,770 to various weed management and conservation districts throughout the entire watershed.
    - Environmental Education Program
    - Carson River Coalition (CRC) Coordinator
    - Floodplain modeling and mapping for the Carson River in the Dayton area
    - Development of the Hydraulic Modeling and Floodplain Mapping Guidelines for the Carson River upstream of Lahontan Reservoir
    - Carson City's pilot Residential Best Management Practices (BMP) Program
    - Comprehensive Regional Water Management Plan
    - Middle Carson River Habitat Conservation Plan
    - Clear Creek Watershed Council Program
4. Provided funding for:
    - Carson River Workdays - "Conserve Carson River Workdays"
    - Alpine Watershed Group Projects
    - Carson Valley Stream Bank Restoration Project.
    - Douglas County Land Conservation Program
    - Douglas County Regional Pipeline Debt Service
    - Infiltration Characteristics in the Pine Nut Alluvial Fans Study
    - Carson City Regional Pipeline Debt Service
    - Carson City Wetland Enhancement Project (Fulstone)
    - Vehicle Removal Out of the Carson River Canyon.
    - Mosquito Abatement Along the Carson River in Carson City
    - Lyon County Regional Water Monitoring and Disinfection Project
    - Lyon County Ramsey Canyon Flood Control Study
    - Rolling A River Restoration and Floodplain Conservation Project in Dayton Valley
    - Churchill County Drainage Study
    - Watershed-Wide Water Conservation Program
    - State Engineer Groundwater Pumping Inventory
    - Noxious weed treatment throughout the watershed

5. Provided funding for the following USGS projects: :
    - Eleven Streamflow Gages - ongoing maintenance
    - Douglas County Water Level Collection
    - Carson Valley Groundwater Model
    - Dayton Valley Groundwater Level and Nitrate Study
    - Carson Valley Groundwater Nitrate Study
    - Middle Carson Groundwater Model

6. The General Manager and Watershed Program Manager gave presentations and provided display booths at various conferences and workshops on watershed issues.

7. The General Manager gave an update to each of the county and water purveyor boards on the regional water system and watershed-wide programs and projects.

8. Developed quarterly newsletters that were sent out to 550 individuals watershed-wide.

9. Provided facilitation for several workdays and school outreach events.

10. Provided support for Alpine and Clear Creek Watershed Coordinators. The CWSD Watershed Coordinator took over Clear Creek Watershed coordination function upon retirement of former coordinator.

11. Upon Genie Azad's retirement from the Watershed Program Manager position, revamped position goals and duties and hired Brenda Hunt as CWSD Watershed Coordinator.

12. Staff conducted residential irrigation surveys to help homeowners evaluate their irrigation systems for possible water conservation measures.

13. Continued to provide project management for Carson Clear Water Revival Program. Second demonstration project was completed.

14. Worked with CRC River Corridor Working Group and consultants to investigate the value of floodplain ecosystem services.

15. Completed the Dayton Valley Floodplain Physical Map Revision and began Phase 2 of modeling/mapping to the Carson City/Douglas County line – FEMA funds.

16. Assisted in the coordination of the Riparian Areas Video Contest in conjunction with the CRC Education Working Group and the NEMO Program.

17. Helped organize and participated in the Sixth Annual Snapshot Day on the Carson River.

18. Assisted Carson City and Douglas County with National Flood Insurance Program (NFIP) Community Rating System Reports.

19. Provided report on regional outreach activities to Douglas County for their annual stormwater reporting.

20. Maintained the Watershed Learning Center at the Children's Museum in conjunction with the CRC Education Working Group.

21. Continued to work with NDEP and USGS for field work associated with the East Fork Algae Study.

22. Developed floodplain and flood community awareness display for Carson City public library which may be used at other watershed libraries and government offices.

23. Developed noxious weed identification page for CWSD website

24. Organized and facilitated the 2011 Watershed Forum discussing flooding issues, sustainable agriculture, organic farming, and noxious weed management.

25. Continued to facilitate the Hydrology and Hydraulics Flood Committee.

26. Continued gathering data and working with stakeholders for update of Adaptive Stewardship Plan.

27. Developed the Interim Regional Water Conservation Plan.

28. Updated the Water Rate Study for all the water purveyors in the Carson River Watershed.

29. Assisted Alpine County with its Groundwater Level Monitoring Program.

CARSON WATER SUBCONSERVANCY DISTRICT
ACTIVITIES AND ACCOMPLISHMENTS
FOR 2010

1.Continued to coordinate the Carson River Coalition (CRC) which met quarterly throughout 2010, as well as various working groups which met monthly addressing community outreach and education, river corridor, noxious weeds, aquatic invasive species, and water quality issues.

2.Grants applied for and awarded in 2010 (and provide project management for):

- Carson River Coalition Coordinator - $54,270 (2 years) NDEP 319 funds
- Environmental Education Coordinator - $42,080 (2 years) NDEP 319 funds
- Middle Carson River Habitat Conservation Plan - $150,000 (2 years) Q1 funds
- Carson River Conservation Tours $19,874 (1.5 years) NDEP 319 funds
- East Fork Algae Study $43,221 (2 years) NDEP 208 funds
- Comprehensive Regional Water Management Plan $50,000 (2 years) BOR funds
- Clear Creek Watershed Council Coordinator $45,958 (3 years) – has not been awarded yet.
- Floodplain Modeling and Mapping $300,000 (for 2011) FEMA

3.Continued to administer grant funds and provide project management for:

- Fire fuels reduction and weed abatement projects ($628,000) from the American Recovery and Reinvestment Act of 2009 (ARRA) as a result of the partnerships of the CRC. In 2010, CWSD distributed $269,000 to various weed management and conservation districts throughout the entire watershed.
- Environmental Education Program
- Carson River Coalition (CRC) Coordinator
- Floodplain modeling and mapping $300,000 FEMA
- Floodplain modeling assistance $50,000 (2 year) NDEP 319
- Carson City pilot Residential Best Management Practices (BMP) Program called “Carson Clear Water Revival” $28,000 (1 year)
- Comprehensive Regional Water Management $50,000 (1 year) BOR

4. Provided funding for:

- Rolling A River Restoration and Floodplain Conservation Project in Dayton Valley
- Carson River Workdays
- Carson Valley Golf Course River Restoration Project.
- Carson City Fuji Park Fish Pond BMP and Water Quality Monitoring Program
- Douglas County Land Conservation Program
- Churchill County Drainage Study
- Watershed-Wide Water Conservation Program
- Alpine Watershed Group’s Watershed Coordinator
- State Engineer Groundwater Pumping Inventory

5. Provided funding for the following USGS projects: :

- Eleven Streamflow Gages - ongoing maintenance

- Douglas County Water Level Collection
- Carson Valley Groundwater Model
- Dayton Valley Groundwater Level and Nitrate Study
- Carson Valley Nitrate Study
- Middle Carson Groundwater Model

6. The General Manager and Watershed Program Manager gave presentations at various conferences and workshops on watershed issues.

7. The General Manager and Watershed Program Manager gave an update to each of the county and water purveyor boards on the regional water system and watershed-wide programs and projects.

8. Developed quarterly newsletters that were sent out to 550 individuals watershed-wide.

9. Provided facilitation for several workdays and school outreach events.

10. Provided support for Alpine and Clear Creek Watershed Coordinators.

11. The Senior Clerk became a Certified Water Use Efficiency Practitioner through the "American Water Works Association" Program.

12. Staff conducted residential irrigation surveys to help homeowners evaluate their irrigation systems for possible water conservation measures.

13. Continued to provide project management for Carson Clear Water Revival Program. First demonstration project was completed.

14. Worked with CRC River Corridor Working Group and consultants to investigate the value of floodplain ecosystem services.

15. Completed validation of the 2004 LiDAR dataset to ensure that the data met FEMA's requirements for use in floodplain mapping.

16. Hired HDR Engineering for Dayton Valley Floodplain Physical Map Revision (modeling and re-mapping) – FEMA funds.

17. Coordinated the Riparian Areas Video Contest in conjunction with the CRC Education Working Group and the NEMO Program.

18. Helped organize and participated in the Fifth Annual Snapshot Day on the Carson River.

19. Assisted Carson City and Douglas County with National Flood Insurance Program (NFIP) Community Rating System Reports.

20. Provided report on regional outreach activities to Douglas County for their annual stormwater reporting.

21. Maintained the Watershed Learning Center at the Children's Museum in conjunction with the CRC Education Working Group.

22. Worked with NDEP and USGS for field work associated with the East Fork Algae Study.

23. Began development of floodplain and flood community awareness campaigns. Posted 100 flood awareness posters throughout watershed and distributed flyers regarding being flood prepared to all fifth grade classes.
24. Developed flood safety page for CWSD website
25. Organized and facilitated the 2010 Annual Noxious Weed Management Forum
26. Organized and facilitated Hydrology and Hydraulics Flood Committee
27. Continued gathering data and working with stakeholders for update of Adaptive Stewardship Plan
28. Continued implementation of Regional Floodplain Management Plan

- For more information, please see the Carson Water Subconservancy District's website at: http://www.cwsd.org/newcms/Userpages/index.aspx
  Projects page: http://www.cwsd.org/newcms/userpages/Project.aspx

Truckee River Flood Management Authority Accomplishments as of April 2013

- Acquired Twelve properties (126 acres) located in the FEMA Flood Zone & Flood Way
- Relocated over 40 tenants from flood project owned properties
- *Completed demolition on six repetitive loss structures
- *Worked with the City of Reno on the Virginia Street Bridge public visioning workshops, bridge type selection and design.
- SB 175 was signed by Governor Gibbons on June 8, 2009. SB 175 amends existing law to make sure we can build and operate the Truckee River Flood Management Project in the way our community has envisioned it.

- *AB 54 was signed by the Governor May 29, 2009. The bill authorizes the County to establish financing programs to assist individual homeowners and businesses with flood proofing and elevation of homes, and with water and wastewater hookups
- Received $4.75 M in funding from the 2009 Nevada Legislature for restoration projects
- Produced an annual Flood Awareness Campaign to reach out to the community regarding flood safety, awareness and preparedness
- Transferred the Flood Warning System from Washoe County Water Resources Dept. to the Flood Project
- Formed the Truckee River Flood Management Authority in 2012 through a Joint Powers Authority with Reno, Sparks and Washoe County
- Completed the first Ecosystem Restoration TRAction Project at Lockwood
- Completed construction of the Reno-Sparks Indian Colony Levee/Floodwall ($5.8M). Won two awards for project – American Public Works Association – Project of the Year for the Environment for the State of Nevada and the American Society of Civil Engineers Project of the Year for the Environment for Northern Nevada
- Completed construction of the 102 Ranch Ecosystem Restoration TRAction project
- Completed construction of the Lower Mustang Ranch Ecosystem Restoration TRAction project
- Tracy Power Plant Ecosystem Restoration Project set to begin construction in August 2013
- Completed Phase I of the Regional Hydrologic Model – Sun Valley Pilot Project.
- Currently in Phase II of the Regional Hydrologic Community model
- Assisted City of Reno and Washoe County with the adoption of the community-wide Flood Hazard Mitigation Ordinance

For more projects of Truckee River Flood Management Authority: see website at this link: http://truckeeflood.us/

REGIONAL FLOOD CONTROL DISTRICT

Projects Completed 2010 to 2013

44 projects completed totaling approximately $225.3 million

Construction Costs include construction and construction management

Clark County

Annie Oakley Drive at Rawhide Channel Storm Drain
This project consists of local drainage improvements with the channelizing of the dirt shoulder along the south side of Rawhide Street. This project will convey flows entering the southeast corner of the intersection into an existing 36 inch reinforced concrete pipe to a proposed field inlet on the southeast corner of Annie Oakley Drive and Rawhide Street.
Construction Cost: $58,000
Estimated Completion Date: February 2013

Blue Diamond Wash Wigwam, UPRR to Rainbow Blvd
Construction of approximately 1.3 miles of concrete box culvert within Wigwam Avenue between Rainbow Boulevard and the Union Pacific Railroad, east of Jones Boulevard.
Construction Cost: $5.6 million
Completion Date: January 2011

Duck Creek, Mountain Vista Street to Green Valley Parkway
The improvements to this segment of Duck Creek included 3,900 feet of 60 foot wide rectangular concrete channel with flows ranging from 6,074 cfs to 6,195 cfs.
Construction Cost: $8.4 million (RFCD share)
Completion Date: February 2012

Duck Creek, Railroad Detention Basin
This project includes an 868 acre-foot detention basin located just north of Cactus Avenue between Rainbow Boulevard and the Union Pacific Railroad along with approximately 4,000 feet of concrete collector channel.
Construction Cost: $13.5 million (RFCD Share)
Completion Date: February 2011

Duck Creek, Robindale to I-215
(CLA14W11) DCWA 0967
Improvements included construction of approximately 650 feet of concrete channel bottom, and removal and replacement of failing concrete channel slope paving.
Construction Cost: $846,000
Completion Date: February 2012

Flamingo Diversion – South Buffalo Branch, Flamingo Wash to Sunset Rd

This project consists of 1.6 miles of reinforced concrete box and pipe in Buffalo Road from Sunset Road to the existing Flamingo Diversion Channel.
Construction Cost: $7.6 million
Completion Date: March 2013

Flamingo Wash, Desert Inn to Eastern Avenue
Project includes channel improvements for the Flamingo Wash between Eastern Avenue and Desert Inn Road. The improvements will stabilize the banks of 4,900 feet of the wash. A segment of the Flamingo Arroyo Trail will be constructed with the project. The trail enhancements will be funded with money from the Southern Nevada Public Lands Management Act (SNPLMA).
Construction Cost: $7 million (RFCD Share)
Completion Date: December 2010

Flamingo Wash, Nellis Blvd to I-515
These improvements included 1.2 miles of rectangular concrete lined channel along the Flamingo Wash between Nellis Blvd and I-515.
Construction Cost: $11.2 million
Completion Date: February 2012

Las Vegas Boulevard / Serene Avenue Storm Drain
Construction of a concrete pipe storm drain within Serene Avenue between I-15 and Las Vegas Boulevard.
Construction Cost: $164,000 (RFCD Share)
Completion Date: June 2011

Lower Blue Diamond Detention Basin
Construction includes a 461 acre-foot detention basin and associated drainage facilities near Windmill Lane and the Union Pacific Railroad. Also included in the project is the Robindale inflow structure and collection facilities.
Construction Cost: $2.8 million
Completion Date: January 2011

Lower Flamingo Detention Basin
This project included a 222 acre-foot detention basin located at the intersection of Tropicana and Decatur. Stormwater flow rate into the basin is 3,101 cfs and flow out is 909 cfs, a reduction of 71 percent. The basin will also include multiuse park facilities funded by the Southern Nevada Public Lands Management Act for an additional $10.8 million.
Construction Cost: $3.4 million (RFCD share)
Completion Date: July 2012

Olive Street Storm Drain, US-95 to Palm St.
This project consists of local drainage improvements and approximately 2,540 feet of reinforced concrete box and pipe in Olive Street between US 95 and Palm Street. This storm drain will connect to the existing Colorado Avenue System storm drain.
Construction Cost: $818,000 (RFCD share)
Completion Date: February 2013

Sunrise Ave Storm Drain, Fogg St to Clayton St (local drainage)
This is a local drainage project to minimize flooding of Sunrise Avenue between Clayton Street and Lailani Street. It includes one drop inlet and 1940 ft of 24 inch reinforced concrete pipe.
Construction Cost: $177, 000 (RFCD Share)
Completion Date: July 2011

Tropicana North Branch Detention Basin
Construction of a 54 acre-foot detention basin just north of Hacienda Avenue between Arville Street and the Union Pacific Railroad. Approximately 700 feet of concrete collector channel is also included in the project.
Construction Cost: $1 million (RFCD Share)
Completion Date: July 2011

Tunis Ave and Karvel St Storm Drain (local drainage)
This local drainage project will alleviate flooding in the intersection of Karvel Street and Tunis Avenue. The project consists of a concrete open channel and earthen channel which will connect with Duck Creek Channel.
Construction Cost: $182,400
Completion Date: June 2011

Twain at Pecos – McLeod Storm Drain
Local drainage improvements include a new storm drain system to connect to the existing 48 inch storm drain at Twain Avenue and head south along the original Mojave Road alignment then turning east on Twain Avenue to the Van Buskirk Channel on Pecos Road.
Construction Cost: $555,000 (RFCD Share)
Completion Date: October 2010

City of Las Vegas

Alta Parallel
Construction includes 3,600 feet of 6 foot by 4 foot to 7 foot by 6 foot box culvert and concrete channel, a 31 acre foot detention basin expansion as well as 1,400 feet of reinforced concrete pipe within Lorenzi between Alta and US-95.
Construction Cost: $8.6 million
Completion Date: July 2010

Elkhorn Springs & Buffalo Storm Drain
This project includes the construction of a concrete pipe within Buffalo Drive from Farm Road south to the Elkhorn Springs Detention Basin.
Construction Cost: $1.4 million
Completion Date: May 2011

Gilmore Ave – Decatur Blvd to Thom Blvd Storm Drain (local drainage)
This local drainage project consists of a 36-inch reinforced concrete pipe storm drain that will help reduce flooding in the neighborhood between Decatur Boulevard and Thom Boulevard along Gilmore Avenue.
Construction Cost: $409,600 (RFCD Share)
Completion Date: May 2011

Gowan Outfall – Lone Mountain Branch (Rancho Dr to Decatur Blvd.)
This project consisted of almost two miles of reinforced concrete boxes ranging in size from 6 feet by 6 feet to 14 feet by 7 feet in Lone Mountain Road.
Construction Cost: $10 million (RFCD Share)
Completion Date: June 2012

Grand Teton Overpass
Construction includes 2,400 feet of 10 foot by 5 foot box culvert over Grand Teton.
Construction Cost: $1.9 million

Completion Date: April 2010

Horse Drive Interchange
Construction of approximately a mile of channel and storm drain facilities along the west side of US-95 north of Grand Teton Drive. This project is being constructed in conjunction with Nevada Department of Transportation's Horse Drive Interchange project.
Construction Cost: $5 million (RFCD Share)
Completion Date: December 2010

Langtry Channel – Bonanza Rd to Washington Ave
The improvements consisted of lining 1,360 feet of existing walls and lining and/or replacing the existing invert slab with an 8-inch thick reinforced concrete lining along with an 18-inch reinforced concrete pipe beneath the new channel slab.
Construction Cost: $1.2 million
Completion Date: November 2011

Las Vegas Wash – Decatur & Elkhorn, CC 215
This project included construction of nearly three miles of concrete box culvert in the northwest part of the Valley. The facility conveys flows from another facility at Elkhorn Road and Torrey Pines Drive east to Decatur Boulevard, then south to Centennial Parkway where the system connects into a facility at the Beltway.
Construction Cost: $26.8 million (RFCD Share)
Completion Date: June 2012

Las Vegas Wash – Rainbow (Elkhorn Rd to Grand Teton Dr)
Construction includes 5,100 feet of 24 foot by 8 foot box culvert and concrete channel within Rainbow Boulevard between Elkhorn Road and Grand Teton Drive.
Construction Cost: $7.9 million
Completion Date: March 2011

North and South Environmental Enhancement Areas – Floyd Lamb Park
This project included a 165 acre detention basin, a 50 acre detention basin and 1 mile of concrete pipe near Floyd Lamb Park. The enhancement areas are part of the Floyd Lamb Park Master Plan. Together the basins and park improvements include nearly 200 acres of passive recreational improvements, picnic areas and hiking trails.
Construction Cost: $23.3 million (RFCD Share)
Completion Date: April 2012

Oakey Drain – Cahlan to Barnard
This project includes approximately 3,350 feet of reinforced concrete box and pipes, with associated lateral facilities, in Oakey Street extending from Cahlan Drive to Barnard Drive.
Construction Cost: $5.5 million (RFCD share)
Completion Date: January 2013

Oakey – Meadows Storm Drain, Phase I
Construction of approximately 5,500 feet of concrete channel and box culvert extending along Valley View Boulevard from Charleston Boulevard to the Meadows Detention Basin.
Construction Cost: $12.1 million
Completion Date: January 2011

Oakey Meadows Storm Drain – Phase 2A
This project included construction of 3,900 feet of underground storm drain in Charleston from Hinson Street west to Decatur Blvd.
Construction Cost: $7.5 million
Completion Date: April 2012

Oakey Meadows Storm Drain – Phase 2B
This project includes construction of 2,000 ft of underground storm drain within Hinson Street from Charleston Blvd. to Del Rey Ave..
Construction Cost: $1.8 million (RFCD Share)
Completion Date: March 2013

City of North Las Vegas

Las Vegas Wash – Las Vegas Boulevard to Cheyenne Avenue
The project involves construction of flood control facilities along the Las Vegas Wash between Las Vegas Boulevard and Cheyenne Ave, connecting to existing improvements at both locations. Facilities are designed to convey up to 8,065 cfs in a 100-year storm event. Rectangular channel sizes range from 70 feet wide by 8 feet deep to 90 feet wide by 9.5 feet deep.
Construction Cost: $6.9 million (RFCD share)
Completion Date: April 2013

Simmons Street Drainage Improvements – Gowan Outfall
This project includes construction of confluence and transition structures and a bridge over Gowan Outfall Channel at Simmons Street near Red Coach Avenue.
Construction Cost: $2.6 million (RFCD Share)
Completion Date: June 2011

Tropical Parkway Channel East
This project includes construction of approximately one mile of box culvert within Tropical Parkway from North 5th Street to the Upper Las Vegas Wash.
Construction Cost: $6.9 million (RFCD Share)
Completion Date: May 2011

City of Henderson

C-1 Equestrian Tributary
The project includes 2,300 feet of concrete channel and an energy dissipater structure at the corner of Magic Way and Equestrian Drive. The project will reduce flows in the existing C-1 Channel by collecting and diverting flows into the existing Equestrian Detention Basin.
Construction Cost: $2 million
Completion Date: July 2010

Equestrian Tributary – Phase I
The project includes 2,300 feet of concrete channel that begins at the Equestrian Detention Basin and runs parallel to Equestrian Drive.
Construction Cost: $1.9 million
Completion Date: March 2010

MacDonald Ranch Channel
The project includes 2,400 feet of concrete channel between Arroyo Grande Boulevard and the 215.
Construction Cost: $1.9 million
Completion Date: April 2010

Northeast C-1 Detention Basin and Outfall
The project includes 350 acre-foot detention basin near Magic Way with 1.5 miles of concrete channel and 1.2 miles of outfall pipe.
Construction Cost: $12.9 million

Completion Date: March 2010

NV Energy Relocation Equestrian Tributary Phase I
This project includes the relocation of NV Energy lines and installation of reinforced concrete box (RCB) through the intersection of Equestrian Drive and Appaloosa Road.
Construction Cost: $259,000
Completion Date: October 2012

Pittman Railroad East Conveyance
This project consists of a concrete box culvert located east of Arroyo Grande Boulevard between Union Pacific Railroad spur tracks and the Pittman Wash near I-215 and Stephanie Street. City of Henderson Parks and Recreation will build underground crossings below American Pacific Drive and the railroad and pave the access road for a trail.
Construction Cost: $8.5 million (RFCD Share)
Completion Date: December 2010

Pittman Wash, UPRR to Santiago Phase I
The project includes modification to the spillway for Pitman Park Peaking Basin and reconstruction of the outfall pipe.
Construction Cost: $260,000 (RFCD Share)
Completion Date: August 2012

City of Mesquite

Town Wash Conveyance, I-15 to Virgin River
Project included construction of approximately 1.1 miles of concrete channel along the Town Wash alignment from I-15 to the Virgin River.
Construction Costs: $2.4 million (RFCD Share)
Completion Date: July 2011

City of Boulder City

Bootleg Canyon Detention Basin
This project included construction of a detention basin structure with 24-inch outfall pipe.
Construction Cost: $383,100
Completion Date: February 2012
Yucca Debris Basin, Collection and Outfall
This project included construction of a 1,250 feet trapezoidal concrete channel and a sediment basin.
Construction Cost: $1.7 million
Completion Date: February 2012

For more projects of the Clark County Regional Flood Control District see website at the following link:

http://www.ccrfcd.org/

Wildfire:

- Report to Nevada State Legislature-AB75; Fire-Fuels-Forest Restoration Activities and Accomplishment at Lake Tahoe – link: http://forestry.nv.gov/wp-content/uploads/2012/04/AB_75_report_2011.pdf

- Community Wildfire Protection Plan (CWPP) on-line: http://www.livingwithfire.info/cwpp

- Nevada's Annual Wildland-Urban Interface (WUI) Fire Summit Meeting – link to website: http://www.iafc.org/wui

Summary of Round 12 Round 12 KyleCyn-LeeCyn Funding Requests and Rationale (end 2012)

Kyle Canyon and Lee Canyon:

Previous Funding:	SNPLMA Round 8 and SNPLMA Round 10
Progress:	Round 8 & 10 Funding: 84 properties treated and 90 tons of chipped materials sent to Moapa Paiute Indian Reservation for use as soil amendment. Many of the treated properties tie into the USDA USFS shaded fuel break. Two major curbside events, 16 educational and outreach events, participation by community members in the 2009 and 2010 Wildland Urban Interface (WUI) Summit. Events held during the 2009 and 2010 Nevada Wildfire Awareness Week. Three door to door outreach campaigns.
Round 12 Request:	$275,000
Deliverables:	**T**reatment of 65 residential lots. Plan and execute one major curbside/outreach event, community participation in the 2011WUI Summit event, and participation in a Nevada Wildfire Awareness Week event. Two door to door outreach campaigns.
Match:	$90,000 in-kind match
Biomass Utilization:	Biomass generated will be sent to a recycling center for processing to be used as the carbon component in soil amendments. Biomass will also be used on site for erosion and weed control.

Cold Creek:

Previous Funding:	SNPLMA Round 8 and SNPLMA Round 10
Progress:	SNPLMA Round 8 &10 Funding: 10 properties treated to date, one curbside event, four educational/outreach events, participation by community members in the 2009 and 2010 Nevada's WUI Summit. Events held during the 2009, 2010 Wildfire Awareness Week.
Round 12 Request:	$50,000
Deliverables:	Treatment of 12 properties (1-and 2-acre lots). Plan and execute one major curbside/outreach event, community participation in the 2011 WUI Summit and participation in a Nevada Wildfire Awareness Week event.
Match:	$16,000 in-kind match
Biomass Utilization:	Biomass generated will be sent to a recycling center for processing to be used as the carbon component in soil amendments. Biomass will also be used on site for erosion and weed control.

Mtn Springs continuation

Previous Funding:	SNPLMA Round 8 and SNPLMA Round 10
Progress:	SNPLMA Round 8 & 10 Funding: Four acres treated, one curbside event, four educational/outreach events, participation by community members in the 2009 and 2010 Nevada's WUI Summit. Events held during the 2009, 2010 Wildfire Awareness Week.
Round 12 Request :	$50,000
Deliverables:	12 properties (1-and 2-acre lots) Plan and execute one major curbside/outreach event, community participation in the 2011 WUI Summit and participation in a Nevada Wildfire Awareness Week event.
Match:	$12,000 in-kind match
Biomass Utilization:	Biomass generated will be sent to a recycling center for processing to be used as the carbon component in soil amendments. Biomass will also be used on site for erosion and weed control.

Trout Canyon Continuation:

Previous Funding:	SNPLMA Round 8 and SNPLMA Round 10
Progress:	SNPLMA Round 8 & 10 Funding: Eight acres of steep slope private property treated to tie into USFS shaded fuel break utilizing USFS prescription. Community member participation in the 2009 WUI Summit.

Round 12 Request $50,000
Deliverables: Eight properties (1/2-to 2 acres each), community member participation in the 2011 WUI Summit.
Match: $16,000 in-kind match
Biomass Utilization: Biomass generated will be sent to a recycling center for processing to be used as the carbon component in soil amendments. Biomass will also be used on site for erosion and weed control.

Project Management and Oversight:
Management: $65,000 is requested for one FTE to oversee implementation of Round 12 funds. This includes travel and benefits.
Administration: $10,000 is requested for administrative support. This includes accounting, bookkeeping, office space, and supplies.

Spring MountainsAccomplishment Report

December 27, 2011

Grant # L11AC20348-0001-6900 (Spring Mountain SNPLMA Round 10)

This grant was funded at 81% of the original request. The deliverables as stated in the Assistance Agreement have been adjusted accordingly.

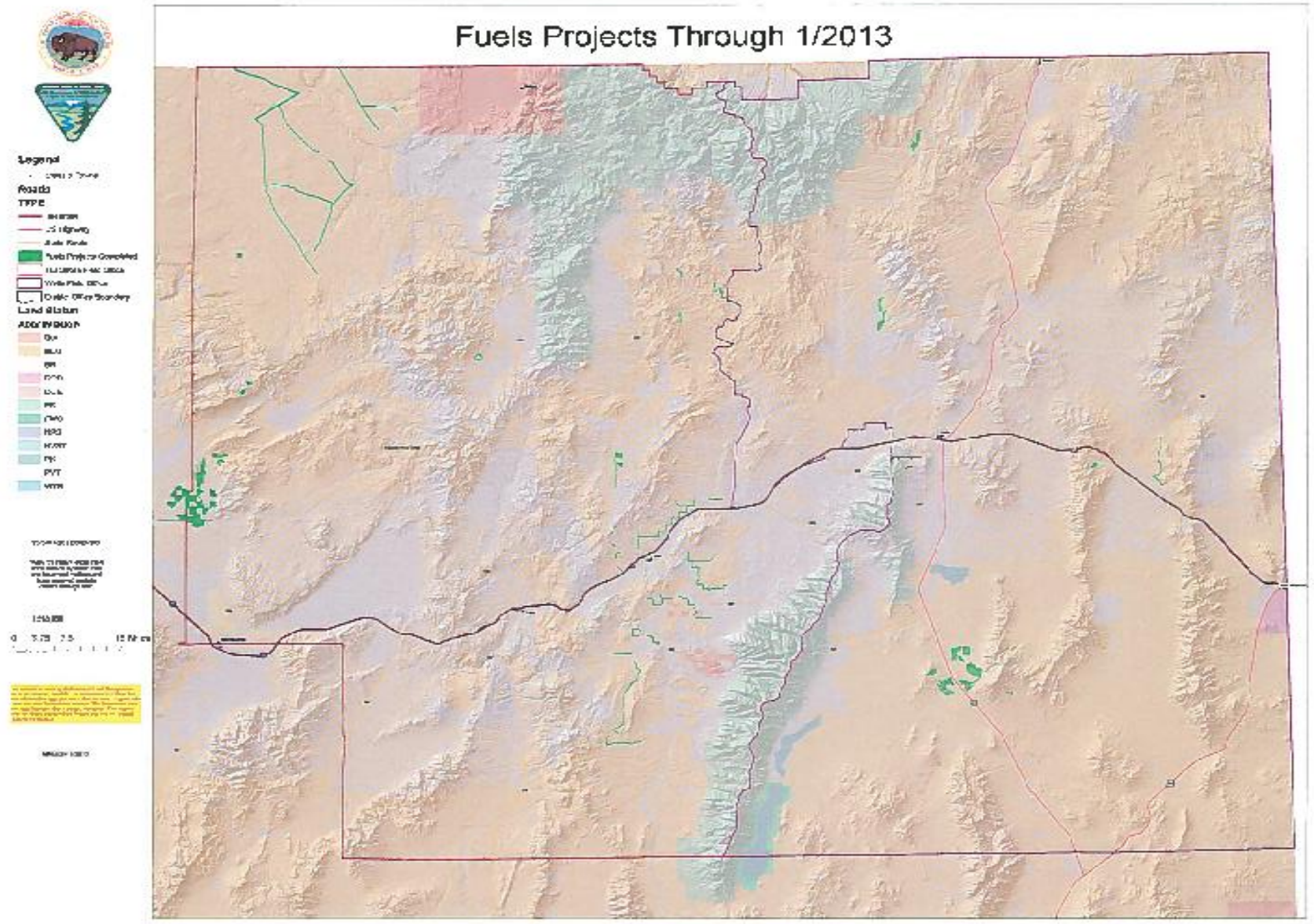
On November 28, 2011 the Nevada Fire Safe Council's Acting Executive Director; Mr. Butch Hayes received a memorandum from BLM's Chief of Acquisitions, Kenda Tucker informing him that the above referenced grant had been terminated. As of the effective date of termination, 45% of the original allocation of $589,340.00 had been spent.

	Original Deliverable	Adjusted Deliverable	Accomplishment
1.	Complete defensible space prescriptions and complete work on approximately 55 private properties.	Complete work on 44 to 55 private properties.	Nearly 200 lots were inspected and treated to implement defensible space principles. Worked closely with the Nevada Division of Forestry and the US forest Service.
2.	Complete work on Camp Stimpson property.	Treat 32 to 40 acres	Cooperated with the Nevada Division of Forestry to complete hazardous fuel treatment on this property. A total of acres were treated with final removal by prescribed fire on 12/22/2011.
3.	Explore possibility of multi-chapter organizational structure for the Spring Mountains National Recreation Area.	No adjustment	Chapter leaders were engaged in discussions about the development of a regional component to the administrative structure. Their reaction was that time could be better spent developing the effectiveness of the local chapters and a regional level would not be of assistance.
4.	Conduct eight educational programs and increase membership in each	Conduct 6 to 8 educational programs and increase	Conducted 12 educational programs connected to actual community clean-up and fuel reduction

	community chapter.	membership.	projects.
5	Improve communication and directed project planning with increased coordination between all partners.	No adjustment	Regularly scheduled chapter leader meetings with attendance from numerous cooperators. Agency partner involvement in community projects such as pine needle collection and curbside chipping. Collaborative efforts to achieve defensible space and fuel break project completion.
6.	Implement curb side chipping program and pine needle pick up program.	No adjustment	2010 : 87 properties, 10 cooperating agencies and 22 tons of hazardous fuel collected. 2011: 183 properties 10 agency partners and 180 cubic yards of hazardous fuel collected.

Other mitigation projects completed were fuels reduction projects completed by Nevada Division of Forestry under a Southern Nevada Public Lands Management Act (SNPLMA) grant totaling 59.22 acres in the Mount Charleston area in the following subdivisions: Echo, Rainbow Canyon, Mountain Springs, Trout Canyon, Old Town, Cathedral Rock, Cold Creek, and Mt. Charleston Baptist Church. The effectiveness of these projects was demonstrated by the fact that no occupied buildings were lost during the extensive Carpenter 1 wildfire that erupted in the Mount Charleston area and lasted nearly two weeks later on the summer of 2013.

Another mitigation fuels reduction project was completed by North Lake Tahoe Fire Protection District of Washoe County totaling 860 acres in the North Lake Tahoe Basin.


Fuels Projects Through 1/2013
Legend

Flyer describing the Unified Hazard Mitigation Assistance Program in Nevada.

Eligible Activities by Program

Eligible Activities	HMGP	PDM	FMA	RFC	SRL
1. Mitigation Projects	√	√	√	√	√
Property Acquisition and Structure Demolition	√	√	√	√	√
Property Acquisition and Structure Relocation	√	√	√	√	√
Structure Elevation	√	√	√	√	√
Mitigation Reconstruction					√
Dry Floodproofing of Historic Residential Structures	√	√	√	√	√
Dry Floodproofing of Non-residential Structures	√	√	√	√	
Minor Localized Flood Reduction Projects	√	√	√	√	√
Structural Retrofitting of Existing Buildings	√	√			
Non-structural Retrofitting of Existing Buildings and Facilities	√	√			
Safe Room Construction	√	√			
Infrastructure Retrofit	√	√			
Soil Stabilization	√	√			
Wildfire Mitigation	√	√			
Post-Disaster Code Enforcement	√				
5% Initiative Projects	√				
2. Hazard Mitigation Planning	√	√	√		
3. Management Costs	√	√	√	√	√

State Contacts

PDM, HMGP, FMA, RFC, & SRL

Elizabeth Ashby/Karen Johnson
NV Division of Emergency Management (DEM)
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(775) 687.0373 – Kijohnson@dps.state.nv.us

Dates & Deadlines HMA 2014 Cycle

May 2013	FEMA publication of HMA Guidelines (all future dates dependent of publication date)
May -June 2013	Nevada UHMA Training – locations and dates to be announced
June 2013	FEMA application period opens
July 1, 2013	Notice of Interest forms due to DEM
July 1, 2013	Establish eGrants access
Jul 26, 2013	Scope of Work & Benefit Cost Analysis in eGrants
Aug 13, 2013	Northern Nevada NHMPC meeting – Presentations to NHMPC
Aug 15, 2013	Southern Nevada NHMPC meeting – Presentations to NHMPC
Sep 20, 2013	Full Application Package with backup documentation in eGrants
Nov 12, 2013	NHMPC meeting – final review & ranking
Nov 15, 2013	**State submits application in eGrants to FEMA, application period closes**

Unified Hazard Mitigation Assistance Program in Nevada

FEMA

Hazard Mitigation Assistance (HMA)

HMA under FEMA's Mitigation Directorate unifies the pre-disaster grant programs to better support the overall goal of reducing the loss of life and property due to natural hazards.

The HMA programs: Pre-Disaster Mitigation (PDM), Flood Mitigation Assistance (FMA), Repetitive Flood Claims (RFC), and Severe Repetitive Loss (SRL) provide mitigation grants **annually** on an allocation and competitive basis to State, Territory, Tribal, and local entities. The new unified process achieves economies of scale and portfolio management for Federal, State, and local officials by aligning program requirements in a unified HMA guidance document. The intent of this alignment is to enhance the quality and efficiency of grant awards.

In addition, under the unified process, eligible sub applications submitted but not funded under a specific grant program may also be considered for another mitigation grant program(s).

Nevada Fire Safe Council

Living With Fire

Post-Disaster Hazard Mitigation Grant Program (HMGP)

The Hazard Mitigation Grant Program (HMGP) provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. Authorized under Section 404 of the Stafford Act and administered by FEMA, HMGP was created to reduce the loss of life and property due to natural disasters. The program enables mitigation measures to be implemented during the immediate recovery from a disaster.

http://www.fema.gov/government/grant/hmgp/

Pre-Disaster Mitigation (PDM) Program

The PDM program provides funds to States, Territories, Federally recognized Indian Tribal governments, and communities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. The goal of the PDM Program is to reduce overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations.

www.fema.gov/government/grant/pdm/index.shtm

Flood Mitigation Assistance (FMA) Program

The FMA grant program provides funding to States, federally recognized Indian Tribal governments, and communities so that cost-effective measures can be taken to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insured under the National Flood Insurance Program (NFIP). The long-term goal of FMA is to reduce or eliminate claims under the NFIP through mitigation activities.

www.fema.gov/government/grant/fma/index.shtm

Repetitive Flood Claims (RFC) Program

The RFC grant program was created with the goal of reducing flood damages to individual properties for which one or more claim payments for losses have been made under flood insurance coverage and that will result in the greatest savings to the NFIP (National Flood Insurance Fund) in the shortest period of time.

The RFC program is subject to the availability of appropriation funding. RFC grants will be awarded on a national basis without reference to State allocations, quotas, or other formula-based allocations of funds. The funding source for the RFC grant program is the NFIP.

www.fema.gov/government/grant/rfc/index.shtm

Severe Repetitive Loss (SRL) Program

The SRL program provides funding to reduce or eliminate the long-term risk of flood damage to severe repetitive residential structures insured under the NFIP. The definition of severe repetitive loss as applied to this program is a *residential property* that is covered under an NFIP flood insurance policy, and:

(a) That has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or

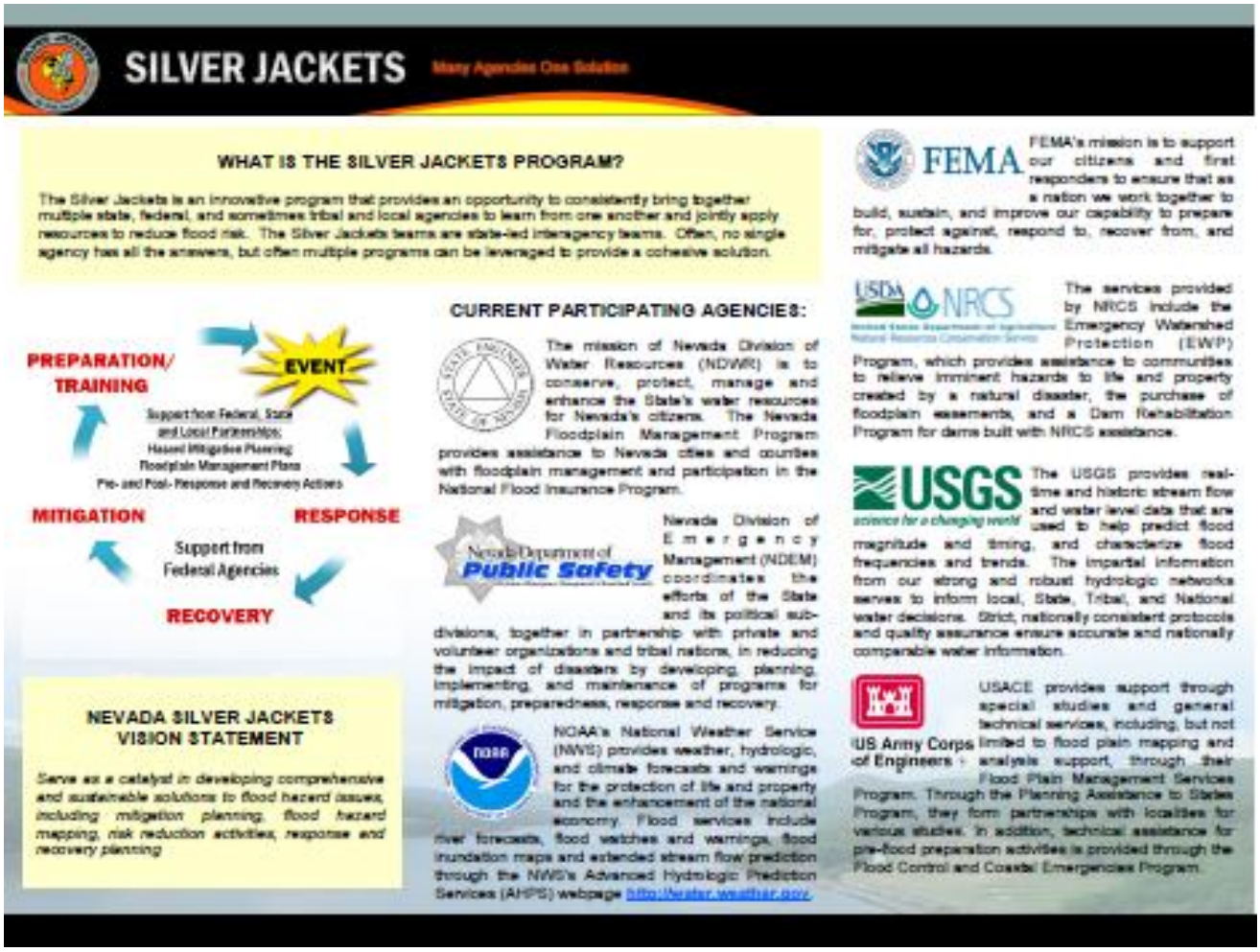
(b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both (a) and (b) above, at least two of the referenced claims must have occurred within any 1-year period, and must be greater than 10 days apart. The long-term goal of the SRL program is to reduce or eliminate claims under the NFIP through project activities that will result in the greatest savings to the NFIP in the shortest period of time.

www.fema.gov/government/grant/srl/index.shtm

FloodSmart.gov

Flyer describing the Silver Jackets Program in Nevada; lead agency is Nevada Division of Water Resources



SILVER JACKETS

Many Agencies One Solution

THE NEVADA SILVER JACKETS TEAM

A team of individuals from both federal and state agencies that come together to facilitate collaboration, share information, and leverage resources to identify and implement solutions to reduce flood risk in the State of Nevada.

SILVER JACKETS IN NEVADA

- The Nevada Silver Jackets Team is currently pursuing a charter signed by all member agencies

MISSION STATEMENT

- Enable effective and efficient sharing of information
- Increase and improve flood hazard identification, assessment, communication and outreach among local, regional, state and federal agencies
- Foster leveraging of available agency resources
- Develop more comprehensive state flood risk management policies and strategies
- Facilitate strategic, integrated, life-cycle mitigation actions to reduce the threat, vulnerability and consequences of flooding in Nevada
- Support Federal disaster response and recovery through development of mitigation strategies to capitalize on post-disaster mitigation opportunities
- Promote wise stewardship of taxpayers' investments

Contact Us
at the Nevada Silver Jackets Webpage:
http://www.nfrmp.us/state/factNevada.cfm

PRIMARY GOALS

- Ensure continuous collaboration for flood mitigation, response and recovery activities before, during and after flooding
- Provide a forum for examining all types of solutions for flood risk management, including both non-structural and structural solutions
- Learn about partner agency programs, identify limitations and opportunities, and combine programs to created integrated, comprehensive and sustainable solutions
- Create a multi-agency technical resource for state, regional and local agencies

WHY THE NAME SILVER JACKETS?

Traditionally, different agencies wear different colored jackets when responding to emergencies. For example, FEMA personnel wear blue and Corps personnel wear red. The name Silver Jackets is used to underscore the common mission of the diverse agencies involved.

NEVADA SILVER JACKETS Be Risk Aware! The Silver State

PHOTOS ON THE COVER:

Top: Downtown Reno on January 2, 1997 near the peak of flooding on the Truckee River (photo—Marilyn Newton, Reno Gazette Journal)
Bottom left: Homes at the Miracle Mile Mobile Home Park slide into Flamingo Wash, Las Vegas following heavy rains on July 8, 1999 (photo—Las Vegas Sun)
Bottom Right: Union Pacific train derailment in Lincoln County caused by the undercutting of tracks by flood waters in Meadow Valley Wash, January 2005 (photo—Las Vegas Review Journal)

NEVADA DITCHES from http://nevada.hometownlocator.com/features/cultural,class,canal,startrow,1.cfm		
Canal/Ditch Name	**County**	**Topgraphic Quadrangle Name**
	CARSON CITY	
Mexican Ditch	Carson City (city)	New Empire
	CHURCHILL	
Baily Drain	Churchill	Stillwater
Branch 5 Drain	Churchill	Grimes Point
Branch One Drain	Churchill	Indian Lakes
Carson Lake 1 Drain	Churchill	South of Fallon
Carson Lake A1 Extension Drain	Churchill	South of Fallon
Carson Lake Drain	Churchill	Grimes Point
D 3 Canal	Churchill	Indian Lakes
D Canal	Churchill	Grimes Point
D Line Canal	Churchill	Indian Lakes
E Line Canal	Churchill	Fallon
East Canal	Churchill	Foxtail Lake
East Lee Drain	Churchill	Carson Lake
Erb Drain	Churchill	Soda Lake East
F 2 Drain	Churchill	Indian Lakes

G 3 Canal	Churchill	South of Fallon
G Line Canal	Churchill	South of Fallon
G Line Drain	Churchill	South of Fallon
G Line Extension Drain	Churchill	South of Fallon
Goose Lake Bypass	Churchill	Foxtail Lake
Grimes Slough	Churchill	Grimes Point
Grimes Slough Extension	Churchill	Grimes Point
Gummow Drain	Churchill	Fallon
Harmon Drain	Churchill	Grimes Point
Harmon Number One Drain	Churchill	Grimes Point
Hazen Drain	Churchill	Hazen
Hunter Drain	Churchill	Foxtail Lake
Kent Drain	Churchill	Stillwater
Kent Lake Drain	Churchill	Stillwater
KX Lateral Canal	Churchill	Hazen
L 12 Canal	Churchill	Grimes Point
L 3 Drain	Churchill	Grimes Point
L D Drain	Churchill	Fallon

L Drain	Churchill	Grimes Point
L Line Canal	Churchill	Fallon
L2 Drain	Churchill	Fallon
Lead Bypass Canal	Churchill	Stillwater
Lead Lake Canal	Churchill	Foxtail Lake
Lower Diagonal Drain	Churchill	Lahontan Mountains
Lower Diagonal Number 1 Drain	Churchill	Grimes Point
Lower Humboldt Drain	Churchill	Ocala
Lower Soda Lake Drain	Churchill	Soda Lake East
Mills Drain	Churchill	Fallon
Mussi Drain	Churchill	Indian Lakes
N Line Canal	Churchill	Sheckler Reservoir
New River Drain	Churchill	Grimes Point
New River Extension Branch Drain	Churchill	Fallon
Norton Drain	Churchill	Stillwater
O Line Canal	Churchill	Indian Lakes
Paiute Diversion Drain	Churchill	Stillwater
Paiute Drain	Churchill	Stillwater

Patrick Drain	Churchill	Stillwater
Pierson Slough	Churchill	Carson Lake
Ponte Drain	Churchill	Soda Lake East
R Drain	Churchill	Soda Lake East
R Line Canal	Churchill	Grimes Point
Rice Ditch	Churchill	Carson Lake
Rock Dam Ditch	Churchill	Lahontan Dam
Rock Dam Ditch Number 1	Churchill	Lahontan Dam
S 2 Canal	Churchill	Stillwater
S 5 A Drain	Churchill	Stillwater
S 5 Canal	Churchill	Indian Lakes
S 7 Canal	Churchill	Grimes Point
S Line Canal	Churchill	Grimes Point
Shaffner Branch	Churchill	Indian Lakes
Shaffner Drain	Churchill	Indian Lakes
Sheckler 1 Drain	Churchill	Fallon
Sheckler Drain	Churchill	Fallon
Sky Lateral	Churchill	Lahontan Dam

Soda Lake Drain	Churchill	Soda Lake East
S-One Canal	Churchill	Grimes Point
South Upper Soda Lake Drain	Churchill	Fallon
Stillwater Point Reservoir Diversion Canal	Churchill	Lahontan Mountains
Stillwater Slough Cutoff	Churchill	Stillwater
S-Two Canal	Churchill	Grimes Point
Swope Drain	Churchill	Stillwater
T Line Canal	Churchill	Soda Lake East
Thoma Drain	Churchill	Fallon
UID Drain	Churchill	Soda Lake East
Upper Paiute Drain	Churchill	Indian Lakes
Upper Paiute Number Two	Churchill	Stillwater
Upper Soda Lake 1 Drain	Churchill	Fallon
Upper Soda Lake Drain	Churchill	Fallon
Upper West Side Drain	Churchill	Sheckler Reservoir
V Line Canal	Churchill	Sheckler Reservoir
Vencill Drain	Churchill	Indian Lakes
Wade Drain	Churchill	Soda Lake East

West Canal	Churchill	Foxtail Lake
West Carson Lake Drain	Churchill	South of Fallon
West Lee Drain	Churchill	Carson Lake
Westside Drain	Churchill	Fallon
Winsett Drain	Churchill	Lahontan Mountains
A Line Canal	Churchill	Fallon
	CLARK	
Boulder City Lateral	Clark	Boulder Beach
Bunkerville Ditch	Clark	Mesquite
Henderson Lateral	Clark	Henderson
Las Vegas Valley Lateral	Clark	Henderson
	DOUGLAS	
Allerman Canal	Douglas	Gardnerville
Big Ditch	Douglas	Minden
Edna Wilslef Ditch	Douglas	Gardnerville
Falke and Tillman Ditch	Douglas	Carters Station
Fredericksburg Ditch	Douglas	Woodfords
Heise Company Ditch	Douglas	Minden

Heyburn Ditch	Douglas	Genoa
Highline Ditch	Douglas	Risue Canyon
Lower Old Virginia Canal	Douglas	Gardnerville
Middle Ditch	Douglas	Minden
Middle River Ditch	Douglas	Minden
Old Virginia Canal	Douglas	Gardnerville
Park and Bull Slough	Douglas	Minden
Saint Louis Straight Ditch	Douglas	Minden
Topaz Canal	Douglas	Long Dry Canyon
Upper New Virginia Canal	Douglas	Gardnerville
	ELKO	
Agency Canal	Elko	Owyhee
Agency Canal	Elko	The Point
Duck Valley Canal	Elko	The Point
Hankins Bellinger Ditch	Elko	West of Lee
High Line Canal	Elko	Squaw Valley Ranch
Hilton Ditch	Elko	Te-Moak Well
Homer Ditch	Elko	Dry Creek Reservoir

Main Canal	Elko	Owyhee
Main Canal	Elko	Mountain View Lake
O'Connells Ditch	Elko	Green Mountain
Sheep Creek Ditch	Elko	The Point
Suttles Ditch	Elko	Green Mountain
Swamp Ditch	Elko	Noon Rock
Thacker Lateral	Elko	The Point
White Rock Lateral	Elko	The Point
White Rock Lateral	Elko	The Point
	EUREKA	
Anderson Canal	Eureka	Beowawe
Corbett Canal	Eureka	Beowawe
Highline Canal	Eureka	Beowawe
Merchant Canal	Eureka	Bobs Flat
Rose Canal	Eureka	Dunphy
Westside Ditch	Eureka	The Geysers
	HUMBOLDT	
Big Cedar Creek Ditch	Humboldt	Schoolhouse Butte

Bull Creek Ditch	Humboldt	Schoolhouse Butte
French Canal	Humboldt	Pole Creek
Hammond Ditch	Humboldt	Red House Flat East
Humboldt Canal	Humboldt	Golconda Butte
Knott Creek Channel	Humboldt	Knott Creek
Little Cedar Creek Ditch	Humboldt	Schoolhouse Butte
Lyng Ditch	Humboldt	Willow Point
	LANDER	
Blue House Ditch	Lander	Argenta
Fred Ahles Ditch	Lander	Dutch Flat
Gimble Four Ditch	Lander	Battle Mountain
Gimble One Ditch	Lander	Battle Mountain
Gimble Two Ditch	Lander	Battle Mountain
Lower Twenty-five Ditch	Lander	Battle Mountain
Rock Creek Ditch	Lander	Dunphy
T-S Ditch	Lander	Stony Point
Twenty Five Ditch	Lander	Battle Mountain
White House Ditch	Lander	Argenta

	LINCOLN	
Alamo Company Canal	Lincoln	Alamo
Alamo Company East Ditch	Lincoln	Alamo
Garden Springs Pipe Line	Lincoln	Blue Nose Peak
Mesquite Ditch	Lincoln	Mesquite
New East Ditch	Lincoln	Ash Springs
Number Four Ditch	Lincoln	Ash Springs
Number One Ditch	Lincoln	Ash Springs
Number Three Ditch	Lincoln	Ash Springs
	LYON	
A Drain	Lyon	Fernley East
Back Fox Ditch	Lyon	Yerington
Buckland Ditch	Lyon	Silver Springs South
Campbell Ditch	Lyon	Mason Butte
Colony Ditch	Lyon	Oreana Peak
D and GW Ditch	Lyon	Wilson Canyon
Dayton Town Ditch	Lyon	Dayton
East Campbell Ditch	Lyon	Mason Butte

Fernley Drain	Lyon	Fernley East
Fox Ditch	Lyon	Yerington
Gee Ditch	Lyon	Flowery Peak
Greenwood Ditch	Lyon	Yerington
Hall Ditch	Lyon	Yerington
High Ditch	Lyon	Yerington
Hillbun Ditch	Lyon	Wilson Canyon
Houghman and Howard Ditch	Lyon	Churchill Butte
Joggles Ditch	Lyon	Hinkson Slough
K2B Canal	Lyon	Fernley East
Kelly Alkali Ditch	Lyon	Wilson Canyon
Koch Ditch	Lyon	Misfits Flat
Lee Sanders Ditch	Lyon	Wilson Canyon
Lower Charlebois Ditch	Lyon	Yerington SE
Main Fox Ditch	Lyon	Yerington
McLeod Ditch	Lyon	Yerington
Merritt Ditch	Lyon	Hinkson Slough
Mickey Ditch	Lyon	Yerington

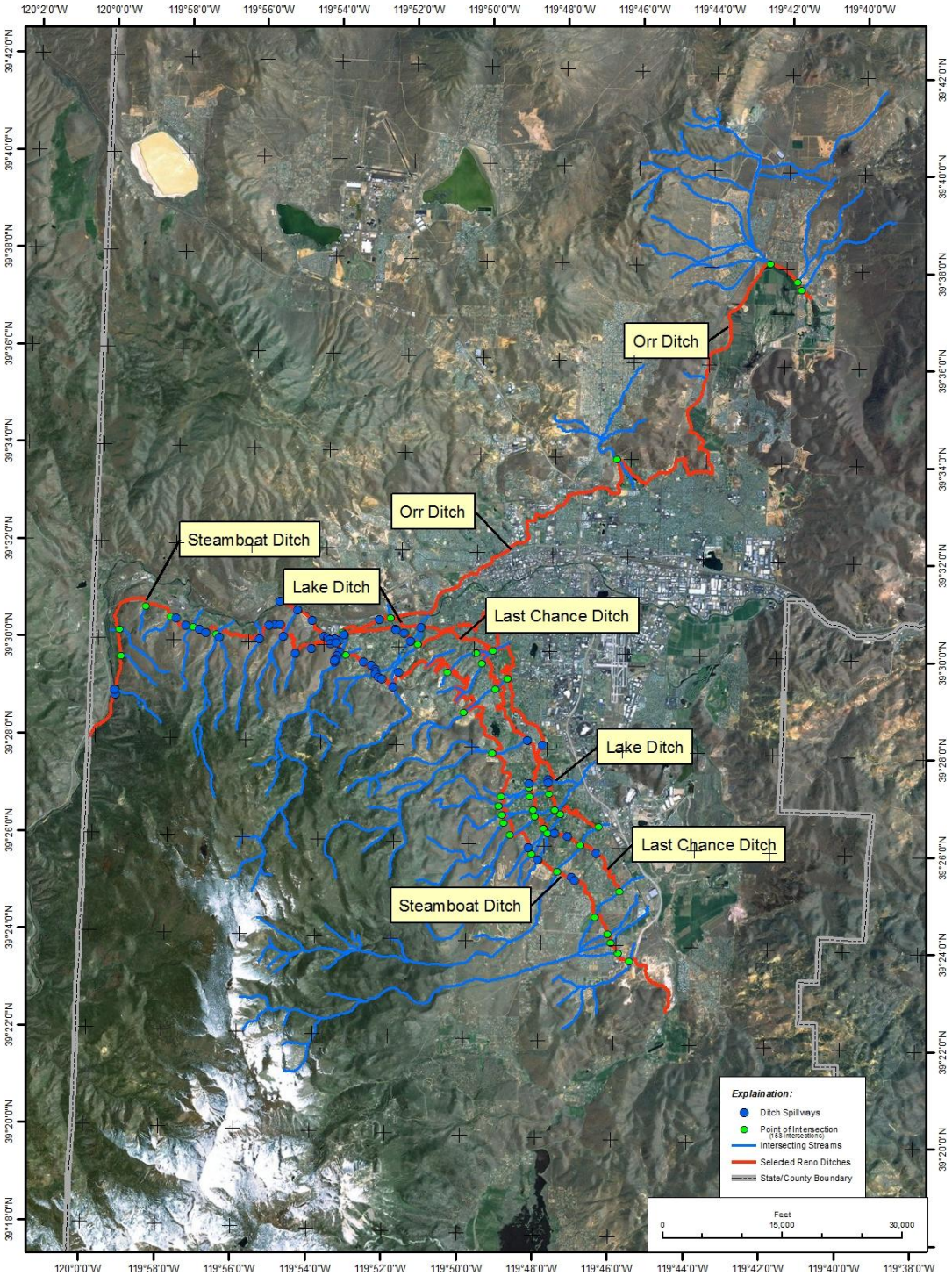
Nelson Ditch	Lyon	Yerington
Nichols-Merritt Ditch	Lyon	Mason Butte
Plymouth Canal	Lyon	Smith
Randall Ditch	Lyon	Dayton
Sand Ridge Ditch	Lyon	Mason Butte
Sanders Canal	Lyon	Wilson Canyon
Saroni Canal	Lyon	Desert Creek Ranch
Spragg-Alcorn-Bewley Ditch	Lyon	Mason Butte
Spragg-Woodcock Ditch	Lyon	Yerington
Streiff Drain	Lyon	Fernley East
Strosnider East Ditch	Lyon	Yerington SE
Strosnider West Ditch	Lyon	Yerington SE
Truckee Canal	Lyon	Fernley East
Tunnel Ditch	Lyon	Wilson Canyon
Upper Cardelli Ditch	Lyon	Flowery Peak
Upper Charlebois Ditch	Lyon	Yerington SE
Wabuska Drain	Lyon	Mason Butte
West Campbell Ditch	Lyon	Mason Butte

West Hyland Ditch	Lyon	Mason Butte
West Side Canal	Lyon	Wilson Canyon
Wiley Ditch	Lyon	Nye Canyon
Woods Ditch	Lyon	Yerington
	MINERAL	
Canal Number One	Mineral	Schurz
Canal Number Two	Mineral	Schurz
Drain Number One	Mineral	Schurz
Lateral One-A	Mineral	Schurz
Lateral Two-A	Mineral	Schurz
Lateral Two-B	Mineral	Schurz
Lateral Two-D	Mineral	Schurz
Lateral Two-E	Mineral	Schurz
	PERSHING	
American Canal	Pershing	Lovelock
Army Drain	Pershing	Granite Point
Big Five Canal	Pershing	Wildhorse Pass
Fairview Slough	Pershing	Lovelock

Graveyard Drain	Pershing	Lovelock
Irish-American Canal	Pershing	Lovelock
Johnson Drain	Pershing	Lovelock
Lakeshore Ditch	Pershing	Granite Point
Lovelock Drain	Pershing	Lovelock
Lower Taylor Ditch	Pershing	West of Lovelock
Old Channel Canal	Pershing	Lovelock
Pitt-Taylor Diversion Canal	Pershing	Imlay
Reed Ditch	Pershing	Lovelock
Rodgers Ditch	Pershing	Lovelock
Rudell Ditch	Pershing	Lovelock
Seven Ditch	Pershing	Wildhorse Pass
Seventeen Ditch	Pershing	Wildhorse Pass
Sommers Ditch	Pershing	Wildhorse Pass
Taylor Canal	Pershing	Lovelock
Toulon Drain	Pershing	Granite Point
Union Canal	Pershing	Lovelock
Union Canal	Pershing	Lovelock

Union Rodgers Canal	Pershing	Lovelock
Willow Slough	Pershing	West of Lovelock
Young Canal	Pershing	Lovelock
	STOREY	
McCarran Ditch	Storey	Patrick
	WASHOE	
Big Ditch	Washoe	Virginia City
Chandler Ditch	Washoe	Steamboat
Cochran Ditch	Washoe	Mount Rose NE
Coldron Ditch	Washoe	Verdi
Crane Ditch	Washoe	Steamboat
Highland Ditch	Washoe	Reno
Lake Ditch	Washoe	Reno
Last Chance Ditch	Washoe	Reno
North Truckee Drain	Washoe	Vista
North Truckee Irrigation Ditch	Washoe	Vista
Orr Ditch	Washoe	Vista
Pioneer Ditch	Washoe	Vista

Prosser Valley Ditch	Washoe	Reno
Pyramid Lake Fishway	Washoe	Pah Rah Mountain
Steamboat Ditch	Washoe	Verdi
	WHITE PINE	
Chin Creek Ditch	White Pine	Chin Creek Reservoir
Duck Creek Overflow Canal	White Pine	McGill
Dunham McGill Ditch	White Pine	McGill
Hamblin Valley Flood Water Wash Ditch	White Pine	Tweedy Wash
John Magnuson Ditch	White Pine	Mattier Creek



Map image of ditches in the Reno area.

Instructions for Using the Plan Review Crosswalk for Review of Standard State Hazard Mitigation Plans

Attached is a Plan Review Crosswalk based on the ***Multi-Hazard Mitigation Planning Guidance Under the Disaster Mitigation Act of 2000***, published by FEMA, with revisions dated November 2006. This Plan Review Crosswalk is consistent with the *Disaster Mitigation Act of 2000* (P.L. 106-390), enacted October 30, 2000 and *44 CFR Part 201 – Mitigation Planning, Interim Final Rule* (the Rule), published February 26, 2002.

SCORING SYSTEM

N – Needs Improvement: The plan does not meet the minimum for the requirement. Reviewer's comments must be provided.

S – Satisfactory: The plan meets the minimum for the requirement. Reviewer's comments are encouraged, but not required.

Each requirement includes separate elements. All elements of a requirement must be rated "Satisfactory" in order for the requirement to be fulfilled and receive a summary score of "Satisfactory." A "Needs Improvement" score on elements shaded in gray (recommended but not required) will not preclude the plan from passing.

Optional matrices for assisting in the review of sections on profiling hazards and assessing vulnerability are found at the end of the Plan Review Crosswalk.

The example below illustrates how to fill in the Plan Review Crosswalk.

Example

Assessing Vulnerability by Jurisdiction

Requirement §201.4(c)(2)(ii): *[The State risk assessment **shall** include an] overview and analysis of the State's vulnerability to the hazards described in this paragraph (c)(2), based on estimates provided in local risk assessments … . The State **shall** describe vulnerability in terms of the jurisdictions most threatened by the identified hazards, and most vulnerable to damage and loss associated with hazard event.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the plan describe the State's vulnerability based on information from the local risk assessments?	Section 3, pp. 12-28	The plan includes a description of local vulnerable structures. The plan presented a vulnerability summary by regions in the state. This information was collected from the approved plans on file.		✓
B. Does the plan present information on those jurisdictions that face the most risk?	Section 3 pp. 30-36	The vulnerability description did not indicate which jurisdictions were the most vulnerable. **Required Revisions:** • Use the information provided in the summaries to determine which jurisdictions are most threatened by the identified hazards. • Identify which jurisdictions have suffered or are likely to suffer the most losses. • If data are not readily available, note these data limitations in the plan. Include actions in the mitigation strategy to obtain these data for the plan update.	✓	
		SUMMARY SCORE	✓	

Standard State Hazard Mitigation Plan Review and Approval Status

State Point of Contact: **Elizabeth Ashby**	**Address:** **2478 Fairview Dr.** **Carson City, NV 89701**
Title: **SHMO**	
Agency: **Division of Emergency Management**	
Phone Number: **775-687-0314**	**E-Mail:** **eashby@dps.state.nv.us**

FEMA Reviewer: Juliette Hayes	**Title:**	**Date:**
Date Received in FEMA Region [Insert #]		
Plan Not Approved		
Plan Approved		
Date Approved		

STANDARD STATE HAZARD MITIGATION PLAN SUMMARY CROSSWALK

The plan cannot be approved if the plan has not been formally adopted.

Each requirement includes separate elements. All elements of the requirement must be rated "Satisfactory" in order for the requirement to be fulfilled and receive a score of "Satisfactory." Elements of each requirement are listed on the following pages of the Plan Review Crosswalk. A "Needs Improvement" score on elements shaded in gray (recommended but not required) will not preclude the plan from passing. Reviewer's comments must be provided for requirements receiving a **"Needs Improvement"** score.

SCORING SYSTEM

Please check one of the following for each requirement.

N – Needs Improvement: The plan does not meet the minimum for the requirement. Reviewer's comments must be provided.

S – Satisfactory: The plan meets the minimum for the requirement. Reviewer's comments are encouraged, but not required.

Prerequisite	NOT MET	MET
Adoption by the State: §201.4(c)(6) and §201.4(c)(7)		

Planning Process	N	S
Documentation of the Planning Process: §201.4(c)(1)		
Coordination Among Agencies: §201.4(b)		
Program Integration: §201.4(b)		

Risk Assessment	N	S
Identifying Hazards: §201.4(c)(2)(i)		
Profiling Hazards: §201.4(c)(2)(i)		
Assessing Vulnerability by Jurisdiction: §201.4(c)(2)(ii)		
Assessing Vulnerability of State Facilities: §201.4(c)(2)(ii)		
Estimating Potential Losses by Jurisdiction: §201.4(c)(2)(iii)		
Estimating Potential Losses of State Facilities: §201.4(c)(2)(iii)		

Mitigation Strategy	N	S
Hazard Mitigation Goals: §201.4(c)(3)(i)		
State Capability Assessment: §201.4(c)(3)(ii)		
Local Capability Assessment: §201.4(c)(3)(ii)		
Mitigation Actions: §201.4(c)(3)(iii)		
Funding Sources: §201.4(c)(3)(iv)		

Coordination of Local Mitigation Planning	N	S
Local Funding and Technical Assistance: §201.4(c)(4)(i)		
Local Plan Integration: §201.4(c)(4)(ii)		
Prioritizing Local Assistance: §201.4(c)(4)(iii)		

Severe Repetitive Loss Mitigation Strategy
(only required for 90/10 under FMA & SRL)

	N	S
Repetitive Loss Mitigation Strategy: §201.4(c)(3)(v)		
Coordination with Repetitive Loss Jurisdictions §201.4(c)(3)(v)		

Plan Maintenance Process	N	S
Monitoring, Evaluating, and Updating the Plan: §201.4(c)(5)(i)		
Monitoring Progress of Mitigation Activities: §201.4(c)(5)(ii) and (iii)		

STANDARD STATE HAZARD MITIGATION PLAN APPROVAL STATUS

PLAN NOT APPROVED	
PLAN APPROVED	

See Reviewer's Comments

PREREQUISITE

Adoption by the State

Requirement §201.4(c)(6): *The plan **must** be formally adopted by the State prior to submittal to [FEMA] for final review and approval.*

Requirement §201.4(c)(7): *The plan **must** include assurances that the State will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c). The State will amend its plan whenever necessary to reflect changes in State or Federal laws and statutes as required in 44 CFR 13.11(d).*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Has the State formally adopted the **new or updated** plan?	Appendix A			
B. Does the plan provide assurances that the State will **continue to** comply with all applicable Federal statutes and regulations during the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c), and will amend its plan whenever necessary to reflect changes in State or Federal laws and statutes as required in 44 CFR 13.11(d)?	Section 1.2.4, p. 1-8			
		SUMMARY SCORE		

PLANNING PROCESS: *§201.4(b): An effective planning process is essential in developing and maintaining a good plan.*

Documentation of the Planning Process

Requirement §201.4(c)(1): *[The State plan **must** include a] description of the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how other agencies participated.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the plan provide a narrative description of how the **new or updated** plan was prepared?	Section 2.1.1, p. 2-1			
B. Does the **new or updated** plan indicate who was involved in the **current** planning process?	Section 2.1.2, p. 2-2			
C. Does the **new or updated** plan indicate how other agencies participated in the **current** planning process?	Section 2.1.3, p. 2-5			
D. Does the updated plan document how the planning team reviewed and analyzed each section of the plan?	Section 2.1.4, p. 2-7			
E. Does the updated plan indicate for each section whether or not it was revised as part of the update process?	Sections 2.1.4, p.2-7 and 2.1.5, p. 2-15			
		SUMMARY SCORE		

Coordination Among Agencies

Requirement §201.4(b): *The [State] mitigation planning process* ***should*** *include coordination with other State agencies, appropriate Federal agencies, interested groups, and … .* ***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan describe how Federal and State agencies were involved in the **current** planning process?	Section 2.1.3, Table 2-2, p. 2-5; Section 2.2.1, p. 2-16			
B. Does the **new or updated** plan describe how interested groups (e.g., businesses, non-profit organizations, and other interested parties) were involved in the **current** planning process?	Section 2.2.2, p. 2-17	.		
C. Does the updated plan discuss how coordination among Federal and State agencies changed since approval of the previous plan?	Section 2.2.3, p. 2-18			
		SUMMARY SCORE		

Program Integration

Requirement §201.4(b): *[The State mitigation planning process* ***should****] be integrated to the extent possible with other ongoing State planning efforts as well as other FEMA mitigation programs and initiatives.* ***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan describe how the State mitigation planning process is integrated with other ongoing State planning efforts?	Section 2.3.1, p. 2-20; Table 2-6, p. 2-20	.		
B. Does the **new or updated** plan describe how the State mitigation planning process is integrated with FEMA mitigation programs and initiatives?	Section 2.3.3, p. 2-23; Table 2-7, p. 2-24			
		SUMMARY SCORE		

RISK ASSESSMENT: *§201.4(c)(2): [The State plan must include a risk assessment] that provides the factual basis for activities proposed in the strategy portion of the mitigation plan. Statewide risk assessments must characterize and analyze natural hazards and risks to provide a statewide overview. This overview will allow the State to compare potential losses throughout the State and to determine their priorities for implementing mitigation measures under the strategy, and to prioritize jurisdictions for receiving technical and financial support in developing more detailed local risk and vulnerability assessments.*

Identifying Hazards

Requirement §201.4(c)(2)(i): *[The State risk assessment **shall** include an] overview of the type … of all natural hazards that can affect the State … .*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan provide a description of the type of **all natural hazards** that can affect the State? If the hazard identification omits (without explanation) any hazards commonly recognized as threats to the State, this part of the plan cannot receive a Satisfactory score.	Section 3.2.1, p. 3-3 and Table 3-1, p. 3-3			
		SUMMARY SCORE		

Profiling Hazards

Requirement §201.4(c)(2)(i): *[The State risk assessment **shall** include an overview of the] location of all natural hazards that can affect the State, including information on previous occurrences of hazard events, as well as the probability of future hazard events, using maps where appropriate … .*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the risk assessment identify the **location** (i.e., geographic area affected) of each natural hazard addressed in the **new or updated** plan?	Section 3.3, p. 3-9 to p. 3-162			
B. Does the **new or updated** plan provide information on **previous occurrences** of each hazard addressed in the plan?	Section 3.3, p. 3-9 to 3-162			
C. Does the **new or updated** plan include the **probability of future events** (i.e., chance of occurrence) for each hazard addressed in the plan?	Section 3.3, p. 3-9 to 3-162			
		SUMMARY SCORE		

Assessing Vulnerability

Requirement §201.4(c)(2)(ii): *[The State risk assessment **shall** include an] overview and analysis of the State's vulnerability to the hazards described in this paragraph (c)(2), based on estimates provided in local risk assessments as well as the State risk assessment. The State **shall** describe vulnerability in terms of the jurisdictions most threatened by the identified hazards, and most vulnerable to damage and loss associated with hazard events. State owned critical or operated facilities located in the identified hazard areas shall also be addressed … .*

Requirement §201.4(d): Plan must be reviewed and revised to reflect changes in development…

Assessing Vulnerability by Jurisdiction

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan describe the State's vulnerability based on estimates provided in local risk assessments as well as the State risk assessment?	Section 3.5.2 to 3.5.4, p. 3-165 to p. 3-170			
B. Does the **new or updated** plan describe the State's vulnerability in terms of the jurisdictions most threatened and most vulnerable to damage and loss associated with hazard event(s)?	Section 3.5.4, p. 3-169, Table 3-35, p. 3-169; Sections 3.7.1, 3.7.2, 3.7.3; Tables 3-41 through 3-47 on pp. 3-179 to 3-190; Fig. 3-41 on p. 3-181			
C. Does the updated plan explain the process used to analyze the information from the local risk assessments, as necessary?	Section 3.5.4, p.3-169; Table 3-35, p. 3-169 ; Sec. 3.7.2, p. 184; Sec. 3.7.3, p. 3-188; Table 3-47, p. 3-190			
D. Does the updated plan reflect changes in development for jurisdictions in hazard-prone areas?	Mainly Sec. 3.5.5, pp. 3-170 to 3- 171. Also Sec. 3.5.2, pp. 3-165 to 3-168; Sec. 3.5.3, p. 3-168; Sec. 3.5.4, p. 3-169;			
		SUMMARY SCORE		

Assessing Vulnerability of State Facilities

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan describe the types of State-owned or operated critical facilities located in the identified hazard areas?	Section 3.6.1, p. 3-172			
		SUMMARY SCORE		

Estimating Potential Losses

Requirement §201.4(c)(2)(iii): *[The State risk assessment **shall** include an] overview and analysis of potential losses to the identified vulnerable structures, based on estimates provided in local risk assessments as well as the State risk assessment. The State **shall** estimate the potential dollar losses to State owned or operated buildings, infrastructure, and critical facilities located in the identified hazard areas.*

Requirement §201.4(d): Plan must be reviewed and revised to reflect changes in development…

Estimating Potential Losses by Jurisdiction

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan present an overview and analysis of the potential losses to the identified vulnerable structures?	Overview: Sec. 3.5.1, p. 3-165; Analysis: Sec. 3.5.2, p. 3-165; and Sec. 3.7, p. 3-177 to 3-190; Tables 3-42 to 3-47, p. 3-180 to 3-190.			
B. Are the potential losses based on estimates provided in local risk assessments as well as the State risk assessment?	Sec. 3.5.3, p. 168; Sec. 3.5.4, p. 3-69; Table 3-35, p. 3-169			
C. Does the updated plan reflect the effects of changes in development on loss estimates?	Section 3.5.5, p. 3-170			
		SUMMARY SCORE		

Estimating Potential Losses of State Facilities

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan present an estimate of the potential dollar losses to State-owned or operated buildings, infrastructure, and critical facilities in the identified hazard areas?	Section 3.6.1, p. 3-172; Table 3-37, p. 3-172; Section 3.6.3, p. 3-173 to 3-176 ; Tables 3-38 to 3-40, p. 3-174 to 3-175			
		SUMMARY SCORE		

MITIGATION STRATEGY: *§201.4(c)(3) [To be effective the plan must include a] Mitigation Strategy that provides the State's blueprint for reducing the losses identified in the risk assessment.*

Hazard Mitigation Goals

Requirement §201.4(c)(3)(i): *[The State mitigation strategy **shall** include a] description of State goals to guide the selection of activities to mitigate and reduce potential losses.*

Requirement §201.4(d): Plan must be reviewed and revised to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities…

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan provide a description of State mitigation **goals** that guide the selection of mitigation activities?	Section 4.1.1, p. 4-2, Tables 4-1 and 4-2, pp. 4-3 to 4-13			
B. Does the updated plan demonstrate that the goals were assessed and either remain valid or have been revised?	Section 4.1.1 p. 4-2, Table 4-1, pp. 4-3 to 4-13			
		SUMMARY SCORE		

State Capability Assessment ***Requirement §201.4(c)(3)(ii):*** *[The State mitigation strategy **shall** include a] discussion of the State's pre-and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including: an evaluation of State laws, regulations, policies, and programs related to hazard mitigation as well as to development in hazard-prone areas [and] a discussion of State funding capabilities for hazard mitigation projects … .*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan include an evaluation of the State's **pre-disaster** hazard management policies, programs, and capabilities?	Section 4.2.1, p. 4-14 and Table 4-3, p. 4-15 to 4-30			
B. Does the **new or updated** plan include an evaluation of the State's **post-disaster** hazard management policies, programs, and capabilities?	Section 4.2.1, p. 4-14 and Table 4-3, p. 4-15 to 4-30			
C. Does the **new or updated** plan include an evaluation of the State's policies related to **development in hazard-prone areas**?	Section 4.2.2, p. 4-31			
D. Does the **new or updated** plan include a discussion of State **funding capabilities** for hazard mitigation projects?	Section 4.2.3, p. 4-31			
E. Does the updated plan address any hazard management capabilities of the State that have changed since approval of the previous plan?	Section 4.2.4, pp. 4-31 to 4-38			
		SUMMARY SCORE		

Local Capability Assessment

Requirement §201.4(c)(3)(ii): *[The State mitigation strategy **shall** include] a general description and analysis of the effectiveness of local mitigation policies, programs, and capabilities.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan present a general description of the local mitigation policies, programs, and capabilities?	Section 4.3.1, p. 4-39			
B. Does the **new or updated** plan provide a general analysis of the effectiveness of local mitigation policies, programs, and capabilities?	Section 4.3.2, p. 4-41			
		SUMMARY SCORE		

Mitigation Actions

Requirement §201.4(c)(3)(iii): *[State plans **shall** include an] identification, evaluation, and prioritization of cost-effective, environmentally sound, and technically feasible mitigation actions and activities the State is considering and an explanation of how each activity contributes to the overall mitigation strategy. This section **should** be linked to local plans, where specific local actions and projects are identified.*

Requirement §201.4(d): Plan must be reviewed and revised to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities…

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan identify cost-effective, environmentally sound, and technically feasible mitigation actions and activities the State is considering?	Section 4.4.1, p. 4-44			
B. Does the **new or updated** plan evaluate these actions and activities?	Section 4.4.2, p. 4-44			
C. Does the **new or updated** plan prioritize these actions and activities?	Section 4.4.2, p. 4-44; Table 4-10, pp. 4-47 to 4-61			
D. Does the **new or updated** plan explain how each activity contributes to the overall State mitigation strategy?	Section 4.4.2; Table 4-10, p 4-47 to 4-61			
E. Does the mitigation strategy **in the new or updated** section reflect actions and projects identified in local plans?	Section 4.4.3, p. 4-63	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		
		SUMMARY SCORE		

Funding Sources

Requirement §201.4(c)(3)(iv): *[The State mitigation strategy **shall** include an] identification of current and potential sources of Federal, State, local, or private funding to implement mitigation activities.*

Element	Location in the **Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan identify **current** sources of Federal, State, local, or private funding to implement mitigation activities?	Section 4.5.1, p.4-64; Table 4-11, p. 4-48			
B. Does the **new or updated** plan identify **potential** sources of Federal, State, local, or private funding to implement mitigation activities?	Section 4.5.2, p. 65; Table 4-12, p. 4-66			
C. Does the updated plan identify the sources of mitigation funding used to implement activities in the mitigation strategy since approval of the previous plan?	Table 4-11, p. 3-65; Appendix P			
		SUMMARY SCORE		

COORDINATION OF LOCAL MITIGATION PLANNING

Local Funding and Technical Assistance

Requirement §201.4(c)(4)(i): *[The section on the Coordination of Local Mitigation Planning **must** include a] description of the State process to support, through funding and technical assistance, the development of local mitigation plans.*

Element	Location in the **Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan provide a description of the State process to support, through funding and technical assistance, the development of local mitigation plans?	Section 5.1.1, p. 5-1 to 5-2			
B. Does the updated plan describe the funding and technical assistance the State has provided in the past three years to assist local jurisdictions in completing approvable mitigation plans?	Sec. 5.1.1, p. 5-1 to 5-2; Sec. 5.1.2, p. 5-9; Fig. 5-1, p. 5-2			
		SUMMARY SCORE		

Local Plan Integration

Requirement §201.4(c)(4)(ii): *[The section on the Coordination of Local Mitigation Planning **must** include a] description of the State process and timeframe by which the local plans will be reviewed, coordinated, and linked to the State Mitigation Plan.*

Requirement §201.4(d): Plan must be reviewed and revised to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities…

Element	Location in the **Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan provide a description of the **process and timeframe** the State established to **review** local plans?	Section 5.2.1, p. 5-11			
B. Does the **new or updated** plan provide a description of the **process and timeframe** the State established to **coordinate and link** local plans to the State Mitigation Plan?	Section 5.2.2, p. 5-11			
		SUMMARY SCORE		

Prioritizing Local Assistance

Requirement §201.4(c)(4)(iii): *[The section on the Coordination of Local Mitigation Planning **must** include] criteria for prioritizing communities and local jurisdictions that would receive planning and project grants under available funding programs, which **should** include consideration for communities with the highest risks, repetitive loss properties, and most intense development pressures.*

*Further, that for non-planning grants, a principal criterion for prioritizing grants **shall** be the extent to which benefits are maximized according to a cost benefit review of proposed projects and their associated costs.*

Requirement §201.4(d): Plan must be reviewed and revised to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities…

Element	Location in the **Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan provide a description of the criteria for prioritizing those communities and local jurisdictions that would receive planning and project grants under available mitigation funding programs?	Section 5.3.1.1 p. 5-13			
B. **For the new or updated plan, do** the prioritization criteria include, for non-planning grants, the consideration of the extent to which benefits are maximized according to a cost benefit review of proposed projects and their associated cost?	Section 5.3.2, p. 5-15			
C. **For the new or updated plan, do** the criteria include considerations for communities with the highest risk?	Section 5.3.3, p. 5-15	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		
D. **For the new or updated plan, do** the criteria include considerations for repetitive loss properties?	Section 5.3.4, p. 5-15	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		

E. **For the new or updated plan, do** the criteria include considerations for communities with the most intense development pressures?	Section 5.3.5, p. 5-15	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		
		SUMMARY SCORE		

PLAN MAINTENANCE PROCESS

Monitoring, Evaluating, and Updating the Plan ***Requirement §201.4(c)(5)(i):*** *[The Standard State Plan Maintenance Process **must** include an] established method and schedule for monitoring, evaluating, and updating the plan.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan describe the method and schedule for monitoring the plan? (e.g., identifies the party responsible for **monitoring**, includes schedule for reports, site visits, phone calls, and/or meetings)	Sections 6.1.1, 6.1.2, p. 6-1			
B. Does the **new or updated** plan describe the method and schedule for **evaluating** the plan? (e.g., identifies the party responsible for evaluating the plan, includes the criteria used to evaluate the plan)	Section 6.1.3, p. 6-2			
C. Does the **new or updated** plan describe the method and schedule for **updating** the plan?	Section 6.1.4, p. 6-3			
D. Does the updated plan include an analysis of whether the previously approved plan's method and schedule worked, and what elements or processes, if any, were changed?	Section 6.1.5, p. 6-3			
		SUMMARY SCORE		

Monitoring Progress of Mitigation Activities ***Requirement §201.4(c)(5)(ii):*** *[The Standard State Plan Maintenance Process **must** include a] system for monitoring implementation of mitigation measures and project closeouts.* *Requirement **§201.4(c)(5)(iii):** [The Standard State Plan Maintenance Process **must** include a] system for reviewing progress on achieving goals as well as activities and projects in the Mitigation Strategy.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan describe how mitigation measures and project closeouts will be monitored?	Section 6.2.1 & 6.2.2, p. 6-6, 6-7			
B. Does the **new or updated** plan identify a system for reviewing progress on achieving goals in the Mitigation Strategy?	Section 6.2.3, p. 6-7			
C. Does the updated plan describe any modifications, if any, to the system identified in the previously approved plan to track the initiation, status, and completion of mitigation activities?	Section 6.2.4, p. 6-8			
D. Does the **new or updated** plan identify a system for reviewing progress on implementing activities and projects of the Mitigation	Section 6.2.5, p. 6-8			

Strategy?				
E. Does the updated plan discuss if mitigation actions were implemented as planned?	Section 6.2.5, 6-8 to 6-12	*Note: Related to §201.4 (c)(3)(iii)*		
		SUMMARY SCORE		

SEVERE REPETITIVE LOSS STRATEGY *(only required for 90/10 under FMA & SRL)*

Repetitive Loss Mitigation Strategy

Requirement §201.4(c)(3)(v): *A State may request the reduced cost share authorized under §79.4(c)(2) of this chapter for the FMA and SRL programs, if it has an approved State Mitigation Plan … that also identifies specific actions the State has taken to reduce the number of repetitive loss properties (which **must** include severe repetitive loss properties), and specifies how the State intends to reduce the number of such repetitive loss properties.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Does the new or updated plan describe State mitigation goals that support the selection of mitigation activities for repetitive loss properties (see also Part 201.4(c)(3)(i))?	Section 4.6.1, 4.6.2, 4.6.3, 4.6.4, 4.6.5, 4.6.6, p. 4-68 to 4-69; Table 4-2, p. 4-9	***[Note: Only required for SRL 90/10 under FMA & SRL]***		
B. Does the new or updated plan consider repetitive loss properties in its evaluation of the State's hazard management policies, programs, and capabilities and its general description of the local mitigation capabilities (see also Part 201.4(c)(3)(ii))?	Section 4.2.1, p. 4-14, Table 4-3, p. 4-15; Table 4-2, p. 4-9	***[Note: Only required for SRL 90/10 under FMA & SRL]***		
C. Does the new or updated plan address repetitive loss properties in its risk assessment (see also Part 201.4(c)(2))?	Section 3.3.7.3.2, Table 3-16, p. 3-67.	***[Note: Only required for SRL 90/10 under FMA & SRL]***		
D. Does the new or updated plan identify, evaluate and prioritize cost-effective, environmentally sound, and technically feasible mitigation actions for repetitive loss properties (see also Part 201.4(c)(3)(iii))?	Section 5.3.1.1, p. 5-14; Table 4-2, p. 4-9	***[Note: Only required for SRL 90/10 under FMA & SRL]***		
E. Does the new or updated plan describe specific actions that have been implemented to mitigate repetitive loss properties, including actions taken to reduce the number of severe repetitive loss properties?	Section 4.6.5, p. 4-69; Section 3.3.7.3.3 and Appendix P	***[Note: Only required for SRL 90/10 under FMA & SRL]***		
F. Does the new or updated plan identify current and potential sources of Federal, State, local, or private funding to implement mitigation activities for repetitive loss properties (see also Part 201.4(c)(3)(iv))?	Section 4.6.6, p. 4-69; Appendix P	***[Note: Only required for SRL 90/10 under FMA & SRL]***		
		SUMMARY SCORE		

Coordination with Repetitive Loss Jurisdictions

Requirement §201.4(c)(3(v): *In addition, the plan* ***must*** *describe the strategy the State has to ensure that local jurisdictions with severe repetitive loss properties take actions to reduce the number of these properties, including the development of local mitigation plans.*

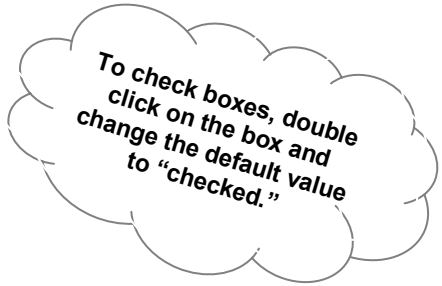
Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan provide a description of the State process to support, through funding and technical assistance, the development of local mitigation plans in communities with severe repetitive loss properties (see also Part 201.4(c)(4)(i))?	Sec. 5.1.1, p. 5-1; Section 4.6.1, p. 4-68; Section 4.6.2, p. 4-68	***[Note: Only required for SRL 90/10 under FMA & SRL]***		
B. Does the new or updated plan include considerations for repetitive loss properties in its criteria for prioritizing communities and local jurisdictions that would receive planning and project grants under available mitigation funding programs (see also Part 201.4(c)(3)(iii))?	Sec. 8.2.1, p.8-6; Fig. 8-1, p. 8-6; Sec. 5.3.4, p. 5-15	***[Note: Only required for SRL 90/10 under FMA & SRL]***		
		SUMMARY SCORE		

Matrix A: Profiling Hazards

This matrix can assist FEMA in scoring each hazard. States may find the matrix useful to ensure that their plan addresses each natural hazard that can affect the State. **Completing the matrix is not required.**

*Note: First, check which hazards are identified in requirement §201.4(c)(2)(i). Then, place a checkmark in either the N or S box for each **applicable** hazard. An "N" for any element of any identified hazard will result in a "Needs Improvement" score for this requirement. List the hazard and its related shortcoming in the comments section of the Plan Review Crosswalk.*

Hazard Type	Hazards Identified Per Requirement §201.4(c)(2)(i)	A. Location		B. Previous Occurrences		C. Probability of Future Events	
	Yes	N	S	N	S	N	S
Avalanche	☐	☐	☐	☐	☐	☐	☐
Coastal Erosion	☐	☐	☐	☐	☐	☐	☐
Coastal Storm	☐	☐	☐	☐	☐	☐	☐
Dam Failure	☐	☐	☐	☐	☐	☐	☐
Drought	☐	☐	☐	☐	☐	☐	☐
Earthquake	☐	☐	☐	☐	☐	☐	☐
Expansive Soils	☐	☐	☐	☐	☐	☐	☐
Extreme Heat	☐	☐	☐	☐	☐	☐	☐
Flood	☐	☐	☐	☐	☐	☐	☐
Hailstorm	☐	☐	☐	☐	☐	☐	☐
Hurricane	☐	☐	☐	☐	☐	☐	☐
Land Subsidence	☐	☐	☐	☐	☐	☐	☐
Landslide	☐	☐	☐	☐	☐	☐	☐
Levee Failure	☐	☐	☐	☐	☐	☐	☐
Severe Winter Storm	☐	☐	☐	☐	☐	☐	☐
Tornado	☐	☐	☐	☐	☐	☐	☐
Tsunami	☐	☐	☐	☐	☐	☐	☐
Volcano	☐	☐	☐	☐	☐	☐	☐
Wildfire	☐	☐	☐	☐	☐	☐	☐
Windstorm	☐	☐	☐	☐	☐	☐	☐
Other _____	☐	☐	☐	☐	☐	☐	☐
Other _____	☐	☐	☐	☐	☐	☐	☐
Other _____	☐	☐	☐	☐	☐	☐	☐

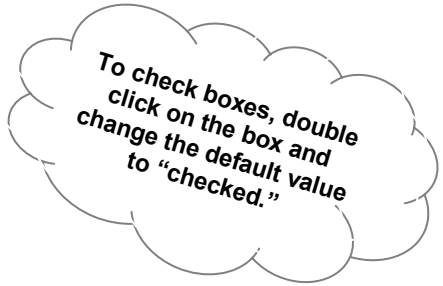


Legend:
§201.4(c)(2)(i) Profiling Hazards
A. Does the risk assessment identify the location (i.e., geographic area affected) of each natural hazard addressed in the **new or updated** plan?
B. Does the plan provide information on previous occurrences of each hazard addressed in the **new or updated** plan?
C. Does the plan include the probability of future events (i.e., chance of occurrence) for each hazard addressed in the **new or updated** plan?

Matrix B: Assessing Vulnerability

This matrix can assist FEMA in scoring each hazard. States may find the matrix useful to ensure that their plan addresses each requirement. Note that this matrix only includes items for Requirements §201.4(c)(2)(ii) and §201.4(c)(2)(iii) that are related to specific natural hazards that can affect the State. **Completing the matrix is not required**.

*Note: First, check which hazards are identified in requirement §201.4(c)(2)(i). Then, place a checkmark in either the N or S box for each **applicable** hazard. An "N" for any element of any identified hazard will result in a "Needs Improvement" score for this requirement. List the hazard and its related shortcoming in the comments section of the Plan Review Crosswalk.*



Hazard Type	Hazards Identified Per Requirement §201.4(c)(2)(i)	§201.4(c)(2)(ii) Assessing Vulnerability					§201.4(c)(2)(iii) Estimating Potential Losses				
		1. Vulnerability by Jurisdiction		2. Vulnerability to State Facilities			3. Loss Estimate by Jurisdiction		4. Loss Estimate of State Facilities		
	Yes	N	S	N	S		N	S	N	S	
Avalanche	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Coastal Erosion	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Coastal Storm	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Dam Failure	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Drought	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Earthquake	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Expansive Soils	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Extreme Heat	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Flood	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Hailstorm	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Hurricane	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Land Subsidence	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Landslide	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Levee Failure	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Severe Winter Storm	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Tornado	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Tsunami	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Volcano	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Wildfire	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Windstorm	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Other _____	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Other _____	☐	☐	☐	☐	☐		☐	☐	☐	☐	
Other _____	☐	☐	☐	☐	☐		☐	☐	☐	☐	

Legend

§201.4(c)(2)(ii) Assessing Vulnerability by Jurisdiction (see element B)

1. Does the **new or updated** plan describe the State's vulnerability in terms of the jurisdictions most threatened and most vulnerable to damage and loss associated with hazard event(s)?

§201.4(c)(2)(ii) Assessing Vulnerability to State Facilities (see element A)

2. Does the **new or updated** plan describe the types of State owned or operated critical facilities located in the identified hazard areas?

§201.4(c)(2)(iii) Estimating Potential Losses by Jurisdiction (see element A)

3. Does the **new or updated** plan present an overview and analysis of the potential losses to the identified vulnerable structures?

§201.4(c)(2)(iii) Estimating Potential Losses of State Facilities (see element A)

4. Does the **new or updated** plan present an estimate of the potential dollar losses to State owned or operated buildings, infrastructure, and critical facilities in the identified hazard areas?

Enhanced State Hazard Mitigation Plan Review and Approval Status

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FEMA Reviewers: National Review Panel	**Title:**	**Date:**
Date Received in FEMA Region [insert #]		
Plan Not Approved		
Date Plan Approved		

ENHANCED STATE HAZARD MITIGATION PLAN SUMMARY CROSSWALK

The plan cannot be approved if the plan has not been formally adopted.

Each requirement includes separate elements. All elements of the requirement must be rated "Satisfactory" in order for the requirement to be fulfilled and receive a score of "Satisfactory." Elements of each requirement are listed on the following pages of the Plan Review Crosswalk. Reviewer's comments must be provided for requirements receiving a **"Needs Improvement"** score.

SCORING SYSTEM
Please check one of the following for each requirement:
N – Needs Improvement: The plan does not meet the minimum for the requirement. Reviewer's comments must be provided.

S – Satisfactory: The plan meets the minimum for the requirement. Reviewer's comments are encouraged, but not required.

Prerequisite	**NOT MET**	**MET**
1. Compliance with Standard State Plan Requirements: §201.5(b)		

Comprehensive State Hazard Mitigation Planning Program	**N**	**S**
2. Integration with Other Planning Initiatives: §201.5(b)(1)		
3. Project Implementation Capability: §201.5(b)(2)(i) and (ii)		
4. Program Management Capability: §201.5(b)(2)(iii A-D)		
5. Assessment of Mitigation Actions: §201.5(b)(2)(iv)		
6. Effective Use of Available Mitigation Funding: §201.5(b)(3)		
7. Commitment to a Comprehensive Mitigation Program: §201.5(b)(4)(i-vi)		

ENHANCED STATE HAZARD MITIGATION PLAN APPROVAL STATUS

PLAN NOT APPROVED	
PLAN APPROVED	

See Reviewer's Comments

PREREQUISITE

1. Compliance with Standard State Plan Requirements

Requirement §201.5(b): *Enhanced State Mitigation Plans* ***must*** *include all elements of the Standard State Mitigation Plan identified in §201.4 … .*

Element	Location in the Plan (section or annex and page #)	National Enhanced Panel Reviewers' Comments	SCORE NOT MET	SCORE MET
A. Does the **new or updated** Enhanced Plan meet all the Standard State Mitigation Plan requirements?	Section 1.2, page 1-1 Appendix A			
		SUMMARY SCORE		

COMPREHENSIVE STATE HAZARD MITIGATION PLANNING PROGRAM

2. Integration with Other Planning Initiatives

Requirement §201.5(b)(1): *[An Enhanced Plan* ***must*** *demonstrate] that the plan is integrated to the extent practicable with other State and/or regional planning initiatives (comprehensive, growth management, economic development, capital improvement, land development, and/or emergency management plans) and FEMA mitigation programs and initiatives that provide guidance to State and regional agencies.*

Element	Location in the Plan (section or annex and page #)	National Enhanced Panel Reviewers' Comments	SCORE N	SCORE S
A. Does the **new or updated** Enhanced Plan demonstrate how it is integrated to the extent practicable with other State and regional planning initiatives (comprehensive, growth management, economic development, capital improvement, land development, and/or emergency management plans)?	Section 8.1.1, pages 8-1 and 8-2 Section 2.3.1, page 2-20 Pages 4-2, 5-9, 5-10			
B. Does the **new or updated** Enhanced Plan demonstrate how it has been integrated to the extent practicable with FEMA mitigation programs and initiatives that provide guidance to State and regional agencies?	Section 8.1.2, page 8-2 and 8-3 Section 2.3.3, page 2-23, Table 2-7 Section 4.2, pages 4-14 to 4-38			

SUMMARY SCORE		

3. Project Implementation Capability

Requirement §201.5(b)(2)(i) and (ii): *[The Enhanced Plan* ***must*** *document] the State's project implementation capability, identifying and demonstrating the ability to implement the plan, including:*

- *Established eligibility criteria for multi-hazard mitigation measures.*
- *A system to determine the cost effectiveness of mitigation measures, consistent with OMB Circular A-94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs, and*
- *[A system] to rank the measures according to the State's eligibility criteria.*

Element	**Location in the Plan** (section or annex and page #)	National Enhanced Panel Reviewers' Comments	SCORE N	SCORE S
A. Does the **new or updated** Enhanced Plan demonstrate that the State has established eligibility criteria for multi-hazard mitigation measures? **Does the updated Plan describe changes, if any, to those criteria?**	Section 8.2.1, pages 8-4 to 8-8-9 and Figures 8-1 and 8-2. Sections 4.2, 5.3			
B. Does the **new or updated** Enhanced Plan describe the State's system for determining the cost effectiveness of mitigation measures, consistent with OMB Circular A-94? **Does the updated Plan describe changes, if any, to this system?**	Section 8.2.2, pages 8-9, Figures 8-1 and 8-2. Section 4.4, Table 4-10. Section 5.3, pages 5-14			

C. Does the **new or updated** Enhanced Plan describe the State's system to rank the measures according to the State's eligibility criteria, **including a process to prioritize projects between jurisdictions and between proposals that address different or multiple hazards**?	Section 8.2.3, pages 8-9 to 8-11 Section 4.4			
		SUMMARY SCORE		

4. Program Management Capability

Requirement §201.5(b)(2)(iii A-D): *[The Enhanced Plan* ***must*** *demonstrate] that the State has the capability to effectively manage the HMGP as well as other mitigation grant programs, [and provide] a record of the following:*

- *Meeting HMGP and other mitigation grant application timeframes and submitting complete, technically feasible, and eligible project applications with appropriate supporting documentation;*
- *Preparing and submitting accurate environmental reviews and benefit-cost analyses;*
- *Submitting complete and accurate quarterly progress and financial reports on time; and*
- *Completing HMGP and other mitigation grant projects within established performance periods, including financial reconciliation.*

Element	**Location in the Plan** (section or annex and page #)	National Enhanced Panel Reviewers' Comments	SCORE N	SCORE S
A. Does the **new or updated** Enhanced Plan describe the State's capability to effectively manage the HMGP as well as other mitigation grant programs?	Sec. 8.3.1, page 8-11. Fig. 8-3, pages 8-12	Correspondence from the Region will be provided to the State on a regular basis regarding grant management performance regarding all elements in this section.		
B. Does the **new or updated** Enhanced Plan provide a record for meeting HMGP and other mitigation grant application timeframes and submitting complete, technically feasible, and eligible project applications with appropriate supporting documentation?	Sec. 8.3.1, pages 8-11 to 8-16; Fig. 8-4, pages 8-14.	See above		
C. Does the **new or updated** Enhanced Plan provide a record for preparing and submitting accurate environmental reviews and benefit-cost analyses?	Sec. 8.3.2, pages 8-14.	See above		
D. Does the **new or updated** Enhanced Plan provide a record for submitting complete and accurate quarterly progress and financial reports on time?	Sec. 8.3.3, pages 8-15; Fig. 6-2, pages 6-9 and 6-10.	See above		
E. Does the **new or updated** Enhanced Plan provide a record for completing HMGP and other mitigation grant projects within established performance periods, including financial reconciliation?	Sec. 8.3.4, pages 8-15-6; Fig. 6-2, pages 6-9 and 6-10.	See above		
		SUMMARY SCORE		

5. Assessment of Mitigation Actions

Requirement §201.5(b)(2)(iv): *[The Enhanced Plan **must** document the] system and strategy by which the State will conduct an assessment of the completed mitigation actions and include a record of the effectiveness (actual cost avoidance) of each mitigation action.*

Element	Location in the Plan (section or annex and page #)	National Enhanced Panel Reviewers' Comments	SCORE N	SCORE S
A. Does the **new or updated** Enhanced Plan describe the system and strategy by which the State will conduct an assessment of the completed mitigation actions?	Section 8.4.1, page 8-17.			
B. Does the **new or updated** Enhanced Plan include the record of the effectiveness (i.e., actual cost avoidance) of each mitigation actions, **including how the assessment was completed?**	Section 8.4.1, page 8-17. Section 8.4.2, pages 8-17 to 8-21, Table 8-1			
		SUMMARY SCORE		

6. Effective Use of Available Mitigation Funding

Requirement §201.5(b)(3): *[The Enhanced Plan **must** demonstrate] that the State effectively uses existing mitigation programs to achieve its mitigation goals.*

Element	Location in the Plan (section or annex and page #)	National Enhanced Panel Reviewers' Comments	SCORE N	SCORE S
A. Does the new or updated Enhanced Plan document how the State has made full use of funding available from FEMA mitigation grant programs, and if the State has not made full use of this funding, does the plan explain the reasons why?	Section 8.5.1, page 8-21 Section 8.5.2, page 8-23 to 8-26, Table 8-3 Section 4.2.4, pages 4-31 Section 5.1 Section 8.3.1, page 8-12 Section 8.5.1, pages 8-21 to 8-23			

B. Does the **new or updated** Enhanced Plan document how the State is effectively using existing programs to achieve its mitigation goals?	Section 8.5.2, pages 8-23 to 8-26, Table 8-2 Section 4.2.1, page 4-14; Table 4-3, page 4-15 to 4-30 Section 4.5, Tables 4-11 and 4-12, pages 4-65 and 4-66			
			SUMMARY SCORE	

7. Commitment to a Comprehensive Mitigation Program

Requirement §201.5(b)(4)(i-vi): *[The Enhanced Plan **must** demonstrate] that the State is committed to a comprehensive state mitigation program, which might include any of the following:*

- *A commitment to support local mitigation planning by providing workshops and training, State planning grants, or coordinated capability development of local officials, including Emergency Management and Floodplain Management certifications.*
- *A Statewide program of hazard mitigation through the development of legislative initiatives, mitigation councils, formation of public/private partnerships, and/or other executive actions that promote hazard mitigation.*
- *The State provides a portion of the non-Federal match for HMGP and/or other mitigation projects.*
- *To the extent allowed by State Law, the State requires or encourages local governments to use a current version of a nationally applicable model building code or standard that addresses natural hazards as a basis for design and construction of State sponsored mitigation projects.*
- *A comprehensive, multi-year plan to mitigate the risks posed to the existing buildings that have been identified as necessary for post-disaster response and recovery operations.*
- *A comprehensive description of how the State integrates mitigation into its post-disaster recovery operations.*

Element	**Location in the Plan** (section or annex and page #)	**National Enhanced Panel Reviewers' Comments**	**SCORE** N	S
A. Does the **new or updated** Enhanced Plan demonstrate that the State is committed to a comprehensive State mitigation program?	Section 8.6, pages 8-27 to 8-36 Section 5.1.2			

B. Does the updated Enhanced Plan demonstrate progress in implementing a comprehensive State mitigation program, including new mitigation initiatives developed or implemented by the State?	Section 8.6, pages 8-27 to 8-36 Section 2.3, page 2-20 Section 4.2.1, page 4-14, Table 4-3 Section 4.2.4, pages 4-31 to 4-32 Section 4.5, pages 4-65 and 4-66, Tables 4-11 and 4-12			
			SUMMARY SCORE	

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	Use amounts 1-5 (1 being the lowest rating) to rate each category (i.e. Community Acceptance) for each action. I will be using the Priority Totals from all respondents to prioritize the actions.	(Social)		(Technical)			(Administrative)			(Political)			(Legal)			(Economic)				(Environmental)					
Considerations ⇒ / Mitigation Actions ⇩		Community Acceptance	Effect on Segment of Population	Technical Feasibility	Long-term Solution	Secondary Impacts	Staffing	Funding Allocated	Maintenance/ Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/ Water	Effect on Endangered Species	Effect on HAZMAT/Waste Sites	Consistent with Native Habitat	Consistent with Local / Federal Laws	Priority Total
Goal 1: Reduce the loss of life and injuries																									
1.A	Improve awareness of the locations, potential impacts and links among hazards, vulnerability and measures to protect life safety and health																								**0**
1.B	Provide current information about hazards, vulnerabilities, mitigation processes and technical assistance for planning and grant availability and application procedures to State and local agencies																								**0**
1.C	Encourage the incorporation of mitigation measures into repairs, major alterations, new development and redevelopment practices																								**0**

	1.D	Promote the modification of structures to meet life safety standards								**0**
	1.E	Improve communication, collaboration and integration among stakeholders and promote hazard mitigation as an integrated public policy								**0**
	1.F	Encourage local governments, special districts and tribal organizations to develop, adopt and implement, maintain and update hazard mitigation plans								**0**
	1.G	Develop a hazard communication system that can be used to rapidly detect and provide early warning for multiple hazards, including earthquakes and wildfires								**0**
	2.A	Provide technical assistance, guidance, resources and tools to local governments and tribal entities to promote hazard mitigation planning								**0**
Goal 2: Improve Local Hazard Mitigation Plans & Technical Assistance	2.B	Provide specialized training and exercises to state agency staff and local governments concerning local hazard mitigation planning and the local hazard mitigation plan program								**0**

2.C	Maintain a tracking system for local and state government mitigation plans and projects								**0**
2.D	Provide training to local governments and state agency staff to clarify mitigation measures from response and recovery and preparedness measures								**0**
2.E	Maintain a system to allow state agencies with hazard mitigation programs and plans to make recommendations about how local governments can incorporate these in support of the state's mitigation program efforts								**0**
2.F	Continue to build operational links between hazard mitigation, disaster preparedness and recovery programs with public and private sectors								**0**
2.G	Promote understanding by the general public of the benefits of hazard mitigation in reducing casualty and property losses and ensuring continuity of businesses, institutional and government functions								**0**

	2.H	Promote coordiantion among state agencies, local governments and tribal organizations of regional hazard mitigation activities								**0**
	2.I	Identify, enhance and integrate public education efforts by state and local agencies that have programs directed to hazard mitigation								**0**
	3.A	Protect existing assets, as well as future development, from the effects of earthquakes by providing setback criteria for building and development								**0**
Goal 3: Reduce the possibility of damage and losses due to earthquakes NBMG, NV Seismology Laboratory (NSL), Nevada Earthquake	3.B	Hold workshop on strategies, benefits, risk-reduction opportunities, and challenges associated with the inventory of seismically susceptible								**0**
	3.C	Assist communities and State to retrofit, change occupancy to decrease risk, or demolish susceptible buildings and structures								**0**
	3.D	Create planning for "special consideration zones" for Nevada communities								**0**
	3.E	Create microzonation of earthquake hazards in Nevada								**0**

3.F	Encourage seismic retrofit of deficient essential structures and infrastructure of community and State critical facilities (economic and lifeline-utilities) to structurally and seismically withstand the effects of earthquakes.								**0**
3.G	Encourage seismic retrofit of public safety and critical facilities (both community and State) (such as 911 communications, hospitals, fire, law enforcement and ambulance facilities, etc.)								**0**
3.H	Develop lesson plans or activities for teachers to increase awareness about Nevada's earthquake hazard that tie into the existing science curriculum and align with the science standards for the state.								**0**
3.I	Increase media involvement by networking with partners from all media types such as print, radio, TV, and social media.								**0**
3.J	Provide Applied Technology Council (ATC) training and develop formalization of the process								**0**

3.K	Expand earthquake awareness in educational sites such as regional science fairs, and speakers								0
3.L	Develop earthquake hazard information programs targeting public safety, emergency managers, local government executives, and business and industry.								0
3.M	Promote the Great Nevada Shakeout and earthquake drills throughout the state.								0
3.N	Promote training of volunteer community emergency response teams (CERT) about earthquake risks and possible mitigation activities.								0
3.O	Promote training of hospital staff about earthquake risks and possible mitigation activities.								0
3.P	Improve integration of the emergency management system at all levels of the community bringing forth the “whole community” approach.								0
3.Q	Provide publications and workshops to promote the exchange of technical information relating to earthquakes among professionals, managers and the citizens of Nevada.								0

3.R	Promote a post-earthquake technical clearinghouse through planning and established practices.								0
3.S	Give planning and special consideration to developing a “Fault Map of Nevada” and identifying all active faults and seismic sources near major urban areas in Nevada.								0
3.T	Establish a “lifelines and transportation” workgroup.								0
3.U	Enhance implementation of nonstructural remediation.								0
3.V	Create earthquake planning scenarios (Las Vegas and rural areas).								0
3.W	Determine potential fault rupture characteristics and maximum earthquakes.								0
3.X	Continue to inventory and field-verify unreinforced masonry buildings in Nevada and make this data publicly available to planners and emergency response staff in communities statewide.								0
3.Y	Promote coordination among private and public entities to improve statewide earthquake monitoring capabilities.								0

	3.Z	Identify potential funding sources for earthquake mitigation strategic actions not only at the Federal and State levels but also from private funding and community partnerships.								**0**
	3.AA	Develop a set of model codes and regulations that would be presented after a major earthquake occurs in Nevada.								**0**
	4.A	Protect existing assets, as well as future development, from the effects of flooding								**0**
Goal 4: Reduce the possibility of damage and losses due to flooding Div. of Water Resources,	4.B	Identify and prioritize areas in the State where existing flood hazard mapping is inadequate due to planned and existing significant development and conduct flood hazard mapping in those areas								**0**
	4.C	Conduct flood hazard mapping in piedmont and alluvial fan environments								**0**
	4.D	Retrofit State buildings to meet NFIP standards								**0**
	4.E	Assist communities and State with programs to elevate, dry-flood proof or wet-flood proof identified structures to obtain NFIP compliance and/or mitigate repetitive loss structures								**0**

4.F	Assist communities and State with programs to acquire and demolish or relocate repetitive loss structures								**0**
4.G	Upgrade State owned or operated infrastructure (e.g. servicing roads, culverts, bridges, channels, and structures) related to State owned or operated critical facilities to protect critical facilities from flood damages or disruption of essential services								**0**
4.H	Protect existing assets as well as future development from the effects of dam failure								**0**
4.I	Inventory existing dams and add to the inventory as dams are discovered or constructed.								**0**
4.J	Inventory and inspect existing dams for structural and hydraulic adequacy and implement operational constraints, if warranted.								**0**
4.K	Install early warning weather stations in watersheds with dams above populated areas								**0**
4.L	Assist communities and State in structural mitigation measures, updates, and repairs to dams								**0**

	4.M	Encourage local ordinances and regulations to reduce encroachment into flood prone zones resulting from dam impoundment or high (non-failure) releases.								**0**
	4.N	Identify hazards of flooding from man-made structures, such as irrigation ditches and canals, and integrate these into local zoning ordinances								**0**
	4.O	Develop laws and regulations that ensure reasonable standards of design and construction to reduce flood hazards								**0**
	4.P	Develop Emergency Action Plans to ensure swift coordinated response in the event of an emergency								**0**
Goal 5: Reduce the possibility of damage and	5.A	Protect existing assets, as well as future development, from the effects of wildfire								**0**
	5.B	Identify and recommend changes to State NRS, NAC and communities ordinances and regulations								**0**
	5.C	Assist local communities in enacting local ordinances for mitigation and fire prevention								**0**

5.D	Provide public education and outreach to educate homeowners in the Wildland Urban Interface (WUI) about proper defensible space practices and landscaping for fire resistance and encourage community involvement in project completion, participation, and maintenance								**0**
5.E	In highly motivated communities, focus on activities by individual participation in and maintenance of projects (personal responsibility)								**0**
5.F	Educate and train State and communities in current standards and regulations for proper practices in defensible space and firefighting								**0**
5.G	Ensure proper personal protective equipment, apparatus, equipment and training for career staff and seasonal wildland firefighters.								**0**
5.H	Assist volunteer fire departments in attaining funds for proper personal protective equipment, apparatus, equipment and training								**0**

5.I	Participate in research and development of interoperability for emergency response communications								0
5.J	Coordinate the development of a comprehensive, collaborative program for mutual aid/mobilization of state and local government fire resources								0
5.K	Encourage collaboration on all levels among state, federal and local cooperators, both fire- and resource-related								0
5.L	Continue to improve fire prevention programs statewide through partnerships with Fire Prevention Association of Nevada, State Fire Marshals Office, University of Nevada, Reno Cooperative Extension, and any other cooperators.								0
5.M	Assist communities in fuels reduction projects for areas with extreme or high ratings in Community Wildfire Protections Plan (CWPP) assessments								0

5.N	Provide funding and service forestry technical assistance through the State Fire Assistance and Hazardous Fuels Reduction programs to reduce fuels on state and private property								0
5.O	Provide assistance to counties for priority setting and CWPP updating								0
5.P	Provide a statewide evaluation process for monitoring community progress, prioritization and participation in CWPP								0
5.Q	Provide and maintain a statewide process for documenting fuels projects progress, completion, success and maintenance								0
5.R	Focus projects in areas to attain desired forest conditions and coordinate with forest health program activities								0
5.S	Ensure that all projects have an approved fuels/forest health/stewardship plan that includes all aspects of service forestry (State Historic Preservation Officer (SHPO) (threatened and endangered species, prescriptions, actions, etc.)								0

5.T	Provide training for employees and project managers on SHPO and cultural resource identification, reporting methods and clearances								0
5.U	Work closely with the Tribal communities, local landowners, and the SHPO to obtain clearances and to mark sensitive sites								0
5.V	Provide assistance to communities and State in planning and implementing long-term sustainable landscape projects								0
5.W	Restore native and adapted vegetation and work to prevent areas being impacted by non-native or undesirable species conversions through collaborative								0
5.Y	Use mechanical and hand treatments as well as prescribed fire to assist in attaining desired forest and rangeland conditions								0
5.Z	Provide native and accepted introduced seed species through the Nevada State Seedbank program								0
5.AA	Provide training for local cooperators for treatment practices and skill acquisition								0

5.AB	Encourage collaboration at all levels with state, federal and local cooperators								**0**
5.AC	Assist communities and State in Burned Area Emergency Rehabilitation, and complete fire damage reclamation reports and public education and outreach to provide the best land management practices available for collaborative land rehabilitation								**0**
5.AD	Assess damage to critical watershed and threats to communities' domestic water supplies and mitigate those threats through erosion control practices								**0**
5.AE	Supply resources for rehabilitation efforts through the State Tree Nurseries in Las Vegas and Washoe Valley, and the Nevada State Seedbank programs.								**0**
5.AF	Provide training, expertise, and supplies/equipment in a collaborative manner to assist in rehabilitation								**0**
5.AG	Provide public education and outreach to communities affected by wildfire								**0**

5.AH	Focus fuels projects in communities with extreme or high ratings in CWPP assessments								0
5.AI	Assist with the development of and the participation in a comprehensive program by which current CWPP or equivalent assessments are updated as projects are completed, ratings change or new at-risk communities arise.								0
5.AJ	Assist in the formulation and dissemination of current information such as Living with Fire documents								0
5.AK	Encourage community involvement in project completion, participation, and maintenance								0
5.AL	Assist, encourage and provide guidance to communities in the development of the appropriate fire service organization for their community (i.e. a legally constituted fire protection district or fire department) according to NRS 472.040								0

5.AM	Assist in acquiring funding for local firefighters for training and equipment through the State Fire Assistance, and Volunteer Fire Assistance when funded by US Forest Service								**0**
5.AN	Assist in the planning for and removal of biomass waste on fuels reduction and forest health projects, as well as following wildland fires, flooding and other catastrophic natural event								**0**
5.AO	Comply with all federal regulations in the funding stream to ensure compliance and future competitiveness								**0**
5.AP	Keep apprised of all federal, state, and local regulations								**0**
5.AQ	Participate in interagency project planning, implementation and monitoring								**0**
5.AR	Protect the envelop of buildings from wildfire								**0**