UMATILLA COUNTY

NATURAL HAZARDS MITIGATION PLAN 2009

Umatilla County
Natural Hazards
Mitigation Plan

Report for:
Umatilla County, Oregon

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LIST OF ADDENDUMS

Note: Addendums intentionally left blank until HMP addendums completed for each incorporated city and/or the Steering Committee amends the 2006 Plan through the 5-year review

ADDENDUM 1:

ADDENDUM 2:

ADDENDUM 3:

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Chapter 1. PLANNING PROCESS

Introduction

The Umatilla County Natural Hazards Mitigation Plan (Mitigation Plan) includes resources and information to help assist the residents of the incorporated and unincorporated areas, public and private sector organizations and others interested in participating in planning for natural hazards.

Umatilla County, Oregon has an area of 3,231 square miles and a population of 70, 548,[1] two-thirds of whom are residents of one of the County's twelve incorporated areas. The purpose of this plan is to ensure a coordinated, integrated response with maximum use of all resources to mitigate the effects of any natural disaster impacting Umatilla County. This plan specifies, to the extent possible, the core actions to be taken by Umatilla County, municipalities and cooperating private institutions to respond to a disaster situation. The plan is designed around two of the four phases of Emergency Management[2]: Planning (Preparedness) and Mitigation. This plan was written to identify means to prevent disasters, if possible, (Planning); and to reduce the vulnerability to disasters and establish capabilities for protecting the public from the effect of disasters (Mitigation).

1.01 Planning Participation

The Mitigation Plan is the result of a coordinated effort between the private sector and state and local government entities. The Mitigation Plan provides the information and process required by 44 CFR 201.6 to obtain FEMA approval.

Mitigation Plan Steering Committee

The Mitigation Plan Steering Committee is comprised of 7 members representing various agencies and interests in Umatilla County. The Steering Committee's role is to develop the Mitigation Plan mission, goals and actions items.

Steering Committee Members:

- Jim Stearns, Chief, Hermiston Fire and EMS
- John Buckman and David King, Oregon Department of Forestry
- Les Miller, US Army Corps of Engineers
- John Standley, Public Member, Pilot Rock, Oregon

[1] U.S. Census 2000, nighttime residential population.

[2] The four phases of Emergency Management (Planning, Mitigation, Response and Recovery) are addressed and implemented in the Umatilla County Emergency Operations Plan, adopted on December 17, 2003.

- Dennis Hull, NOAA, Warning Meterologist
- John Robertson, Retired, Umatilla National Forest
- Tom Straughan, Oregon Department of Agriculture

1.02 Multi-Jurisdictional Planning Effort


June 17, 2004 Multi-uurisdictional Mapping Workshop

Umatilla County is dedicated to taking a regional approach to planning for natural hazards. Umatilla County has made the effort to include each incorporated city willing to participate in the planning process by making public presentations at City Council meetings, inviting each city to provide a member to the Mitigation Plan Advisory Committee and inviting each city to a hazard/resource mapping workshop and mitigation action item brainstorming session (see Appendix F) for agendas, participation and work products of the multi-jurisdictional effort). Each city that participated in the Multi-Jurisdictional effort has generated large maps identifying critical facilities, infrastructure and hazard prone areas. These maps will be incorporated into each city's addendum to this Mitigation Plan and are currently housed at the Umatilla County Justice Center.

To advance the multi-jurisdictional effort Umatilla County has utilized funds made available by a Region 5 Pre-Disaster Mitigation Planning grant to retain a consultant to work with each incorporated city to create and implement an addendum to co-adopt the Mitigation Plan. Umatilla County Planning and Emergency Management staff have been coordinating with the consultant to assure that the County Mitigation Plan compliments the city plans.

In addition to direct communication with other jurisdictions within Umatilla County, the Planning Office and Emergency Management Division sent Mitigation Plan surveys to each City, as well as stakeholders and the general public, as to increase public involvement in the planning process.

UMATILLA COUNTY CITIES

City of Adams	City of Hermiston	City of Stanfield
City of Athena	City of Milton-Freewater	City of Umatilla
City of Echo	City of Pendleton	City of Ukiah
City of Helix	City of Pilot Rock	City of Weston

Table 1-1: Umatilla County Cities

Umatilla County has also been informally coordinating with the contractors completing the Hazard Mitigation Plan for the Confederated Tribes of the Umatilla Indian Reservation (CTUIR). This is due to the fact that mitigation activities either on or off of the Umatilla Indian Reservation could directly or indirectly impact disaster resistance and resilience for both Umatilla County and the CTUIR.

1.03 Planning Process

The Office of Emergency Management and Planning Divisions of the Umatilla County Department of Resource Services and Development have facilitated the planning process. County staff also utilized the expertise of the University of Oregon, Oregon Natural Hazards Workgroup (ONHW). Staff attended two different trainings sponsored by the ONHW and consulted web sites and other resources developed by the ONHW.

1.04 Mission

To prevent loss and protect life, property and the environment from the risk of natural hazards through coordination and cooperation among public and private partners[3]

1.05 Plan Goals

The plan goals of the Mitigation Plan are broad statements to help focus future mitigation efforts. Plan goals act as a bridge between the overall mission of the Mitigation Plan and the specific action items identified to reduce Umatilla County's risk from eight identified hazards (wildfire, flood, severe winter storms, severe summer storms, earthquake, volcano, landslide/debris flow and drought).

The plan goals were created through staff research of other mitigation plans, as well as input from stakeholders and the Mitigation Plan Steering Committee. The six goals of the Mitigation Plan include:

Goal #1: Protect Life and Property

Goal #2: Public Outreach

[3] Umatilla County Mitigation Plan Steering Committee, March 8, 2004

Goal #3: Planned Prevention

Goal #4: Agency/Citizen Coordination

Goal #5: Natural Resource Protection

Goal #6: Emergency Service Planning

1.06 Plan Facilitation

Coordinating Body
Two divisions (Planning and Office of Emergency Management) of the Umatilla County Department of Resource Services and Development have coordinated the Mitigation Plan planning process and will continue to coordinate and implement the Mitigation Plan.

Convener
A representative from the Umatilla County Resource Services and Development Department will serve as convener to facilitate the Steering Committee meetings, and will assign tasks such as updating and presenting the Mitigation Plan to the members of the Steering Committee, as well as the Planning Commission, Umatilla County Board of Commissioners and other coordinating partners. Plan implementation and evaluation will be a shared responsibility among all of the organizations identified as coordinators or partners in the action item matrix.

1.07 Plan Adoption and Implementation

Plan Adoption
Each participating governing body has the authority to promote sound public policy regarding natural hazards. The Umatilla County Board of Commissioners will be responsible for adopting, by county resolution, the Multi-Jurisdictional Mitigation Plan. The formal review and adoption process is as follows:

1. Umatilla County adopts and submits a final Mitigation Plan draft to OEM State Mitigation Officer for review
2. OEM completes state review and forwards the Mitigation Plan to FEMA for review
3. FEMA reviews and approves/remands Mitigation Plan
4. Once approved by FEMA the Umatilla County Board of Commissioners adopts City Addenda to Mitigation Plan
5. Umatilla County and participating cities gain eligibility for Hazard Mitigation Grant Program funds

In addition to approval and adoption of the county wide Mitigation Plan, each participating incorporated city will be responsible for co-adopting the Mitigation Plan including City Addendums.

Implementation

Land Use Programs

Oregon Statewide Planning Goal 7 requires local governments to mitigate development in known areas of natural disasters and hazards. Umatilla County addresses statewide planning goals and legislative requirements through the Umatilla County Comprehensive Plan. Therefore, the Mitigation Plan will provide a series of recommendations that could influence existing goals, objectives and regulations of the Umatilla County Comprehensive plan and Umatilla County Development Ordinance. Examples of possible updates may include but not be limited to the following:

1. Updates to the findings and policies of the Goal 7 chapter of the Umatilla County Comprehensive Plan
2. Updates to the findings and policies of the Goal 5 and Goal 6 (natural resource quality and quantity) chapters of the Umatilla County Comprehensive Plan.
3. Updates to the Flood Hazard Overlay Zone
4. Updates to the Steep Slope Overlay Zone
5. Updates to both resource zoned and non-resource zoned fire-siting standards

State Administered Programs

Umatilla County does not currently administer a sanitation or building codes program. Those responsibilities fall under the jurisdiction of the State of Oregon. Umatilla County will use the Mitigation Plan to recommend updates to state regulatory policies implemented in Umatilla County, as well as guide local management decisions should the county choose to assume one or more programs currently administered by the State of Oregon

Umatilla County Emergency Management

Umatilla County currently has an approved Emergency Operations Plan that deals with mitigation and response of both manmade and natural disasters. The Mitigation Plan may recommend amendments to the existing policies of the Emergency Operations Plan. The amendments may be directly associated with natural hazard response and responsibility.

Stakeholders

The Mitigation Plan process has identified multiple private and public agencies that can benefit from pre-disaster mitigation funding, planning and projects. The planning process has utilized the expertise of stakeholders to identify projects

and planning not directly related too or under the jurisdiction of Umatilla County, but that could benefit the quality of life and safety of Umatilla County residents. Therefore, the Mitigation Plan will recommend on the ground and planning projects from other entities and jurisdictions that will benefit the overall disaster resistance and resilience of Umatilla County.

1.08 Monitoring, Evaluating and Updating the Plan

Formal Review Process

The Umatilla County Mitigation Plan will be evaluated on an annual basis to determine opportunities for making the Mitigation Plan more effective and to reflect changes that may effect mitigation and planning priorities. The Umatilla County Department of Resource Services & Development, as convener, will be responsible for contacting the Mitigation Plan Steering Committee members to organize an evaluation meeting.

Steering Committee members will be responsible for monitoring and evaluating the goals, action items and mitigation priorities of the Mitigation Plan to determine their relevance to changing situations in Umatilla County, as well as changes in State and Federal policy, to ensure that the plan is addressing current and expected conditions. The Steering Committee will also review the risk assessment portion of the Mitigation Plan to determine if information should be updated or modified, given any new or additional data. In addition to formal review by the Steering Committee, organizations responsible for the various action items implemented through the Mitigation Plan will also have the opportunity to report on the status of their projects and which mitigation strategies should be revised.

The Umatilla County Department of Resource Services & Development will update the Mitigation Plan every five years. Resource Services & Development will also coordinate with all holders of the Mitigation Plan when changes have been made. Every five years the updated plan will be submitted to the Oregon State Mitigation Officer and FEMA for review.

City Addenda

Umatilla County estimates that all participating city jurisdictions will have adopted addenda by the fall of 2009. Following adoption of addenda by all cities, the convener will facilitate a Steering Committee to review and recommend incorporating the addenda into the County Mitigation Plan. Following the Steering Committee meeting, all addenda will be forwarded to the Umatilla County Board of Commissioners for formal adoption as part of the Mitigation Plan. It is estimated that formal adoption of all addenda will take place in the fall/winter of 2009.

Annual Meeting

The steering committee will meet annually to review updates of the Risk Assessment data and findings, discuss methods of continued public involvement, and document successes and lessons learned based on actions that were accomplished during the past year. The convener will be responsible for documenting the outcomes of the annual.

The plan's format allows the County to review and update sections when new data becomes available. New data can be easily incorporated, resulting in a natural hazards mitigation plan that remains current and relevant to Umatilla County and participating jurisdictions.

The first annual meeting of the Steering Committee will take place after all participating cities have adopted addenda to the Umatilla County Plan. It is anticipated that the first annual meeting will take place in the fall of 2009, with future roughly one year from the date of the first meeting.

Five-Year Review of Plan

This plan will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. During this plan update, the following questions should be asked to determine what actions are necessary to update the plan. The convener will be responsible for convening the Committee to address the questions outlined below.

- Are the plan goals still applicable?
- Do the plan's priorities align with State priorities?
- Are there new partners that should be brought to the table?
- Are there new local, regional, state, or federal policies influencing natural hazards that should be addressed?
- Has the community successfully implemented any mitigation activities since the plan was last updated?
- Have new issues or problems related to hazards been identified in the community?
- Do existing actions need to be reprioritized for implementation?
- Are the actions still appropriate given current resources?
- Have there been any changes in development patterns that could influence the effects of hazards?
- Have there been any significant changes in the community's demographics that could influence the effects of hazards?
- Are there new studies or data available that would enhance the risk assessment?
- Has the community been affected by any disasters? Did the plan accurately address the impacts of this event?

The questions above will help the committee determine what components of the mitigation plan need updating. The Committee will be responsible for updating any deficiencies found in the plan based on the questions above.

The first 5-year review of the Mitigation Plan will take place, approximately five years from the date of adoption (summer of 2014).

Continued Public Involvement

Umatilla County has taken great strides to involve the general public throughout the planning process of the Mitigation Plan, and is dedicated to involving the public directly in review and updates of the Mitigation Plan. The Steering Committee is responsible for participating in the annual review of the Mitigation Plan and stakeholder members, including agency and city representatives will be encouraged to participate either directly or through additional surveys and public presentations.

A public meeting will be held for each annual evaluation of the Mitigation Plan. The meetings will provide a public forum for expressing concerns, opinions or ideas about the Mitigation Plan. The Umatilla County Department of Resource Services & Development will be responsible for publicizing the public meetings and maintaining public involvement.

1.09 Mitigation Strategies

Mitigation Plan Action Items

The Mitigation Plan identifies action items developed through data collection and research, stakeholder questionnaires and the public participation process (i.e. meetings and workshops). Mitigation plan activities may be considered for funding through federal and state grant programs, and when other funds are made available through the county or participating organization. Action items in the Mitigation Plan address hazard specific issues, as well as multi-hazard issues that could mitigate for several hazards. To help ensure activity implementation, each action item includes information on the timeline, coordinating organizations and partner organizations. Upon implementation, the coordinating organizations may look to partner organizations for resources and technical assistance. The following areas are specifically addressed with each identified action item:

1. Coordinating Organization: The coordinating organization is the entity that is willing and able to organize resources, find appropriate funding streams, and oversee activity implementation, monitoring and evaluation. Coordinating organizations may include local, county, state or regional agencies that are capable of or responsible for implementing activities and programs.

2. Partner Organization: Partner organizations are the local, county, state, regional and/or federal entities capable of providing technical and/or resource assistance to activities and programs. Partner organizations are not responsible for direct implementation and evaluation but are vitally important to ensuring a comprehensive Mitigation Plan.

3. Timeline: Each action item includes an estimate of the timeline for implementation.

4. Ideas for Implementation: Each action item includes ideas for implementation and potential resources, which may include funding streams and human resources.

5. Plan Goals Addressed: The plan goals addressed by each action item are included as a way to monitor and evaluate how well the mitigation plan meets the plan goals once implementation begins. By addressing plan goals in each mitigation strategy, coordinating and partner organizations are more capable of maximizing Mitigation Plan efficiency.

Action Item Prioritization

Establishing and implementing a project prioritization process is important because it: (1) is a required element of the Disaster Mitigation Act of 2000, (2) can assist the Steering Committee make decisions about how to move forward and (3) can assist in directing the effective use of limited mitigation dollars. The following prioritization process was developed by the Oregon Natural Hazard Workgroup at the University of Oregon's Community Service Center. The four step process described below results in a priority score of high, medium, or low for each action. The priority scores are based on the following three factors:

1. the risk assessment;

2. the availability of funding; and

3. a cost benefit analysis.

This methodology will be used by the steering committee to initially prioritize the plan's action items during the development of the plan and will also be used to update the action items during the plan's annual review and update.

Potential mitigation activities will often come from a variety of sources; therefore project prioritization process needs to be flexible. Mitigation actions may be identified by Committee members, local government staff, other planning documents, or the Risk Assessment. Depending on the potential project's intent and implementation methods, several funding sources may be appropriate. Examples of mitigation funding sources include, but are not limited to: FEMA's Pre-Disaster Mitigation competitive grant program (PDM), Flood Mitigation

Assistance (FMA) program, National Fire Plan (NFP), Title II funds, Title III funds, Community Development Block Grants (CDBG), local general funds, and private foundations, among other

The Mitigation Plan Steering Committee has prioritized the Action Items for each identified hazard. The prioritization of Action Items assures the greatest opportunity of providing mitigation success and achieving plan goals.

Although prioritizing Action Items provides a guide to Umatilla County Mitigation Plan implementation, Umatilla County has the option to implement any of the action items at any time. This option to consider all Action Items for implementation allows Umatilla County to consider mitigation strategies as new situations arise, such as capitalizing on funding resources that could pertain to an Action Item that would be successful but that is not necessarily the highest priority in the Mitigation Plan.

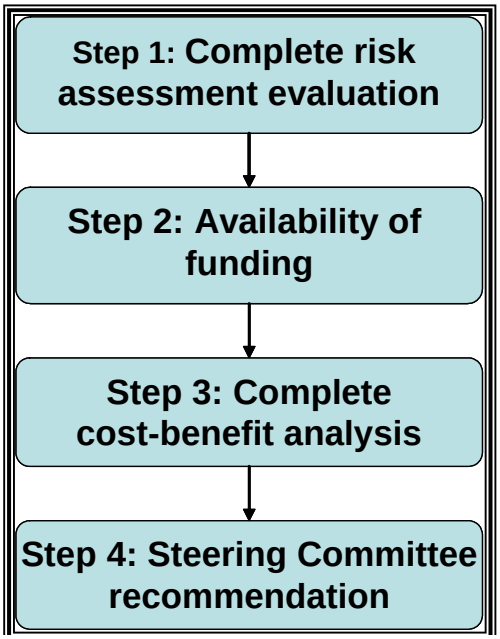

Figure A: Project Prioritization Process Overview (Source: ONHW/CPW, 2005)

Economic Analysis of Mitigation Projects

The Federal Emergency Management Agency's accepted methods for determining the costs and benefits associated with natural hazard mitigation strategies, measures or projects falls into two general categories: benefit/cost analysis and cost-effectiveness analysis (See Appendix G, created by the University of Oregon, for a complete breakdown of the Economic Analysis processes). Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster related damages later. Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating natural hazards can provide decision makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

Given federal funding, Umatilla County will use a FEMA approved benefit/cost analysis approach to identify and prioritize mitigation action items. For other projects and funding sources, Umatilla County may use other approaches including the STAPLE/E approach[4] to understand the costs and benefits of each action item and develop a prioritized list.

Based on funding and extent of mitigation, the higher priority mitigation activities would be selected from this prioritized list. Using cost/benefit analysis is a primary decision making tool and will aid Umatilla County in selecting the best possible mitigation strategies in the future.

[4] "Economic Analysis of Natural Hazard Mitigation Projects," Community Service Center's Oregon Natural Hazards Workgroup at the University of Oregon.

Seeking Grant Funding

The Steering Committee will utilize accepted FEMA principles to analyze the competitiveness of proposed action items for FEMA Pre-Disaster Mitigation Grants and other funding sources. The principles are described below:

Step 1: Examine funding requirements

The Steering Committee will identify how best to implement individual actions into the appropriate existing plan, policy, or program. The committee will examine the selected funding stream's requirements to ensure that the mitigation activity would be eligible through the funding source. The Committee may consult with the funding entity, Oregon Emergency Management, or other appropriate state or regional organization about the project's eligibility.

Step 2: Complete risk assessment evaluation

The second step in prioritizing the plan's action items was to examine which hazards they are associated with and where these hazards rank in terms of community risk. The committee will determine whether or not the plan's risk assessment supports the implementation of the mitigation activity. This determination will be based on the location of the potential activity and the proximity to known hazard areas, historic hazard occurrence, and the probability of future occurrence documented in the Plan. To rank the hazards, community's natural hazard risk assessment was utilized. This risk assessment identified various hazards that may threaten community infrastructure and population in a range from:

- Low
- Medium
- High

Step 3: Complete quantitative and qualitative assessment, and economic analysis

The third step is to identify the costs and benefits associated with natural hazard mitigation strategies, measures, or projects. Two categories of analysis that are used in this step are: (1) benefit/cost analysis, and (2) cost-effectiveness analysis. Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later. Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating natural hazards can provide decision makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

If the activity requires federal funding for a structural project, the Committee will use a Federal Emergency Management Agency- approved cost-benefit analysis tool to evaluate the appropriateness of the activity. A project must have a benefit cost ratio of greater than one in order to be eligible for FEMA grant funding.

For non-federally funded or nonstructural projects, a qualitative assessment will be completed to determine the project's cost effectiveness. The committee will use a multivariable assessment technique called STAPLE/E to prioritize these actions. STAPLE/E stands for Social, Technical, Administrative, Political, Legal, Economic, and Environmental. Assessing projects based upon these seven variables can help define a project's qualitative cost effectiveness.

Step 4: Committee recommendation

Based on the steps above, the committee will recommend whether or not the mitigation activity should be moved forward. If the committee decides to move forward with the action, the coordinating organization designated for the activity will be responsible for taking further action and documenting success upon project completion. The Committee will convene a meeting to review the issues surrounding grant applications and shared knowledge and or resources. This process will afford greater coordination and less competition for limited funds.

The Committee and the community's leadership have the option to implement any of the action items at any time, (regardless of the prioritized order). This allows the committee to consider mitigation strategies as new opportunities arise, such as funding for action items that may not be of highest priority. This methodology is used by the Committee to initially prioritize the plan's action items, in addition to maintaining the action list during annual review and update.

Chapter 2. UMATILLA COUNTY ACTION PLAN

Natural Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline	Reference	Plan Goals Addressed					
MULTI-HAZARD											
Short Term Multi-Hazard #1	Complete City Addendums to Umatilla County Hazard Mitigation Plan	UCEM	Incorporated Cities of Umatilla County	1 year	p. 31	X	X	X	X	X	X
Short Term Multi-Hazard #2	Create a public awareness campaign regarding natural hazards and tools to achieve disaster resistance	UCEM	ONHW, FEMA, OEM, ODOT, response agencies, County/City EM	1-2 years	p. 31	**X**	**X**	**X**	**X**		
Short Term Multi-Hazard #3	Promote hazard safety education	UCEM	Response Agencies	Ongoing	P.32		X		X		

Natural Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline	Reference	Plan Goals Addressed					
Long-Term Multi-Hazard #1	Utilize central location of Umatilla County EOC to create a regional emergency management and information hub	UCEM	Counties, Cities, Response Agencies, Private EM Crews, FEMA, OEM, ARC, ODOT, ODF, DOGAMI, DSL, USACE, USFS, CTUIR	5-12 years	p. 32	X	X	X	X	X	X
Long-Term Multi-Hazard #2	Develop a County GIS Department to oversee map generation and upgrades of current and future hazard prone areas	RS&D	CSEPP, UCEM, CTUIR, DOGAMI, ODOT, Response Agencies, City EM, ARC, Utilities and Transmission Companies, Local Media, Special Districts, FEMA, OEM	Start-up: 1-3 years Ongoing	P. 33	X		X	✕	X	X
WILDFIRE[5]											
Short-Term Wildfire #1	Work with agriculture and conservation groups to establish fire buffers between both forest and range wildland urban interface areas	UCEM	OEM, NRCS, ODA, USDA, SWCD, County/City Em. Mngrs. Agricultural Community	1-2 years	p. 37	X	X	X	X	X	
Short-Term Wildfire #2	Utilize UCEM to dedicate resources to full time fire prevention planning and education	UCEM	ODF, USFS, CTUIR, Response Agencies, Private Fire Companies	1-2 years	p. 38	X	X	X	X	X	

[5] Wildfire Action Items are specific to this Mitigation Plan. Action Items included in the CWPPs are co-adopted and included by reference to this plan. If the potential exists, Umatilla County may pursue Pre-Disaster Mitigation Grant funds to complete CWPP action items.

Natural Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline	Reference	Plan Goals Addressed					
Long-Term Fire #1	Work with citizens of Umatilla County to assure that all areas are protected under a rural fire district	Umatilla County	ODF, County/City Em. Mngrs., CTUIR, BLM, USFS	5 years	p. 38	✕	✕		✕	✕	✕
Long-Term Fire #2	Identify substandard interface access roads and provide incentive funding to bring roads up to current fire & life safety standards	UCEM	ODOT, County Public Works, CTUIR, OEM, Response Agencies	5-10 years	p. 39	X	X	X	X		X
Long-Term Fire #3	Provide logistics and grant writing support to Meacham Volunteer Fire Department to build a fire station that allows all equipment to be stored at a central location	Meacham Volunteer F.D.	UCEM	5-10 years	p. 39	X			X		X
Long-Term Fire #4	Complete feasibility studies of biomass potential on forest lands. Create incentive funding to test biomass technology in Umatilla County	UCEM	ODF, USFS, OECDD, State of Oregon, OEM, FEMA	5-10 years	p. 40	X	X		X	X	X
Long-Term Fire #5	Complete Upland Storage Ponds for wildlife benefit and to be used during wild land fire suppression efforts	WWBWC	UCEM, ODF, OWRD, DSL, DOGAMI, ODF&W, CTUIR, Landowners, Special Districts	Ongoing	p.40	X		X	X	X	X
FLOOD[6]											
Short-Term Flood #1	Seek landowners willing to develop conservation easements and riparian planting within mapped and unmapped flood plain areas	UCEM	SWCD, NRCS, ODA, USDA, CTUIR, Wheat League, FEMA	1-5 years	p. 45	X	X	X	X	X	

[6] Flood Action Items are specific to this Mitigation Plan. Action Items included in the Umatilla County Flood Mitigation Plan and USACE Flood Fight studies are co-adopted and included by reference to this plan. If the potential exists, Umatilla County may pursue Pre-Disaster Mitigation Grant funds to complete Flood Plan and/or USACE Flood Fight action items.

Natural Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline	Reference	Plan Goals Addressed					
Short-Term Flood #2	Identify areas able to absorb high-velocity stream flows w/o impacting investments (i.e. re-establish or create artificial floodplains). Establish connectivity and diversion infrastructure to be utilized during high water events to divert high water to these areas	UCEM	NRCS, SWCD, WWBWC, UBWC, CTUIR, ODF&W, USFWS, BOR, USACE, Special Districts, Landowners	1-5 years	p.45	X	X	X	X	X	
Short-Term Flood #3	Develop a database of all landowners within FEMA FIRM designated areas in the county. Use database to distribute outreach information and emergency notices related to flooding	UCEM	RS&D, FEMA, OEM, DOGAMI, Cities	2 years	p.46		X	X	X		
Long-Term Flood #1	Identify and map canyons and draws susceptible to high-water and flash flood event but not located on FEMA FIRM maps. Upgrade Flood Hazard Overlay Zone to limit development within those areas	Umatilla County Planning	UCEM, GIS, FEMA, DSL, USACE, CTUIR, OEM, Response Agencies	5 years	p.46	X	X	X	X		
Long-Term Flood #2	Attain funding to upgrade existing levees and berms to USACE standards to assure continuing flood protection	UCEM	FEMA, OEM, USACE, DSL, CTUIR, ODF&W, Special Districts	5 years	p. 47	X	X	X	X		
Long-Term Flood #3	Identify public and private bridges susceptible to collecting flash flood debris. Prioritize bridge improvements and/or replacement	Umatilla County Road Dept.	ODOT, USACE, CTUIR, FEMA, DSL	5 years	p. 47	X		X	X		X
SUMMER STORM											
Short-Term Summer Storm #1	Complete necessary tasks to obtain a NOAA NWS Storm Ready rating	UCEM	NOAA NWS, Dispatch, CSEPP	1-2 years	p. 53	X		X	X		X
Long-Term Summer Storm #1	Identify opportunities to advance NOAA NWS warning coverage via wireless and non-wireless infrastructure	UCEM	NOAA NWS, OEM, OSP, ODOT, CTUIR, Landowners	5 years	p. 54	X		X	X		X

Natural Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline	Reference	Plan Goals Addressed					
Long-Term Summer Storm #2	Implement a Tone Alert Radio program to provide TARs to all schools, communications stations and other interested private an public entities to increase advanced warning capabilities of NOAA NWS and UCEM	UCEM	NOAA NWS, OEM, FEMA, OSP, CSEPP, CTUIR, Special Districts	5 years	p. 55	X		X	X		X
WINTER STORM											
Short-Term Winter Storm #1	Complete necessary tasks to obtain a NOAA NWS Storm Ready rating	UCEM	NOAA NWS, Dispatch, CSEPP	1-2 years	p. 53	X		X	X		X
Long-Term Winter Storm #1	Identify opportunities to advance NOAA NWS warning coverage via wireless and non-wireless infrastructure	UCEM	NOAA NWS, OEM, OSP, ODOT, CTUIR, Landowners	5 years	p. 54	X		X	X		X
Long-Term Winter	Implement a Tone Alert Radio program to provide TARs to all schools,	UCEM	NOAA NWS, OEM, FEMA,	5 years	p. 55	X		X	X		X
Storm #2	communications stations and other interested private an public entities to increase advanced warning capabilities of NOAA NWS and UCEM		OSP, CSEPP, CTUIR, Special Districts								
Long-Term Winter Storm #3	Asses snow removal capabilities of Umatilla County. Provide funding for snow removal equipment in areas with minimal or no snow removal capabilities	UCEM	Cities, Response Agencies, Special Districts	5 years	p.60	X		X	X		X
EARTHQUAKE											
Short-Term Earthquake #1	Complete county wide assessment of structures vulnerable to earthquake damage. Attain funding to retro-fit high priority structures	UCEM	OEM, FEMA, Cities, Special Districts	1 year Ongoing	p. 62	X		X	X		X
Long-Term Earthquake #1	Support continuing work to identify all fault patterns in Umatilla County	UCEM	DOGAMI, USGS, OWRD, CTUIR	Ongoing	p. 63	X		X	X		

Natural Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline	Refer ence	Plan Goals Addressed					
VOLCANO											
Short-Term Volcano #1	Create volcano response protocols for protection from seismic activity and debris damage	UCEM	FEMA, OEM, NOAA NWS, ODOT, OSP, CTUIR, CSEPP, Cities, Response Agencies, Special Disticts	1 year Ongoing	p. 65	X		X	X		X
LANDSLIDE/DEBRIS FLOW											
Short-Term Landslide #1	Update Goal 7 of the Umatilla County Comprehensive Plan with maps designating landslide prone areas or areas where the SS Overlay Zone applies	Umatilla County Planning	DOGAMI, GIS, UCEM, Landowners	1 year Ongoing	P. 68	X		X	X	X	X
Long-Term Landslide #1	Identify and implement mitigation measures where important infrastructure for evacuation, emergency vehicle access, commodity transport, information dissemination and utilities may be prone to damage from site specific landslides	UCEM	DOGAMI, Public Works, Cities, ODOT, CTUIR, ODF, USFS, Special Districts, Utilities, CSEPP	3-10 years	p. 68	X		X	X	X	X
DROUGHT											
Short-Term Drought #1	Complete 2050 Water Management Plan	Umatilla County	Task Force, USFWS, BOR, USACE, CTUIR, FEMA, NOAA, DSL, OWRD, ODA, OECDD, ODF&W, UBWC, Landowners, Special Districts	1 year Ongoing	p. 76	X	X	X	X	X	
Long-Term Drought #1	Utilize Columbia River water for replacement of certificated groundwater irrigation rights	Umatilla County	BOR, CTUIR, State of Oregon, OWRD, Landowners, Special Districts	10-20 years	p. 77	X		X	X	X	

Natural Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline	Reference	Plan Goals Addressed					
Long-Term Drought #2	Provide funds for groundwater studies to ensure water resource sustainability	Umatilla County	CTUIR, USGS, OWRD, Landowners, Special Districts	5-10 years	p. 78	X	X	X	X	X	
Long-Term Drought #3	Complete settlement of CTUIR water claims and maximize benefit of Phase III infrastructure	Umatilla County	CTUIR, BIA, BOR, Landowners, Special Districts	5-15 years	p. 79	X	X	X	X	X	

Table 2-1: Umatilla County Action Plan

Chapter 3. COMMUNITY PROFILE

3.01 Geography and the Environment

Major Rivers

The Umatilla River headwaters are in the Blue Mountains, where the North and South Fork join to from the main stem, an 89-mile reach of river that flows through a series of broad valleys that drain low rolling lands. The main stem Umatilla River has eight main tributaries: the North and South Forks of the Umatilla River and Meacham Creek in the upper subbasin; Wildhorse, Tutuilla, McKay and Birch Creeks in the mid subbasin; and Butter Creek in the lower subbasin.

Climate

Umatilla County has a continental climate with a winter precipitation pattern. Precipitation levels vary from 8-10 inches along the Columbia River, to as high as 60 inches in the higher elevations of the Blue Mountains. Peak flows in the Umatilla River normally occur in the spring with high elevation snow melt, and diminish throughout the summer to the lows in August or september

Minerals and Soils

A turbulent past created the land through which the Umatilla River flows today. From about 16 million years ago to about 10 million years ago, massive volcanic eruptions spewed lava from fissures in the Earth's crust. About 300 separate lava flows poured out of the earth and cooled into basaltic rock during this time period. Since each flow can range in thickness from 3 to 300 feet, the total thickness of all the flows can be greater than 10,000 feet.[7] These rocks, the remnants of those enormous eruptions, are collectively referred to as the Columbia River Basalts, or CRBs.

In the time between flows, weathering and erosion broke up the top layer of the hard, black basalt; as new flows surged over the old, they created layers of breccia, or rubbly, broken-up rock.. Sedimentary deposits are present between some basalt flows. These layers were formed during periods of volcanic inactivity, when streams, lakes, and soil horizons formed on the basalt surface (Oberlander, 1981). While the middle of each basalt flow is dense and transmits little water, the interflow zones of breccia and sediment form productive aquifers.

Around the same time that the Columbia River Basalts were being formed, regional uplifting began creating the Blue Mountains. Basins and uplands began to form, rivers and streams began to run, and in some places, the running water

[7] Davies-Smith, 1988.

left sands, gravels, and boulders, materials known as alluvium. These places, past riverbeds and flood deposits, are today's alluvial aquifers.

3.02 Population and Demographics[8]

According to the 2000 U S census Umatilla County ranks as the 12th most populous Oregon County. The citizens of the county are a racially diverse group. Sixteen percent of the population list Hispanic or Latino as its racial group. The county has a significant Native American population who resides primarily (51%) on the Umatilla Indian Reservation located east of the City of Pendleton. A total of 3.4% of the county residents list their race as Native American. The average age in the county is 34.6 years with the majority ranging from 35 to 44 years of age. Other State of Oregon comparisons/rankings are:

- Net migration 20th
- Population under 15 years of age, 5th
- Population 15 to 64, 12th
- Population 65 and over, 29th
- Families below the Federal poverty level 9.8%

The current estimated population of Umatilla County is 73,878 people. The population density of Umatilla County is about 22 people per square mile which is lower than the State of Oregon average of about 32 people per square mile.[9]

Umatilla County is expected to grow to more than 106,000 people by the year 2040.[10] This estimate reflects a proposed 43% increase over a 35 year period.

Income

According to U.S. Census information, the median income for a household in Umatilla County is $36,249, and the median income for a family is $41,850. Males in the county have a median income of $31,479 versus $22,325 for females. The per capita income for the county is $16,410.

In Umatilla County, 12.70% of the population and 9.80% of families are below the poverty line. Out of the total population, 16.20% of those under the age of 18 and 8.70% of those 65 and older are living below the poverty line.11

Housing and Community Development

[8] State of Oregon Housing Division
[9] United States Census Bureau, 2006
[10] Oregon Office of Economic Analysis, 2006
[11] http://read-and-go.hopto.org/Umatilla%2DCounty%2DOregon/

Umatilla County residents primarily live in single family homes that were built in the 1970's. The median value of single family dwellings in Umatilla County is $98,100 with most homes valued below $100,000.

Employment and Industry

The unemployment rate in Umatilla County fell to a low of 6.3 percent in 2000 and while the 2003 level, at 8.5 percent, was higher, the 2.2 percent gain is favorable by statewide standards. Oregon's rate, at 4.9 percent in 2000 increased 3.3 percentage points to an annual average of 8.2 percent in 2003. Over the course of 2003, the unemployment rate in Umatilla County ranged from a low of 5.8 percent in October to a high of 12.3 percent in January. The region has an unusually high portion of its total employment in large firms. In some cases, these large employers provide a stabilizing influence. Government employment, particularly state correction facilities have provided such stability. There also are private employers that fit that characterization. [12]

Major Employers in Umatilla County[13]

Employer	Location	Employees
State of Oregon (Consolidated Operations)	Umatilla County	1,615
Confederated Tribes of the Umatilla Indian Reservation (Wildhorse Resort and Other Operations)	Mission	1,200
Wal-Mart Distribution Center	Hermiston	1,082
Smith Frozen Foods	Weston	900
Federal Government (All Operations)	Umatilla County	891
Lamb-Weston, Inc.	Hermiston	530
Fleetwood Travel Trailers	Pendleton	460
Good Shepherd Hospital	Hermiston	436
Umatilla County	Pendleton, Hermiston, Milton-Freewater	432
Eastern Oregon Correctional Institution	Pendleton	420
Blue Mountain Community College	Pendleton	420
Wal-Mart	Hermiston	360
Marlette Homes, Inc.	Hermiston	350
Pendleton School District	Pendleton	350
St. Anthony Hospital	Pendleton	300

[12] Oregon State Employment Division
[13] Pendleton Chamber of Commerce and area employers

Wal-Mart	Pendleton	235

Table 3-1: Major Employers in Umatilla County

A comparison of regional economies demonstrated that in relation to the rest of the state, Umatilla County is more specialized in farming, agricultural services, forestry, fishing, mining, construction, transportation and public utilities, retail trade, and both the Federal and State/local government sectors.[14] The following figure represents the diversity of employment in Umatilla County:

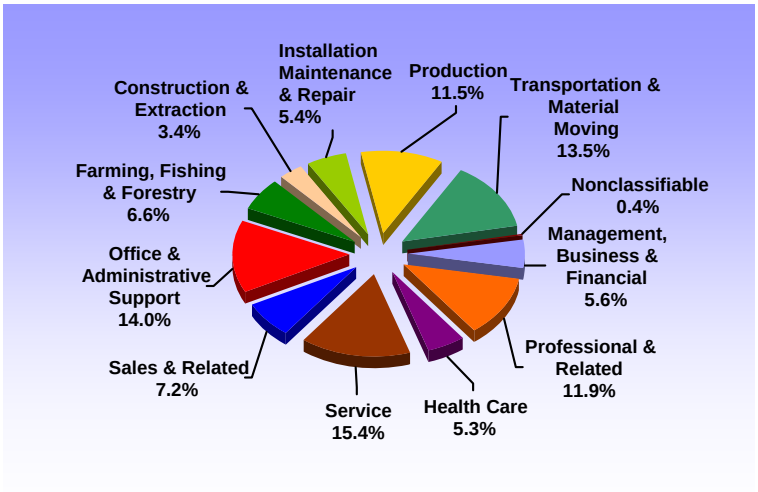

Figure B: 2004 Employment by Occupational Group. The occupational groups that employed the most people in the Morrow County/ Umatilla County (Region 12) were Service (15.4%), Office and Administrative Support (14.0%), Transportation and Material Moving (13.5%).[15]

Transportation and Commuting Patterns

Umatilla County is a multi-module transportation hub in Eastern Oregon. Automobile transportation within and through Umatilla County, with Interstate 84 dissecting the county east to west, and Interstate 82 traveling north into the Tri-Cities area of Washington is a major industrial and service asset to Umatilla County. In addition to major highway transportation systems, the county has significant water transportation facilities along the Columbia River and rail transportation services including a Union Pacific main rail line. Transportation infrastructure combined with natural gas transmission lines, an extensive electrical transmission grid, and wi-fi and fiber optic communications make Umatilla County marketable in terms of personal, information and commodity transport.[16]

3.03 Land and Development

[14] OSU Extension; Torgerson, Sorte & Nam, 2006
[15] OED, 2006
[16] Oregon State Employment Division

Umatilla County has an acknowledged Comprehensive Plan and Development Ordinance, which is in compliance with Statewide Planning Goals and Guidelines and Oregon land use laws encompassed in Oregon Revised Statutes (ORS) and Oregon Administrative Rules (OAR). Umatilla County's land use program provides opportunities for citizens to achieve their land use and property ownership objectives in accordance with state and local law.

Oregon and Umatilla County Planning History:

October 9, 1957	Order establishing the Umatilla County Planning Commission
January 8, 1959	Interim Zoning Ordinance established
July 22, 1959	Order classifying forest lands
August 26, 1960	Zoning & Land Use Ordinance Election for Lower McKay Creek Area
1962 & 1964	Amendments to 1959 Zoning Ordinance
July 5, 1964	Public notice and hearing on an Interim Zoning Ordinance for Hermsiton Urban Area
1969	Senate Bill 10 adopted requiring comprehensive planning and Zoning regulations by local governments.
June 30, 1970	Amendments to Interim Zoning Ordinance
October 16, 1970	Interim Senate Bill 10 Zoning Ordinance, Procedures and Provisions
July 19, 1972	Comprehensive Umatilla County Zoning Ordinance adopted
1974	Statewide Planning Goals adopted; State Uniform Building Codes adopted
May 9, 1983	Umatilla County Comprehensive Plan, Plan Map, Zoning Ordinance, Zoning Map and Technical Report submitted to the Oregon Land Conservation and Development Commission for acknowledgement of compliance with Statewide Planning Goals

November 21, 1985	Formal Land Conservation and Development Commission acknowledgement of Umatilla County Comprehensive Plan
1995	Periodic Review of Comprehensive Plan and Development Ordinance begun by Umatilla County
2005	Umatilla County submits final work task to formally complete Periodic Review

The Umatilla County Comprehensive Plan provides policies and guidelines for land use and development opportunities for land in Umatilla County. The Comprehensive Plan is the County's tool for complying with Oregon Statewide Planning Goals. The Umatilla County Development Ordinance provides the local regulatory mechanism to carry out the Comprehensive Plan and Oregon Statewide Planning Goals.

The twelve incorporated cities in Umatilla County each have their own Comprehensive Plan. All incorporated cities in Umatilla County also have an Urban Growth Boundary (UGB), required by law, which is intended to identify lands that are needed to satisfy the demands of population and employment growth for a 20-year period. The County and cities jointly manage the UGBs.

Chapter 4. HAZARD ASSESSMENT

4.01 Definition of a Hazard Assessment

Conducting a hazard assessment can provide information on the location of hazards, the value of existing land and property in hazard locations, and an analysis of risk to life, property, and the environment that may result from natural hazard events. Hazard assessments are subject to the availability of hazard-specific data

4.02 Federal Requirements for a Hazard Assessment

Recent federal regulations for hazard mitigation plans outlined in 44 CFR Part 201.6 (c) (2) includes a requirement for hazard assessment. This hazard assessment requirement is intended to provide information that will help communities to identify and prioritize mitigation activities that will reduce losses from the identified hazards. The federal criterion for hazard assessments and information on how the Umatilla County Mitigation Plan meets those criteria is outlined in Table 4-1 below.

Federal Criteria for Hazard Assessment

Section 322 Requirement	**How is this addressed?**
Identifying Hazards	Umatilla County has generated maps which is the result of mapping exercises at the EOC and meetings with each city and special district willing but unable to attend mapping exercises.
Profiling Hazard Events	The hazard sections of the Umatilla County Natural Hazard Mitigation Plan provide documentation for all of the large-scale hazard events affecting the region. Where data is available, Umatilla County has provided local impacts from historical hazard events.
Assessing Vulnerability: Identifying Assets	Appendix A and large scale maps housed at the Umatilla County Emergency Operations Center documents the community assets that are vulnerable to natural hazards.
Assessing Vulnerability: Estimating Potential Losses	Using the best available data, an estimate of potential losses from natural hazards is located in the hazard specific sections or in an appendix to this plan.
Assessing Vulnerability: Analyzing Development Trends	The Community Profile Section of this plan provides a description of development trends.

Table 4-1: Federal Critieria for Hazard Assessment

4.03 Components of the Hazard Assessment

Hazard Identification identifies the geographic extent and intensity of the hazard, the intensity of the hazard, and the probability of its occurrence. Maps are frequently used to display hazard identification data. Umatilla County identified eight major hazards that consistently affect this geographic area. These hazards – floods, landslides, wildfires, earthquakes, severe storms: summer and winter, volcanoes and drought – were identified through an extensive process that utilized input from Umatilla County Emergency Management and the Mitigation Plan Steering Committee. The geographic extent of each of the hazards has been identified by Umatilla County using the best available data and local knowledge. The extent of each hazard is included in the hazard specific sections later in this document.

Vulnerability Assessment/Inventorying Assets combines hazard identification with an inventory of the existing (or planned) property and population exposed to a hazard. A complete listing of the community assets in Umatilla County are included in Appendix A. Additionally, a more detailed description of the vulnerability of these assets is located in the specific hazard sections.

Risk Analysis/Estimating Potential Losses involves estimating the damage, injuries, and financial losses likely to be sustained in a geographic area over a given period of time. This level of analysis involves using mathematical models. The two measurable components of risk analysis are magnitude of the harm that may result and the likelihood of the harm occurring. Describing vulnerability in terms of dollar losses provides the community and the state with a common framework in which to measure the effects of hazards on assets. A risk analysis was completed when Umatilla County completed its CONPLAN compliant Emergency Operations Plan in 2003. Unfortunately, there is insufficient data for conducting an update to the risk analysis for the natural hazards affecting Umatilla County at this time. However, this need is identified in the action plan, and a complete risk assessment will be conducted when the resources are available.

4.04 Hazard Assessment Mapping Methodology

Community Assets: Vulnerability Assessment

Critical/Essential Facilities

Critical/Essential facilities are those necessary for government response and recovery activities (i.e. life safety and property, property and environmental protection, etc.) and must be protected to assure adequate management of emergency situations. These facilities include:

- 911/dispatch centers
- Emergency operation centers
- Police and fire stations
- Public works facilities
- Sewer and water facilities
- Corrections centers
- Public service buildings (courthouses, city halls, etc.)
- Etc.

A complete listing of all Critical/Essential facilities in Umatilla County was mapped utilizing FEMIS software and is included in Appendix A. As revealed in Appendix A most Critical/Essential facilities are located within the incorporated City Limits' of Umatilla County cities, but the larger incorporated cities (Pendleton, Hermiston, Umatilla and Milton-Freewater) do have some churches, fire stations, shelters, water supply and other critical facilities located within their urban growth boundaries or located within the rural areas adjacent to city boundaries.

Critical Infrastructure

Critical infrastructure includes those systems necessary for the day to day operation of Umatilla County. This infrastructure includes:

- Electricity transmission
- Natural gas and other utilities
- Arterial transportation including rail, air, auto and water
- Etc.

Critical infrastructure was mapped to assure that lines for commerce remain open to assure economic sustainability during times of emergency. Critical infrastructure was also mapped to assure evacuation routes and emergency vehicle access routes remain open during times of emergency.

A complete listing of all Critical Infrastructure in Umatilla County was mapped utilizing FEMIS software and is included in Appendix A.

Vulnerable Populations

Vulnerable populations include those facilities that house or could receive individuals with special needs to conduct day to day activities. These areas include:

- Hospitals and care centers
- Schools
- Nursing homes and assisted living facilities
- Etc.

These areas were mapped to assure their protection during hazard events and to identify means of evacuation to assure the protection of these populations is mitigation activities are not adequate to protect the facility from damage or loss.

A complete listing of vulnerable population centers was mapped utilizing FEMIS software and is included in Appendix A.

Cultural or Historical Assets

Cultural and Historical Assets were mapped utilizing FEMIS software and a complete listing in Umatilla County, provided by Oregon State Historic Preservation Office is as follows:

UMATILLA COUNTY					
ADAMS ODD FELLOWS HALL	190 MAIN ST	ADAMS	1885	08/05/1994	94000810
REESE & REDMAN GENERAL MERCHANDISE STORE	130 S MAIN ST	ADAMS	1885	08/08/1994	94000811
GREASEWOOD FINNISH APOSTOLIC LUTHERAN CHURCH	FINLAND CEMETERY RD	ADAMS VCTY	1884	07/14/1988	88001041
UMATILLA SITE (35-UM-1)	ADDRESS RESTRICTED	ADDRESS RESTRICTED		01/30/1981	81000522
WATTS, M L, HOUSE	FOURTH AT JEFFERSON	ATHENA	1926	03/09/1988	88000090
ARLINGTON HOTEL	131 W MAIN ST	ECHO	C1881	08/28/1997	97000897
BANK OF ECHO BUILDING	230 W MAIN ST	ECHO	1920	04/15/1982	82003747
CUNHA, JOSEPH, FARMSTEAD	33263 OREGON TRAIL RD	ECHO	1902	08/28/1997	97000898
ECHO CITY HALL	20 S BONANZA	ECHO	1915	08/28/1997	97000899
ECHO METHODIST CHURCH	1 BONANZA ST	ECHO	1886	08/28/1997	97000900
EDWARDS, JAMES, BUILDING	320 MAIN ST	ECHO	C1882	08/28/1997	97000901
KOONTZ, J H, BUILDING	141 N MAIN ST	ECHO	1905	08/28/1997	97000902
KOONTZ, JAMES AND CYNTHIA, HOUSE	210 N DUPONT ST	ECHO	C1881	08/28/1997	97000903
ST PETER'S ROMAN CATHOLIC CHURCH	MARBLE & LEEZER AVE	ECHO	1913	08/28/1997	97000905
UMATILLA MASONIC LODGE HALL	200 S DUPONT ST	ECHO	1864	08/28/1997	97000906
MEACHAM HOTEL	MAIN ST	MEACHAM	1899	08/08/2002	01000830
COLUMBIA COLLEGE	722 SOUTH MAIN ST	MILTON-FREEWATER	1910	01/21/2004	03001481
FRAZIER, WILLIAM S, FARMSTEAD	1403 CHESTNUT ST	MILTON-FREEWATER	1892	06/05/1986	86001234
IRELAND, SARAH E, INVESTMENT PROPERTY	311 S MAIN ST	MILTON-FREEWATER	C1890	01/21/1994	93001500
STILL-PERKINS HOUSE	112 SE 6TH AVE	MILTON-FREEWATER	1883	09/09/1993	93000925
WALLA WALLA VALLEY TRACTION CO PASS STATION & POWERHOUSE	403 ROBBINS ST	MILTON-FREEWATER	1907	09/09/1993	93000926
BOWMAN HOTEL	17 SW FRAZER AVE	PENDLETON	1906	11/06/1980	80003381
CLARKE, WILLIAM J AND LODEMA, HOUSE	203 NW DESPAIN AVE	PENDLETON	1912	06/13/1997	97000576
ELLIS-HAMPTON HOUSE	711 SE BYERS AVE	PENDLETON	1901	10/23/1986	86002909
EMPIRE BLOCK	21-37 SW EMIGRANT AVE	PENDLETON	1907	06/01/1982	82003748
HAMLEY AND COMPANY LEATHER GOODS STORE	30 SE COURT ST	PENDLETON	1900	06/09/1982	82003749
HENDRICKS BUILDING; K O T M TEMPLE	369 S MAIN ST	PENDLETON	1897	06/01/1982	82003750
JOHNSON-ELLIS HOUSE	326 SE SECOND ST	PENDLETON	C1899	03/14/1986	86000347
LADOW BLOCK	201-39 SE COURT AVE	PENDLETON	C1884	10/22/1992	92001381
MASONIC TEMPLE	18 SW EMIGRANT AVE	PENDLETON	1887	06/01/1982	82003751
MATLOCK-BROWNFIELD BUILDING	413-25 S MAIN ST	PENDLETON	1904	06/01/1982	82003752
MILARKEY BUILDING	203 S MAIN ST	PENDLETON	1883	09/23/1982	82003753
SOMMERVILLE, EDGAR, HOUSE	104 SE FIFTH ST	PENDLETON	1899	10/14/1980	80003382
SOUTH MAIN STREET COMMERCIAL HISTORIC DISTRICT	[DISTRICT]	PENDLETON	1887	10/10/1986	86003260
U S POST OFFICE & COURTHOUSE (TR)	104 SW DORIAN AVE	PENDLETON	1915	03/04/1985	85000544
UMATILLA COUNTY LIBRARY	214 N MAIN	PENDLETON	1916	08/15/1997	97000848
VEY, JOSEPH, HOUSE	1304 SE COURT PL	PENDLETON	1913	02/27/1986	86000299
SALING, ISHAM, HOUSE	NONE LISTED IN FILE	WESTON	1880	01/01/1976	76001590

Figure C: Cultural and historical assets in Umatilla County (Oregon State Historic Preservation Office)

These assets were mapped to assure protection of cultural and historic assets in Umatilla County. Protection of cultural and historic assets may increase quality of life and economic sustainability in Umatilla County.

Economic Assets

Economic Assets are businesses that employ large numbers of people, and provide economic security to residents of Umatilla County. If damaged, the loss of these economic centers could significantly affect economic stability and prosperity and therefore require mitigation measures to prevent natural hazards from affecting their future success.

As identified in Appendix A most economic assets in Umatilla County are located within the incorporated limits or urban growth boundaries of a city. This is primarily due to Oregon land use laws and goals, but some uses are within the direct jurisdiction of Umatilla County either due to grandfathered development or development that is better suited to rural areas (e.g. Hinkle switchyard and Calpine energy center).

Environmental Assets

Environmental assets are those parks, open spaces, green spaces, wetlands, and rivers that provide an aesthetic and functional service for the community. Due to the fact that the unincorporated area of Umatilla County is predominantly open space and/or in resource protection the environmental assets were not all mapped. Appendix A does include FEMIS maps relating to land cover and critical watersheds.

Water quality and quantity are the primary environmental concern in Umatilla County and have been mapped via water supply sources and critical watersheds in Appendix A. These environmental assets have a direct impact on the quality of life and economic sustainability and will be discussed in the drought section of this document.

Hazardous Materials

This hazard results from the use of chemicals and materials that pose a serious threat to life, property, and the environment. These materials, many of which are used in agricultural, industrial, and other modern technologies, are becoming increasingly complex. Accidents involving the release of hazardous materials may occur during the handling at industrial facilities that use such materials or during transportation of such materials by rail, highway, or river barge.

Umatilla Chemical Depot

Seven and a half million pounds of the nation's supply of chemical warfare agents is stored at the Umatilla Chemical Depot located in the northwest corner of Umatilla County. The U.S. Army has commenced incineration of these weapons. Until the weapons and hazardous agents are destroyed (estimated completion date is 2012) there remains the possibility of human or natural hazard related accidental release of agent that could bring grave consequences to the community.

4.05 Community Hazard Risk Assessment Summary

Hazard Definitions[17]

All areas of Umatilla County are subject to the effects of natural and man-caused disasters including, but not limited to the following:

1. Natural Disasters

a. Weather emergencies – thunderstorms, winter storms, floods, wind storms, dust storms, drought, snow, ice, avalanche, or tornado.

b. Geological emergencies – earthquake, landslide, or subsidence.

c. Epidemiological emergencies – infection of humans, animals, or agricultural products.

2. Human-caused Disasters

a. Fire and explosion emergencies – industrial, structural, forest and range, or transportation-related incidents.

b. Transportation emergencies – incidents involving aircraft, rail systems, watercraft, motor vehicles, or gasoline delivery pipelines.

c. Hazardous materials emergencies – gases, explosives, corrosives, flammable liquids and solids, oxidizers, poisons, chemical warfare agents, or radioactive materials in incidents at fixed sites or while in transport.

d. Civil disturbance emergencies – unlawful demonstrations, riots.

e. Utility emergencies – failure or disruption of electrical, telephone, water, natural gas or fuel pipelines, sewer or sanitation systems.

f. Nuclear emergencies – the accidental or deliberate detonation of nuclear weapons, deposition of radioactive materials (such as from an accident at the Hanford Nuclear Reservation or the Columbia Generating Station), or an incident involving the use or transportation of radiological materials.

g. Acts of terrorism or sabotage.

[17] Hazard Risk Assessment completed for the Umatilla County Emergency Operations Plan, Adopted December 17, 2003.

Acts of Terrorism or Sabotage: Hazards Analysis Criteria

Acts of terrorism or sabotage became important concerns following the intentional bombing of the Murrah building in Oklahoma City. In 1995, following the Presidential Decision Directive 39 (PDD-39), specific measures were undertaken by the Federal Government to enhance interagency cooperation and implement measures to reduce U.S. vulnerabilities to such actions. As part of the planning process, the Department of Justice, Office of Domestic Preparedness prepared a detailed terrorism hazard vulnerability assessment process. A terrorist act is defined as an act planned by an individual or individuals "whoever knowingly possesses any biological agent, toxin or delivery system of a type or in a quantity that under any circumstances is not reasonably justified by a prophylactic, protective, bona fide research, or other peaceful purpose. In this subsection, the terms "biological agent" and toxin do not include any biological agent or toxin that is in its naturally-occurring environment, if the biological agent or toxin has not been cultivated, collected or otherwise extracted from its natural resource."[18] In analyzing the risk posed by specific hazards, rating criteria and weighting factors have been used. This formula is based on a point-value based on the following:

In analyzing the risk posed by specific hazards, rating criteria and weighting factors have been used. This point-value formula is based on the following[19]:

- High = 10 points
- Moderate = 5 points
- Low = 1 point

Weighting factors are determined by the following:

1. **Event History** is based on the number of incidents equivalent to a major emergency. **Weighting Factor is 2.**

    - High = 4 or more events in last 100 years = 20
    - Moderate = 2 or 3 events in last 100 years = 10
    - Low = 1 or 0 events in last 100 years = 2

2. **Vulnerability** is based on the percentage of population or property likely to be affected. Weighting Factor is 5.

    - High = More than 10% of population affected = 50
    - Moderate = 1-10% of population affected = 25

[18] U.S. Department of Justice 28 CFR Section 0.85(k)(1)

[19] Umatilla County Emergency Operations Plan Dec 2003

- Low = Less than 1% of population affected = 5

3. **Maximum Threat** is based on the percentage of population or property that could be affected in a worst-case incident. Weighting Factor is 10.

    - High = > 25% of population potentially affected = 100
    - Moderate = 5-25% of population potentially affected = 50
    - Low = < 5% of population potentially affected = 10

4. **Probability** is based on the likelihood of an occurrence happening within a specified **period of time. Weighting Factor is 7.**

    - High = One incident within a 10-year period = 70
    - Moderate = One incident within a 50-year period = 35
    - Low = One incident within a 100-year period = 7

Umatilla County Hazards Analysis Matrix

	History (Weighting Factor=2)	Vulnerability (Weighting Factor=5)	Max Threat (Weighting Factor=10)	Probability (Weighting Factor=7)
Weather Emergencies (Total Score 240)	**High 20**	**High 50**	**High 100**	**High 70**
Hazmat (Total Score 165)	**High 20**	**Moderate 25**	**Moderate 50**	**High 70**
Flood (Total Score 165)	**High 20**	**Moderate 25**	**Moderate 50**	**High 70**
Fire (Total Score 165)	**High 20**	**Moderate 25**	**Moderate 50**	**High 70**
Earthquake (Total Score165)	**Moderate 25**	**Moderate 25**	**High 100**	**Moderate 15**
Nuclear Incident (Total Score 159)	**Low 2**	**High 50**	**High 100**	**Low 7**
Radiological Incident (Total Score 159)	**Low 2**	**High 50**	**High 100**	**Low 7**
Transportation (Total Score 165)	**High 20**	**Moderate 25**	**Moderate 50**	**High 70**
Chemical Weapons (Total Score 134)	**Low2**	**Moderate 25**	**High 100**	**Low 7**
Civil Disturb. /Terrorism (Total Score 130)	**High 20**	**Moderate 25**	**Moderate 50**	**Moderate 35**

Table 4-2: Umatilla County Hazards Analysis Matrix

Scoring: High = 10 points Moderate = 5 points Low = 1 point

Identified Hazards

Based on the hazards analysis criteria shown above, the following hazards are considered to be of greatest risk to Umatilla County. Note that levels of risk are based on major emergency events, not worst-case incidents.

Weather Emergencies (excludes flooding) **240 points**

Winter storms generally involve severe snow and ice storms which can result in power outages and disrupt transportation. The characteristics of weather hazards are determined by a variety of meteorological factors such as amount of snow or rainfall, air temperature, wind velocity and temperature, ground saturation or snow-pack conditions. Umatilla County has suffered severe winter storms in the past and there is no reason to believe that the situation will change. Some areas of Umatilla County are also subject to risk from avalanche; however these areas are primarily in the high country of the Blue Mountains and pose minimal risk most of the population.

Drought involves a period of prolonged dryness resulting from a lack of precipitation or diversion of available water supplies. Umatilla County has suffered periods of drought in the past; however the main impact of drought has

been on agriculture, fish, and wildlife, as well as an increased fire risk. A severe drought could require strict water conservation measures to ensure an adequate supply of potable water.

Other hazards related to weather may include windstorms or tornadoes. Windstorms may occur suddenly and can cause damage to homes and property and disrupt vital utilities. Dust storms may occur as well. In 1999, seven people in Umatilla County were killed when a dust storm caused traffic accidents on I-84. A 1995 wind and hail storm in the western part of the county caused millions of dollars of damage to vehicles, structures and crops. Tornadoes periodically touch down in Umatilla County but they have not caused major damage.

Fire **165 points**

Umatilla County's urban areas face structural fire hazards typical of jurisdictions with a mix of residential, business and industrial areas. No high-rise buildings are located in the county; however, large numbers of people could be threatened at public-gathering places. Approximately 12% of the county consists of forest land used by the timber industry and for recreation. This land constitutes a significant threat for forest fires. In addition, the county faces the threat of wild lands/urban interface fires from large areas of rangeland and dry land crops coming in contact with continuing residential construction in the interface zones in the county.

Flooding **165 points**

This hazard generally involves a rise in rivers or creeks resulting from heavy rain or rapid melting of the annual snow pack. The Columbia River is located on the northern edge of Umatilla County. Major flooding could also result from failure of a dam. Umatilla County has a number of rivers and creeks that could be subject to flooding. Specific response plans have been written for a general flood response.

Hazardous Materials **165 points**
(Excludes chemical agents at UMCD)

This hazard results from the use of chemicals and materials that pose a serious threat to life, property, and the environment. These materials, many of which are used in agricultural, industrial, and other modern technologies, are becoming increasingly complex. Accidents involving the release of hazardous materials may occur during the handling at industrial facilities that use such materials or during transportation of such materials by rail, highway, or river barge. Union Pacific Railroad's main line carries thousands of rail cars filled with hazardous materials through Umatilla County each year, and its rail yard south of Hermiston at Hinkle receives, reconfigures, and dispatches 40 to 50 trains per day.

Earthquake **165 points**

Earthquakes are created by tectonic movement within the earth's crust. This movement is manifested as localized ground shaking with possible soil

liquefaction. After the initial seismic event, tremors or aftershocks can occur for an extended period of time resulting in continued structural damage. There are several known fault lines throughout Umatilla County with further geological analyses ongoing. An earthquake measuring 5.8 occurred on July, 1936 and caused damage throughout the county, especially in the Milton-Freewater area. Recent evaluation of the earthquake potential in the Pacific Northwest indicates that the earthquake threat has been underestimated and the seismic rating for the area may be increased in the near future.

Transportation **165 points**

This hazard may include major incidents involving motor vehicles, trains, aircraft, or water vessels. Primary risk from this hazard would be posed if such incidents included a release of hazardous materials, fire or explosion, or large numbers of casualties. An airline crash, train derailment, or other mass casualty incident could result in a major transportation emergency or disaster. U.S. Interstate (I) 84 travels through Pendleton; I-82 proceeds north from Hermiston. All Interstate routes are heavily used by the trucking industry in addition to motorists.

Nuclear Incident **159 points**

The Hanford Nuclear Reservation and Columbia Generating Station are located northwest of Umatilla County. If there was a release of radioactive material, Umatilla County is located in the ingestion zone.

While the probability of a nuclear incident occurring in Umatilla County is low, the maximum threat posed by an accidental or intentional release of radioactive material, or intentional detonation of a nuclear device is extremely high. Risk is posed not only by the direct effects (such as blast and heat), but also by the lingering effects of radioactive fallout.

Radiological Incident **159 points**

A conventional explosive device incorporating radioactive materials, sometimes referred to as a “dirty” bomb, poses a threat to county persons and property. Explosive and incendiary devices are relatively simple to construct. Acquisition of radiological material such as cesium is also possible. Dirty bombs theoretically will cause large scale contamination of an area, and potentially expose people, livestock and agriculture. The greatest impact of a radiological incident is the fear which would be generated within the public (terrorism). A radiological incident could also occur during the ground transportation of radiological waste as part of Waste Isolation Pilot Plant (WIPP) shipments.

Chemical Weapons **134 points**

Civil Disturbance/Terrorism **130 points**

This hazard might include riots, protests, strikes, demonstrations, or acts of terrorism that may result in the hostage taking, damage to property, or sabotage and extortion. Terrorism events might include arson, bomb threats or events, and other unlawful activities. Umatilla County's risk for civil disturbance and terrorism was rated at 13 in the Department of Justice (DoJ) Risk Assessment conducted in Fiscal Year (FY) 2001.20

[20] See U.S. Department of Justice Website at <http://www.usdoj.gov/>. Accessed September 17, 2003.

Chapter 5. NATRUAL HAZARDS

This section provides information on the process used to develop goals and action items that pertain to the seven natural hazards addressed in the mitigation plan. It also describes the framework that focuses the plan on developing successful mitigation strategies. The framework is made up of three parts: the *Mission*, *Goals*, and *Action Items*.

The Mission and Goals of the Mitigation Plan were discussed earlier in this document and pertain to all natural hazards experienced in Umatilla County. This section will give the hazard background of each listed natural hazard, as well as an overview of existing mitigation resources and identified *Action Items* that could improve disaster resistance and resilience in the rural, unincorporated area of Umatilla County. Some of these action items will also be coordinated with special districts and incorporated cities to increase their disaster resistance.

Figure D: Umatilla River Flooding near Pendleton in the 1960's (United States Army Corps of Engineers)

5.01 Multi-Hazard

Multi-hazard action items are those activities that could provide mitigation tools for a combination of seven of the eight hazards in the Mitigation Plan: flood, landslide, wildfire, severe winter storm, summer storm, earthquake, and volcanic eruption. As will be covered later, hazards associated with drought require hazard specific mitigation activities not required by other natural hazards.

As stated in the introduction, Umatilla County encompasses a vast network of utility and transportation infrastructure including natural gas, electricity, and fiber optic transmission as well as multi-model transportation via freeway, highway, air, rail and barge. This infrastructure is vital to the economic sustainability of Umatilla County, as well as other areas of the state and nation. This infrastructure is also vulnerable to multiple hazards in Umatilla County.

The information and transportation infrastructure of Umatilla County is vitally important to emergency response and public safety when natural hazards occur. Due to the rural nature of Umatilla County, access to hospitals, shelters and health care centers is not as readily available as predominantly urban counties and usually requires transport via ambulance or private vehicle on one of the county's rural or highway road systems. Additionally, some of the inhabited areas of Umatilla County have only one access road for emergency response vehicles to get into or for residents to utilize during hazard events requiring evacuation. To ensure public safety during times of emergency these access routes must remain open.

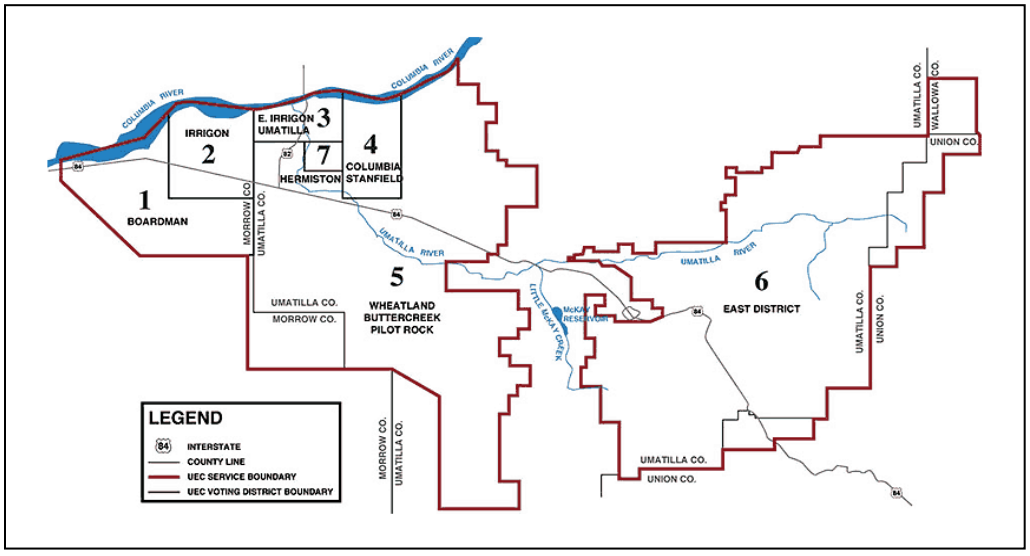

Figure E: Umatilla Electric Cooperative Service Area[21]

Existing Multi-Hazard Programs, Response and Mitigation Activities

[21] www.ueinet.com

Umatilla County Emergency Operations Center

Due to the Umatilla Chemical Depot and the Chemical Stockpile Emergency Preparedness Program (CSEPP) Umatilla County has a sophisticated and technologically advanced emergency communication and coordination system. This system includes wireless communication, traffic control points, multiple reader boards and other systems to help manage an emergency. The system is coordinated through Umatilla County Emergency Management and the Umatilla County Emergency Operations Center (EOC) and Joint Information Center (JIC).

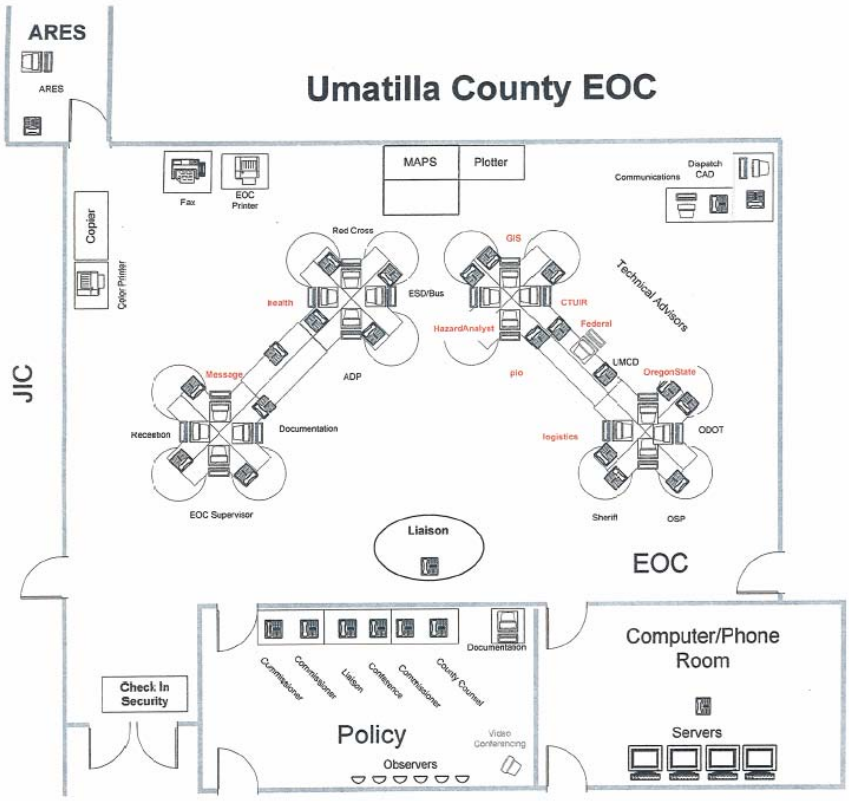

Figure F: Layout of Umatilla County Emergency Operations Center

In the event of an emergency the EOC and JIC are activated to provide information, logistic, and technical support to response agencies and personnel. Once activated, the EOC can monitor and map events, track response, catalogue resources and coordinate activities through the use of weather stations, river flow gauges, water quality stations, 450 and ARES communications, road reader boards, etc. Maps of existing resources available to the EOC can be found in Appendix A. The EOC also provides a central location for all agencies to coordinate mitigation and response activities.

Figure G Umatilla County EOC and JIC (Umatilla County Emergency Management)

A priority of Umatilla County is to maximize the potential that the EOC and JIC has to offer throughout the life of the CSEPP program and beyond as a regional emergency management hub.

Hazard Management Plans

Most Utility companies are required to maintain hazard management plans. Plans for gas and electric utility companies in Umatilla County are proprietary due to security reasons but are housed at the Umatilla County EOC to be utilized as resources during the event of an emergency.

Survey Results

Survey results revealed the following mitigation/response tools that may be utilized for multiple hazard applications:

- Irrigation districts have equipment to help with sandbagging, response, etc. Irrigation districts can also assist with public outreach through newsletters and public district meetings.
- ODOT currently has manpower and equipment dedicated to traffic control and road maintenance/clearing.
- OSP handles public safety during hazard events and has boats to assist during emergencies requiring assistance via watercraft.
- DOGAMI has existing resources dedicated to floodplain stability projects and mine site slope stability.
- Rural fire districts provide multi-hazard emergency response and are a valuable outreach mechanism for first aid, fire safe construction, location awareness and 911 procedures.

Survey results can be found in Appendix E.

Multi-Hazard Action Items (MH)

Multi-hazard action items are those activities that pertain to all seven hazards in the mitigation plan: flood, landslide, wildfire, severe winter storm, summer storm, earthquake, and volcanic eruption.

ST -MH[22]#1: Complete City Addendums to Umatilla County Hazard Mitigation Plan.

Ideas for Implementation:

- Umatilla County coordinate with contractor hired with Pre-Disaster Mitigation Grant funds to complete city addendums
- Utilize planning process as an outreach tool to organize City Council and special district meetings to address area specific natural hazard probability and mitigation
- Attain funding for cities to complete Cost/Benefit analysis on high priority mitigation projects

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	1 Year
Plan Goals Addressed:	Property Protection, Public Outreach, Planned Prevention, Agency/Citizen Coordination, Natural Resource Protection, Emergency Service Planning

[22] Short Term Multi-Hazard Action Item

Priority : High
Cost/Benefit Outlook: **Funded**

ST –MH #2: Complete a Public Awareness Campaign Regarding Natural Hazards and Tools to Achieve Disaster Resistance.

Ideas for Implementation:

- Attain funding to generate a county wide handout outlining hazard prone areas, as well as other visual handouts and objects
- Utilize annual CSEPP calendar to provide space for natural hazard awareness
- Work with interest groups and special districts to introduce final Mitigation Plan and schedule workshops and presentations regarding natural hazard awareness.

Coordinating Organization: Umatilla County Emergency Management
Timeline: 1-2 years
Plan Goals Addressed: Property Protection, Public Outreach, Planned Prevention, Agency/Citizen Coordination, Natural Resource Protection
Priority : High
Cost/Benefit Outlook: Good due to minimal funding requirements and multiple potential funding sources

ST –MH #3: Promote hazard safety education.

Ideas for Implementation:

- Attain funding for response agencies to conduct hazard safety education include outreach materials
- Utilize response agencies to provide education materials relating to what the public should do in the event of an emergency.
- Develop a “what to do in case of emergency” brochure complete with contact information for response agencies, shelters, utilities, hospitals, dispatch, etc.

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	On-Going
Plan Goals Addressed:	Public Outreach, Agency/Citizen Coordination
Priority :	Moderate
Cost/Benefit Outlook:	Good due to minimal cost

LT –MH #1[23]: Utilize central location of Umatilla County EOC to create a regional emergency management and information hub.

Ideas for Implementation:

- Assess available space of EOC and JIC and begin communications with local, state and federal parties interested in locating all or part of their logistics and support personnel at a central location.
- Begin pursuing MOAs and MOUs to formalize a regional emergency and information response hub
- Attain funding to add vehicle and storage space for absentee responders or first responders.
- Attain funding to maintain existing communications network established by the CSEPP program.

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	5-12 years
Plan Goals Addressed:	Property Protection, Public Outreach, Planned Prevention, Agency/Citizen Coordination, Natural Resource Protection, Emergency Service Planning
Priority :	High
Cost/Benefit Outlook:	Fair due to uncertainty of coordination and support from other agencies.

[23] Long-Term Multi-Hazard Action Item

LT –MH #2: Develop a county GIS department to oversee map generation and upgrades of current and future hazard prone areas.

Ideas for Implementation:

- Attain funds to fully digitize property and zoning maps of Umatilla County
- Develop and maintain a GIS inventory of all critical facilities, major employers, public areas, shelters, lifelines (transportation, etc.) and major transmission facilities
- Develop digital overlays of natural hazard prone areas and potential hazard mitigation project areas
- Utilize GIS to continually evaluate asset vulnerability by comparing existing and proposed developments with hazard-prone areas.
- Attain funding for on-going GIS maintenance and pursue agreements to cost share GIS program

Coordinating Organization:	Umatilla County Department of Resource Services and Development
Timeline:	Start – Up: 1-3 years Program: On-Going
Plan Goals Addressed:	Property Protection, Planned Prevention, Agency/Citizen Coordination, Natural Resource Protection, Emergency Service Planning
Priority :	High
Cost/Benefit Outlook:	Start-Up Funded. Maintenance fair unless formal agreements completed to cost share program

5.02 WILDFIRE

Umatilla County's urban areas face structural fire hazards typical of jurisdictions with a mix of residential, business and industrial areas. No high-rise buildings are located in the county; However, large numbers of people could be threatened at public-gathering places. Approximately 12% of the county consists of forest land used by the timber industry and for recreation. This land constitutes a significant threat for forest fires. In addition, the county faces the threat of wild lands/urban interface fires from large areas of rangeland and dry land crops coming in contact with continuing residential construction in the interface zones in the county.

Figure H : 2006 Sharps Ridge Fire near Ukiah, Oregon (Umatilla National Forest)

Two Community Wildfire Protection Plans were completed in Umatilla County in 2006. These plans give a complete hazard history of wildland fires in the forested areas of Umatilla County and have been included as part of this plan in Appendix B. Due to these plans a hazard history was not recreated in this chapter.

Existing Wildfire Protection and Mitigation Activities

Rural Fire Protection Districts
Eleven Rural Fire Protection Districts and one private fire department provide wildland urban interface fire protection to most inhabited areas in Umatilla County. Areas not covered by rural fire districts may fall within the fire protection boundaries of the Oregon Department of Forestry or may not be protected.

Senate Bill 360
Umatilla County is with the Oregon Department of Forestry on Oregon Senate Bill 360 plan implementation to regulate existing and proposed non-resource zoned development in wild lands/urban interface areas. These regulations are primarily to promote defensible space and fire free areas around structures.

Umatilla County Development Ordinances
Oregon Administrative Rule requires fire sighting safety standards for all dwellings placed in the Grazing Farm (Forest Zone) of Umatilla County. These fire sighting standards are codified in the Umatilla County Development Code under Section 152.084(B)(3).

In addition to fire standards required by OAR, Umatilla County requires that all new conditional uses, subdivisions and partitions within non-resource zoned interface areas comply with specific access standards and conform to recommendations of a rural fire protection district if the development is within the boundaries of that district.

Community Wildfire Protection Plans
The Blue Mountain/Foothills Region and Mill Creek Community Wildfire Protection Plans (CWPP) lay out action items to deal with pre-fire disaster mitigation planning. These CWPPs also evaluate existing mitigation and response resources and identify areas for improvement.

The action items identified by the CWPPs are co-adopted by this plan via Appendix B. Umatilla County Emergency Management and Planning Departments plan to work with the Oregon Department of Forestry to obtain grant funding to complete the action items addressed in the CWPPs. In addition to the action items identified in the CWPPs, action items have been identified in the Mitigation Plan to utilize an additional funding source for projects unsuitable for CWPP funding sources.

City Hazard Analysis
The table below identifies wildfire hazards and their rankings for the individual cities. The same methodology was used for ranking as utilized in the risk assessment. Local information was included into the rankings to provide a realistic view of the hazard.

City Hazard (Wildfire) Analysis Ranking

Hazard **Fire**	Location	History	Vulnerability	Maximum Threat	Probability	(Mitigation Measures)
City of Umatilla						
Wildfire	Old town site	High	High	High	High	Build fire breaks, manage site –cut brush
Wild fire	Industrial site east of town	High	High	High	High	Fire Breaks, Manage site
Wildfire	Cemetery, Mormon Church	High	High	High	High	Fire Breaks, Manage site
City of Stanfield						
Wildfire	River Road	High	Moderate	Moderate	High	Manage site, remove dead brush., UPRR spark arrestors
City of Echo						
Wildfire	UPRR tracks, west city limit	High	High	High	High	Manage right of way, sparking
Wildfire	Along Umatilla River	High	Moderate	Moderate	High	Manage site
Wildfire	Golf course hill	Moderate	Moderate	Moderate	High	Steep hillside manage site
City of Pilot Rock						
Wildfire	Wheat fields, southwest	Moderate	Moderate	Moderate	High	Plow fire breaks
City of Helix						
Smoke from wildfires	Roads in and out	Moderate	Moderate	Moderate	Moderate	
City of Adams						

Fire	Wheat fields surrounding	High	High	High	High	Fire breaks around town
City of Pendleton						
Wild fire	West side of town	High	Moderate	Moderate	High	Fire breaks, field fire equip.
City of Athena						
Wildfire	City is surrounded	High	High	High	High	Maintain existing agreements with farmers to till crop land right after harvest

Table 5-1: City Hazard Analysis (Wildfire) Ranking

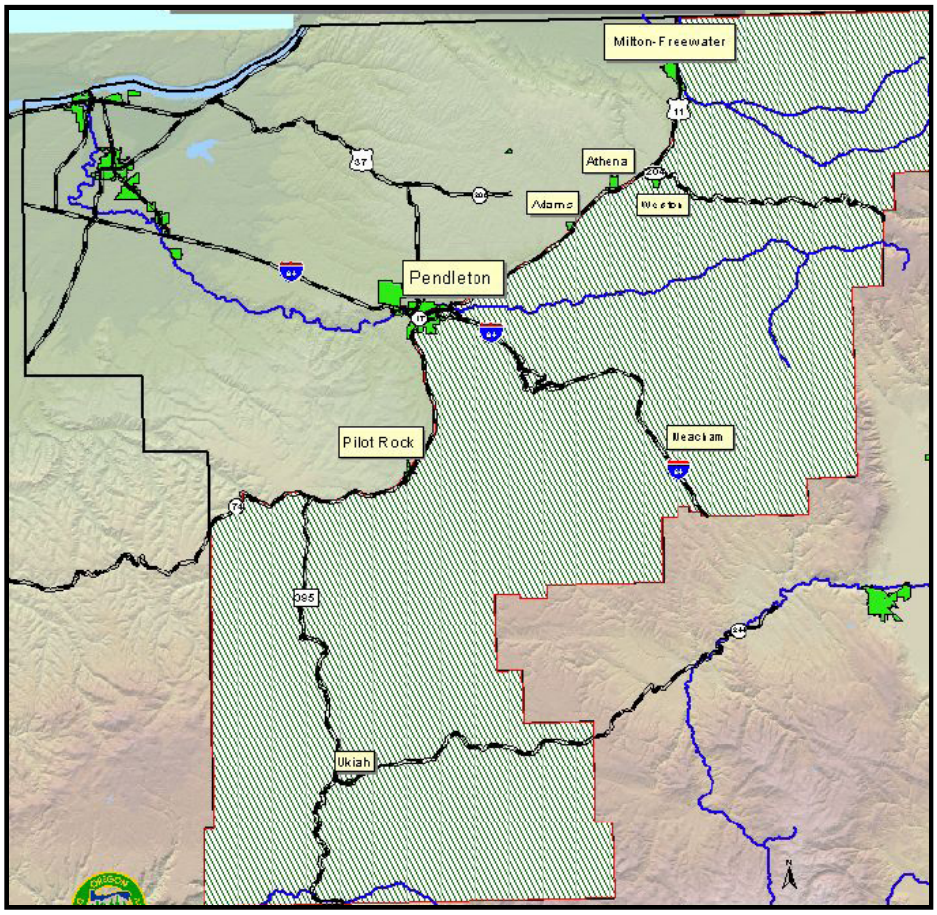

Figure I: Area Covered by Oregon Department of Forestry Community Wildfire Protection Plans (Oregon Department of Forestry)

Umatilla County Weed Ordinance[24]

The control of noxious weeds is a total community effort, requiring all landowners/operators to control the growth and spread of noxious weeds on their land and to prevent the infestation of adjacent lands. The Umatilla County Weed Control Board is dedicated to promoting Integrated Vegetation Management (IVM), specifically regarding noxious weed control. Voluntary compliance with the State Noxious Weed Control Law and Umatilla County Weed Control Ordinance is the preferred outcome. In the interest of keeping up to date with changes and progresses in laws, products, management strategies, and the like, the Supervisor, and staff maintain membership in industry related organizations. Weed Control staff or a representative can visit property if request to help identify weeds or to see if weeds need to be managed. They can make recommendations based on the use of land, native vegetation, soil types, elevation, and proximity to water sources, and more. This inspection is provided

[24] http://www.co.umatilla.or.us/index.htm

free of charge on an as time permits basis. Phone 541-278-5462 Fax 541-278-5427 E-mail: ucwd@bmi.net

To codify the Umatilla County Weed Control program the Umatilla County Board of Commissioners have adopted a Weed Control ordinance (Chapter #97 of the Umatilla County Code of Ordinances)

Umatilla County Fire Prevention and Protection and Smoke Management Ordinances

Chapters 91 and 95 of the Umatilla County Code of Ordinances include provisions for regulating all agricultural and non-agricultural burning outside of fire districts. These ordinances generally relate to air quality concerns but provide legal authority for the Board of Commissioners to ban burning during times of the year when dangerous fire weather conditions exist.

Survey Results

Survey results revealed the following mitigation/response tools that may be utilized for wildfire hazard applications:

- ODOT has manpower & equipment dedicated to traffic control and road maintenance
- Rural fire districts currently promote fire safe education and other related outreach, as well as encourage landowners to observe Oregon Department of Forestry fire prevention practices

Wildfire Action Items (WF)

Wildfire action items are those activities that pertain to mitigation of fire related hazards in Umatilla County.

ST –WF[25] #1: Work with agriculture and conservation groups to establish fire buffers between both forest and range wild land urban interface areas.

Ideas for Implementation:

- Map existing range and forest interface areas where buffering could be a mitigation tool
- Attain funding to hire contractors to design and complete fire buffers
- Work with Federal agencies assigned to conservation programs to assure that landowners remain compensated even when agreeing to install fire buffers
- Dedicate funding to on-going operation and maintenance of fire buffers to assure benefits

[25] Short-Term Wildfire Action Item

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	1-2 years
Plan Goals Addressed:	Property Protection, Public Outreach, Planned Prevention, Agency/Citizen Coordination, Natural Resource Protection
Priority :	High
Cost/Benefit Outlook:	Good due to minimal implementation and O&M costs of buffers. Need to address federal conservation programs to assure compensation is not precluded if a landowner agrees to establish fire buffers.

ST –WF #2: Utilize Umatilla County Emergency Management to dedicate resources to full time fire prevention planning and education.

Ideas for Implementation:

- Utilize central location and resources of Umatilla County Emergency Management to develop a fire outreach campaign.
- Work with response agencies to identify areas and individuals needing outreach and information.
- Attain funding to publish outreach materials and mail them to identified individuals

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	1-2 years
Plan Goals Addressed:	Property Protection, Public Outreach, Planned Prevention, Agency/Citizen Coordination, Natural Resource Protection
Priority :	High
Cost/Benefit Outlook:	Good due to minimal cost. Need some support on the effectiveness of outreach activities

LT–WF[26] #1: Work with citizens of Umatilla County to assure that all areas are protected under a functioning rural fire district.

Ideas for Implementation:

- Utilize central location and resources of Umatilla County Emergency Management to develop a fire outreach campaign identifying the benefits of being located within a rural fire district
- Map areas that are not within a rural fire district and identify options to consider most efficient ways to include those properties
- Attain funding to publish outreach materials and mail them to identified individuals
- Gauge public interest and support prior to formally introducing the concept
- Attain funding for start-up costs (equipment, etc.) and utilize special assessment options to cover annual operation costs

Coordinating Organization:	Umatilla County
Timeline:	5 Years
Plan Goals Addressed:	Property Protection, Public Outreach, Agency/Citizen Coordination, Natural Resource Protection, Emergency Service Planning
Priority :	High
Cost/Benefit Outlook:	Unknown due to lack of information on equipment and personnel needs as well as unknown level of public support.

[26] Long Term Wildfire Action Item

LT –WF #2: Identify substandard interface area access roads and provide incentive funding to bring roads up to current fire & life safety standards.

Ideas for Implementation:

- Coordinate with ODF and rural fire districts to map existing substandard access roads.
- Work with response agencies to identify areas and individuals needing outreach and information to explain the improvement program.
- Attain funding to publish outreach materials and mail them to identified individuals
- Attain funding to provide cost share and incentive funding to those people that participate in road upgrades

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	5-10 years
Plan Goals Addressed:	Property Protection, Public Outreach, Planned Prevention, Agency/Citizen Coordination, Emergency Services Planning
Priority :	High
Cost/Benefit Outlook:	Unknown until mapping of substandard roads is completed.

LT –WF #3: Provide logistics and grant writing support to Meacham Volunteer Fire Department to build a fire station that allows all of their equipment to be stored at a central location.

Ideas for Implementation:

- Utilize Pre-Disaster Mitigation Grant funding to complete upgrades too or construct a new fire station in Meacham.
- Provide technical and logistical support to Meacham if needed.

Coordinating Organization:	Meacham Volunteer Fire Department
Timeline:	5-10 years
Plan Goals Addressed:	Property Protection, Agency/Citizen Coordination, Emergency Services Planning
Priority :	High

Cost/Benefit Outlook:	Unknown until Meacham Volunteer Fire Department submits documentation of need.

LT –WF #4: Complete feasibility studies of biomass potential on forest lands. Create incentive program to test biomass technology in Umatilla County.

Ideas for Implementation:

- Work with timber industry and agencies to complete assessment of biomass potential on private, state and federal forest lands
- Identify potential areas to implement biomass technology
- Attain funding to complete feasibility studies and to develop an incentive program to implement pilot biomass technology projects

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	5-10 years
Plan Goals Addressed:	Property Protection, Public Outreach, Agency/Citizen Coordination, Natural Resource Protection, Emergency Services Planning
Priority :	Moderate
Cost/Benefit Outlook:	Unknown. May not be eligible for pre-disaster mitigation grants. May be eligible for National Fire Plan funding.

5.03 FLOOD

This hazard generally involves a rise in rivers or creeks resulting from heavy rain or rapid melting of the annual snow pack. The Columbia River is located on the northern boundary of Umatilla County and could pose a flood risk if main stem Columbia River Dams were damaged or breached. Major flooding could also result from failure of an irrigation dam on one of the rivers within Umatilla County.

Figure J: 1997 Flood damage on Mill Creek (University of Oregon, Community Planning Workshop)

In addition to floods resulting from man made activities (i.e. failure of dams) Umatilla County has a number of rivers and creeks that have a history of flooding with various threats to public health, safety and investment.

Flood History

Besides the Columbia, the two larger rivers of Umatilla County are the Umatilla River and Walla Walla River. Umatilla County also encompasses a portion of the John Day watershed but very little development impact or natural disaster potential exists along the main stem John Day River system within Umatilla County.

The Umatilla River and Walla Walla River meander directly through 6 of the 12 incorporated cities in Umatilla County and all 12 incorporated cities have frontage on one of Umatilla County's many small and large streams. The Umatilla River, Walla Walla River and their tributaries are the primary flood concerns in Umatilla County.

Worst Floods in Umatilla County[27]

Date of Flood Measurement	Stage (Feet)	Flow (Cubic Feet per Second)
Umatilla River		
December 14, 1882	12.5	17,000
May 30, 1906	12.1	15,500
January 30, 1965	12.1	15,500
February 22, 1949	12.1	15,400
December 12, 1946	11.6	13,700
December 29, 1945	11.6	12,400
January 25, 1975	11.5	14,082
April 1, 1931	11.5	13,500
December 23, 1964	11.4	12,300
February 8, 1997	11.2	13,432
Bank Full Level	6.4	3,380
Flood Stage	7.8	6,139
Walla Walla River		
December 22, 1964	18.9	33,400

[27] "1997 Umatilla County Flood Mitigation Plan," UO Community Planning Workshop, August, 1997 (p. 11).

January 30, 1965	13.7	15,800
January 6, 1969	14.1	14,600
February 12, 1985	15.5	12,200
February 24, 1986	14.9	10,100
Bank Full Level	10.0	3,780
Flood Stage	13.0	7,220

Table 5-2: Worst Floods in Umatilla County

In Addition to the primary streams and their tributaries, Umatilla County is impacted from upland soil erosion, property damage and gravel deposition in the many upland gullies, draws and plateaus during high water/snowmelt events.

Repetitive Loss Structures

While flooding does occur in most parts of Umatilla County, currently, Umatilla County does not have any repetitive loss structures on file. Continued compliance with the FEMA FIRP will assure that Umatilla County continues to prevent structures that could, in the future, be impacted at a repetitive rate.

Existing Flood Protection and Mitigation Activities

Umatilla County Flood Mitigation Plan

After county wide flood events occurred in 1996/1997 Umatilla County was awarded a HUD grant to complete a flood mitigation and outreach plan (Flood Plan). The plan was completed in August of 1997 but many of the identified action items were never pursued or funded. Umatilla County has not experienced other hundred year flood events since the Flood Plan was completed and many of the conditions in Umatilla County have not changed.

Therefore, the action items of the Flood Plan are co-adopted in this Mitigation Plan to again identify potential funding and logistical resources necessary to complete the action items. The Flood Plan is included as Appendix C. Additionally, flood projects have been identified since the adoption of the Flood Plan and are discussed in the action item section below.

United States Army Corps of Engineers

In July of 2000 the United States Army Corps of Engineers (USACE) completed a document entitled “Report of Flood Fight Potential Sites in Umatilla County, Oregon.” The study was updated by USACE July 25, 2000. The original document and revisions are included as Appendix D.

The USACE flood fight study documents flood fight potential and potential mitigation opportunities in areas where USACE may be able to demonstrate economic justification. The study focused primarily on urban infrastructure such as hospitals, water treatment plants and other critical infrastructure as well as residential areas where benefits to more than one or two dwellings may be realized through flood fight and/or mitigation. Many of the mitigation recommendations have been included in the mitigation Action Items of this plan.

Umatilla County Comprehensive Plan and Development Code

The Umatilla County Comprehensive Plan and Development Code implement the policies and laws of the National Flood Insurance Rate Program (NFIP). Chapter 152.350 of the Umatilla County Development Code implements a Flood Hazard (FH) Overlay Zone which limits development within the floodplain and floodway and regulates permitted development based upon NFIP design standards. All parcels within the mapped 100-year flood plain of Umatilla County streams are regulated by the FH Overlay Zone.

NOAA NWS and Umatilla County Emergency Management

The National Weather Service (NOAA NWS) has the ability to predict severe weather events that may trigger prolonged or flash flood events. NOAA NWS is able to issue notices to response agencies and to the public via television, radio, internet and Tone Alert Radios (TARs) when the potential for flooding is likely.

Umatilla County Emergency Management (UCEM) coordinates with NOAA NWS when notices may be required to inform response agencies and the general public of potential flooding events. UCEM response and coordination is outlined in the Umatilla County EOP and usually involves disseminating materials addressing shelter locations, sand bag locations, response contact information and flood fight information. Should a flood event become severe UCEM is capable of activating the EOC and JIC to coordinate flood fights, emergency response, evacuation and the dissemination of important public safety information.

ODOT

ODOT has a “Trip Check” link on its website that provides information to help the public detour away from hazard areas during times of emergency. The “Trip Check” link also has road camera images to inform the public of road conditions prior to making a trip.

Survey Results

Survey results revealed the following mitigation/response tools that may be utilized for wildfire hazard applications:

- ODOT has manpower & equipment dedicated to traffic control and road maintenance
- Rural fire districts can promote public safety through outreach and provide disaster response to protect life and property
- OSP can provide a public safety outreach and also has boats and other resources available during flood events
- OWRD operates and maintains stream gauges that can be used to predict flood events as an advanced warning tool for UCEM and NOAA/NWS
- DOGAMI completes flood stability projects
- Hudson Bay District Improvement Co. Inc. has the only water measurement station on the Walla Walla River within Oregon
- The City of Stanfield is currently doing ditch work and has filed a LOMA with FEMA due to flood mitigation activities inside and outside of its City Limits
- Irrigation districts can help during flood events with sand bagging and equipment use, as well as diversion of water before it reaches populated areas

Flood Action Items (FL)

Flood action items are those activities that pertain to mitigation of flood related hazards in Umatilla County.

ST –FL[28]#1: Seek landowners willing to develop conservation easements and riparian planting within mapped and unmapped flood plain areas.

Ideas for Implementation:

- Map existing, undeveloped flood plain areas where easements and riparian programs could be established without extensive improvements
- Work with conservation groups to identify and establish benefit packages that would encourage landowners to forego development within floodplains
- Attain funding to hire contractors to design and complete riparian buffers and legal formation of easements
- Work with Federal agencies assigned to conservation programs to develop outreach and competitive incentive programs

[28] Short-Term Flood Action Item

- Dedicate funding to on-going operation and maintenance of conservation easements to assure benefits

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	1-5 years
Plan Goals Addressed:	Property Protection, Public Outreach, Planned Prevention, Agency/Citizen Coordination, Natural Resource Protection
Priority :	moderate
Cost/Benefit Outlook:	Good due to minimal implementation and O&M costs. Need to address federal conservation programs and willingness of landowners to participate. Could be more beneficial if tied to re-establishing flood plain function for water quality.

ST –FL #2: Identify areas able to absorb high-velocity stream flows w/o impacting investment (i.e. re-establish or create artificial floodplains). Establish connectivity and diversion infrastructure to be utilized during high water events to divert water to these areas.

Ideas for Implementation:

- Utilize existing information to map test and implementation areas on Umatilla County streams
- Attain funding to hire contractors to design and complete projects
- Work with conservation organizations to design outreach that addresses the multi-beneficial nature of such projects
- Dedicate funding to on-going operation and maintenance of infrastructure to assure benefits

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	1-5 years
Plan Goals Addressed:	Property Protection, Public Outreach, Planned Prevention, Agency/Citizen Coordination, Natural Resource Protection

Priority :	moderate
Cost/Benefit Outlook:	Good due to multi-beneficial nature of project.

ST –FL #3: Develop a database of all landowners within FEMA FIRM designated areas in the county. Use database to distribute outreach and emergency notices related to flooding.

Ideas for Implementation:

- Utilize county GIS department to overlay tax lot information with FEMA flood plain boundaries
- Attain funding to distribute flood outreach information

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	2 years
Plan Goals Addressed:	Public Outreach, Planned Prevention, Agency/Citizen Coordination
Priority :	high
Cost/Benefit Outlook:	Good due to minimal financial need.

LT –FL #1[29]: Identify and map canyons and draws susceptible to high-water and flash flood events but not located on FEMA FIRM Maps. Upgrade Flood Hazard Overlay Zone to limit development within those areas.

Ideas for Implementation:

- Attain funding to assess and map flood prone areas not included in the existing Flood Hazard Overlay Map
- Utilize Comprehensive Plan amendments to include the areas through a public process thereby assuring the chance for public participation

Coordinating Organization:	Umatilla County Planning
Timeline:	5 years

[29] Long-term Flood Action Item

Plan Goals Addressed:	Property Protection, Public Outreach, Planned Prevention, Agency/Citizen Coordination
Priority :	high
Cost/Benefit Outlook:	Depends on public response to new regulatory measures

LT –FL #2: Attain funding to upgrade existing levees and berms to USACE standards to assure continuing flood protection.

Ideas for Implementation:

- Work with USACE to address existing discrepancies and weak spots in the current Umatilla County flood protection system
- Identify most efficient ways to mitigate existing problems
- Attain funding to hire contractors to design and fix problems
- Develop a formal maintenance program to prevent future occurrences of failing flood protection systems

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	5 years
Plan Goals Addressed:	Property Protection, Public Outreach, Planned Prevention, Agency/Citizen Coordination
Priority :	moderate
Cost/Benefit Outlook:	Maintenance may not qualify due to PDMG criteria

LT –FL #3: Identify both public and private bridges that are susceptible to collecting flood debris and exacerbating the problems created by high water events.

Ideas for Implementation:

- Work with USACE to synthesize existing data related to public and private bridges
- Prioritize bridge improvements or replacement utilizing existing, defensible information
- Identify any data gaps or new bridges that need a formal assessment
- Attain funding for cost share or full payment of bridge upgrades or replacement
- Develop ordinances to prevent new bridges that may prevent flood plain protection

Coordinating Organization:	Umatilla County Road Department
Timeline:	5 years
Plan Goals Addressed:	Property Protection, Planned Prevention, Agency/Citizen Coordination, Emergency Service Planning
Priority :	Moderate to High
Cost/Benefit Outlook:	Assessment may not require funding. Some bridges already included in Umatilla County Transportation System Plan. Cost/Benefit unknown until cost of repairs/replacement completed

5.04 SEVERE SUMMER STORMS

A dust storm is a strong, violent wind that carries fine particles such as silt, sand, clay, and other materials, often for long distances. The fine particles swirl around in the air during the storm. A dust storm can spread over hundreds of miles and rise over 10,000 feet. They have wind speeds of at least 25 miles per hour. Dust storms usually arrive with little warning and advance in the form of a big wall of dust and debris. The dust is blinding, making driving safely a challenge. A dust storm may last only a few minutes at any given location, but may often leave serious car accidents in their wake.

The arid regions of Central and Eastern Oregon can experience sudden dust storms on windy days. These are produced by the interaction of strong winds, fine-grained surface material, and landscapes with little vegetation. The winds involved can be as small as "dust devils" or as large as fast moving regional air masses.

Summer Storm History

The following gives a brief description of severe summer storms occurring in the Mid-Columbia area:

May 2, 1843	Mid-Columbia Region Information from the diary of Rev. Gustavus Hines, who was traveling by canoe with a Dr. Davis in the Columbia Gorge
April 21-23, 1931	Mid-Columbia Region Dust from this event blew on an east wind into the Willamette Valley, Central Oregon Region both down the Gorge and over the Cascade Mountains.
May 23, 1975	Near Echo, Oregon Winds up to 45 mph blew dust from nearby plowed fields, resulting in a (Mid-Columbia Region) seven-car accident on a Friday afternoon in the eastbound lanes of Interstate 80 (now I-84), four injured
March 24, 1976	Near Stanfield, Oregon Eighteen vehicles piled-up in two separate accidents on Interstate 80, (Mid-Columbia Region)now I-84; these accidents killed one and injured 20 people; they were caused by a dust storm (referred to in the press as a sand storm) that produced “near zero” visibility; one of the pile-ups was a fiery accident involving a loaded fuel tanker truck, two other trucks, and two cars; this dust storm also caused road closures both south and north of Hermiston, and caused other accidents on Highway 207 about nine miles south of I-80 (84)

July 9, 1979	Near Stanfield;This dust storm caused two deaths and six injuries in a freeway pile-up on I-80 (84) very close to the location of the previous event; winds near 60 mph; some of the injured were hit as pedestrians while trying to assist those already injured or pinned in automobiles
1995	A wind and hail storm in western Umatilla County caused millions of dollars worth of damage to vehicles, structures and crops
Sept. 25, 1999	Near Echo high winds blowing dust set off a chain-reaction of crashes that killed eight people and injured more than twenty. In all, more than forty vehicles crashed in separate pileups in both freeway directions between Hermiston and Pendleton. Parts of Interstate 84 were blocked from mid-morning until nearly midnight. [30]

[30] State of Oregon, Natural Hazards Plan August 2004

NOAA Severe Summer Storm Events 1950-2008

Severe Storm Event History	Hail	Funnel Cloud	Flash Flood	Thunderstorm
Adams				
Athena				
Echo		1		1
Helix	1		1	
Hermiston	1		1	7
Hermiston Airport				1
Indian Lake	1			
Lamb-Weston	1			
Lehman	4			1
Meacham	4			1
Milton Freewater	3	1		
Mission	1			
Pendleton	1	2		1
Pendleton Airport	1			
Pilot Rock	4	1	1	
Stanfield	2			1
Tollgate	6			
Ukiah	8			
Umatilla				4
Umapine	1			
Weston	1	1		1
County (unspecified)	7			10
	47	6	3	29

Table 5-3: NOAA Severe Summer Storm Events 1950-2008

Existing Summer Storm Protection and Mitigation Activities

Summer storms may impact existing above ground infrastructure and structures. In Umatilla County most of the damage resulting from summer storms occurs when motorists interact with the hazard event. Therefore, aside from some structural standards and response from power and transmission companies the bulk of the mitigation activities deal with advanced warning to the public.

NOAA NWS

NOAA NWS has the potential to issue severe weather warnings including dust storms in Umatilla County. These warnings can be disseminated via radio, television, internet and TARs. These warnings can then be utilized by UCEM, ODOT and local response agencies to warn the public and prepare for emergency response.

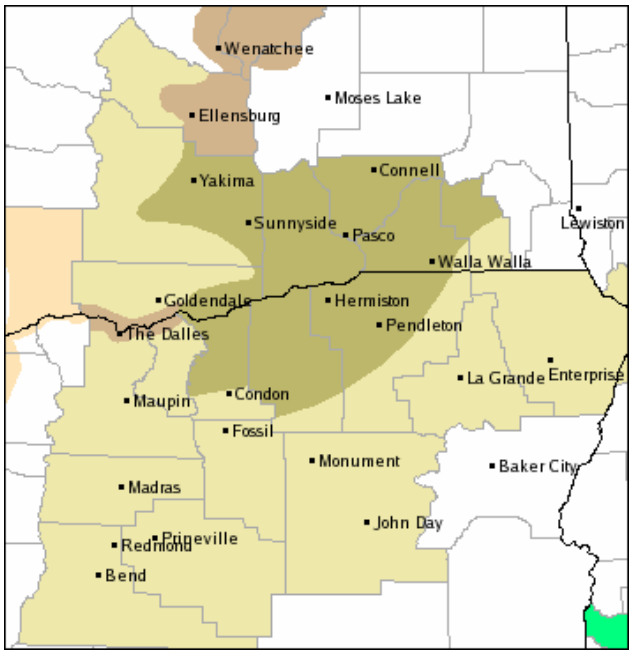

Figure K: Severe Weather Outlook and Blowing Dust Warning (NOAA NWS)[31]

UCEM

Once UCEM receives warning of a potential dust storm they can utilize the JIC to inform response agencies and the general public of the threat. UCEM can utilize the same information sources that NOAA NWS utilizes for emergency alerts, but can also utilize amateur radio operators, road reader boards and the emergency communications systems currently set up to deal with a chemical emergency that may occur at the Umatilla Chemical Depot. UCEM can also coordinate with 911 dispatch and other response agencies to prepare for emergency situations and may activate the EOC if conditions warrant.

Conservation Reserve Program (CRP)

CRP is a federal program that converts eligible cropland from agricultural production and plants the land to permanent grass cover that reduces erosion and benefits wildlife populations. CRP establishes permanent cover that reduces windblown dust and has been effective in reducing soil erosion in the areas most prone to wind erosion. In Umatilla County, NRCS has designated an area near I-84 as a wind erosion priority area to influence enrollment into the Conservation Reserve Program (CRP).

No-Till Cropping

[31] http://www.wrh.noaa.gov/pdt/

SWCDs have been actively promoting direct seeding technology through education and incentives. Direct seeding or no-till cropping systems utilize technologically advanced equipment that places seed and fertilizer into undisturbed soil and residue from the previous crop. This results in minimal soil disturbance and reduced potential for wind and water erosion. Research on the Columbia Plateau has demonstrated that continuous annual no-till cropping can significantly reduce predicted dust emissions during severe winds.

The research shows that continuous annual no-till cropping can reduce predicted dust emissions by 94% during severe wind events, compared to conventional wheat-fallow. Research continues on measuring dust emissions from fields on the Columbia Plateau, a 50,000 square-mile region in Washington, Oregon, and Idaho containing one of the driest, yet most productive, rain-fed wheat regions in the world. [32]

Soil and Water Conservation District Direct Seed (No-Till) Applications for 2004

Direct Seed Applicant Information for Fall 2004			
City	**Township**	**Range**	**Section #'s**
Pilot Rock	1S	31E	13,19,20
Pendleton	***3N***	***32E***	***18***
Pilot Rock	1S	33E	12
Pendleton	3N	32E	33,54
Pendleton	2N	32E	32,15
Milton-Freewater			
Pendleton	3N	33E	
Pendleton	***3N***	***32E***	***7,18***
Pendleton	3N,4N	30E	3,34
Adams	4N	33E	36
Pendleton			
Pilot Rock			
Pilot Rock	1N	32E,31 E	19,20,21
Helix	***5N***	***33,34***	
Pendleton	***1N***	***32E***	***30***
Adams			
Athena	***3N***	***35E***	***3,4***
Helix			
Helix			
Pendleton	4N	31E	16,21
Pendleton	***3N***	***32E,31 E***	***1,6***
Helix	5N	33E	21

[32] http://www.csrees.usda.gov/nea/nre/sri/air_sri_dust.html

Pendleton	***4N***	***33E***	***11,12***
Helix	***4N***	***32E***	
Adams	2N	33E	1,2
Pendleton	1N	33E	8
Athena	4N	34E	16
Athena	4N	34E	7,8
Athena	4N	29E	8,9
Pendleton	2N	32E	32
Pendleton	3N	32E	5,6
Pendleton			
Athena	3N,4N	33E,35 E	1;29-32
Helix	***5N***	***32E***	***32,34***
Pendleton	3N	32E	19
Athena	***6N***	***32E***	***28,33***
Pendleton	2N	33E	34
Milton-Freewater			
Pendleton	***1N***	***32E***	***29,32***
Pendleton	***32E***	***7***	
Helix	***5N***	***32E***	***15***
Pendleton	4N	31E	9,10
Pendleton	4N	31E	16
Pilot Rock	1S	32E	6
Pilot Rock			
Helix	6N	32E	21,28
Pendleton	***3N***	***32E***	***6,7***

Table 5-4: Soil and Water Conservation District Direct Seed (No-Till) Applications for 2004 (Jaime Clarke, Umatilla County Soil and Water Conservation District).

No-till only works for some crops under certain conditions and even in situations where it does work, some farmers find that they need to till the soil periodically to reduce diseases and redistribute soil moisture.

Wind Erosion Hazard Index

Representatives from the Agricultural Research Service, located at the Columbia Plateau Conservation Research Center in Pendleton, collaborated with the staff from the National Weather Service to develop a wind erosion hazard index to improve dust storm prediction models used in forecasting weather conditions that could lead to dust storms. In the future, this information could lead to a more advanced warning system for the public and emergency responders.

Real-Time Video[33]

ODOT has installed a microwave system and roadside camera tower near the Lorenzen Road Interchange ten miles west of Pendleton. The microwave and

[33] State of Oregon, Emergency Management Plan – Volume II, http://www.oregon.gov/OOHS/OEM/docs/library/or_emp_volum_2_emerg_oper.pdf

camera structures are located south of the freeway, opposite the Rew Grain Elevator. Two cameras are currently mounted on a metal tower next to the microwave tower. One provides a snapshot of the freeway and is posted on the "TripCheck" Web site. The other camera provides a real-time image, viewed by ODOT District 12 office personnel only. A weather station and visibility meter have also been added to the camera tower to monitor blowing dust conditions during high winds. The real-time camera can be panned and tilted to check eastbound and westbound traffic as well as scan the nearby fields.

ODOT Highway Advisory Radio

Three transmitters have been installed for Highway Advisory Radio along Interstate 84 in Morrow and Umatilla counties: one at the Boardman Safety Rest Area, another at the District 12 maintenance station, and the third near Mission. When an emergency occurs, the ODOT District 12 office selects the appropriate pre-recorded message on the system and transmits it via radio. At the same time, ODOT activates yellow flashing beacons. Motorists seeing the signs and flashing lights can tune to the appropriate radio station to hear the messages.

Also installed in the system is the ability to re-broadcast National Weather Service (NWS) weather information. NWS Weather Radio is re-broadcast on a continuous basis unless there is an emergency. An emergency broadcast then overrides the Weather Radio service.

Restricted Access to Interstate 84 during Hazardous Conditions

ODOT has installed two gates for I-84 closures. The gates were funded by CSEPP. The gates are at on-ramps at the eastbound I-84 on-ramp at exit 165 (Port of Morrow, just east of Boardman) and the westbound on-ramp at exit 202 (Barnes Road, just west of Pendleton). State and local law enforcement officers and ODOT highway workers can close the gates, restricting access to I-84 due to hazardous dust conditions or other situations that make highway travel dangerous.

Survey Results
No additional tools were identified by collected surveys

Summer Storm (SS) Action Items

ST –SS[34] #1: Complete necessary tasks to obtain a NOAA NWS Storm Ready rating

Ideas for Implementation:

- Establish or verify a 24 hour warning point or emergency operations center
- Verify more than one way to receive severe weather warnings and broadcast them to the public
- Create a system that monitors weather locally
- Promote the importance of public readiness through seminars
- Develop a formal hazardous weather plan, including the training and activation of weather spotters and annual emergency exercises

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	1-2 years
Plan Goals Addressed:	Property Protection, Planned Prevention, Agency/Citizen Coordination, Emergency Service Planning
Priority :	High
Cost/Benefit Outlook:	Good due to minimal costs necessary to implement

LT –SS #1[35]: Identify opportunities to advance NOAA NWS warning coverage via wireless and non-wireless infrastructure

Ideas for Implementation:

- Utilize existing NOAA NWS service maps to identify areas where infrastructure is necessary
- Identify public lands or landowners willing to allow infrastructure development

[34] Short-Term Summer Storm Action Item
[35] Long-Term Summer Storm Action Item

- Attain funding to complete necessary feasibility and environmental assessments
- Attain funding for construction and identify funding sources for long-term operation and maintenance to assure benefits

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	5 years
Plan Goals Addressed:	Property Protection, Planned Prevention, Agency/Citizen Coordination, Emergency Service Planning
Priority :	High
Cost/Benefit Outlook:	Construction costs must be considered before an accurate Cost/Benefit ratio could be established

LT –SS #2: Implement a Tone Alert Radio program to provide Tone Alert Radios to all schools, communications stations and other interested private and public entities to increase advanced warning capabilities of NOAA NWS and UCEM

Ideas for Implementation:

- Utilize existing NOAA NWS service maps to identify areas where TARs could assist advanced warning capability
- Identify stakeholders willing to participate in the program
- Attain funding to purchase and distribute TARs and conduct training
- Complete a public outreach campaign to demonstrate the effectiveness of TARs if used properly

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	5 years

Plan Goals Addressed:	Property Protection, Planned Prevention, Agency/Citizen Coordination, Emergency Service Planning
Priority :	Moderate
Cost/Benefit Outlook:	Unknown until needs assessment completed. Cost share by stakeholders may assist in attaining necessary funding

5.05 SEVERE WINTER STORM

Winter storms generally involve severe snow and ice storms which can result in power outages and disrupt transportation. The characteristics of weather hazards are determined by a variety of meteorological factors such as amount of snow or rainfall, air temperature, wind velocity and temperature, ground saturation or snow-pack conditions. Some areas of Umatilla County are also subject to risk from avalanche; however these areas are primarily in the high country of the Blue Mountains and pose minimal risk to most of the population or investments.

Heavy snow or rainfall coupled with high winds can cripple most of the communities and impact natural resources. The Blue Mountains experience the most snowfall in the county, snowfall averages 6-8' per year at the higher elevations.

Freezing rain and fog plagues the entire county most of the winter but concentrates most heavily along the foothills from Pilot Rock heading northeast toward Milton Freewater. Storms systems tend to move east-northeast impacting the communities of Pilot Rock, Pendleton, Adams, Helix, Athena, Weston and Milton Freewater. Interstate 84 runs east-west through this area and is closed to all through traffic several times per year. Interstate I-82 which runs north south parallel to Hermiston, Stanfield and Umatilla experiences significant traffic problems when hit with freezing rain. Finally, State Highway 11 which running east/west is shut down frequently during the year for auto accidents caused by icy roads.

Rain on snow weather events create conditions which impact water quality conditions, severe soil erosion, destroys crops and create mud flows that chokes streams, culverts, bridges and block roads. Particularly the cropland surrounding Pendleton and extending through the foothill area are impacted. When the ground is frozen and covered with snow and a warmer wet air mass moves through soil moves off cropland and into streams and roads.

Several small towns and rural areas are more susceptible to environmental and structural damage from sever winter storms.

Blue Mountains – in the past ten years, the Blue Mountains have experienced wind damage that has impacted the forest and structures in the wild land interface. The development of micro bursts creates dramatic damage in a small area. Hundreds of acres of private and public forest has been blown over at the root or snapped off in the middle. Oregon State Highway 204 between Weston and Elgin is closed annually by fallen trees blocking traffic.

Pilot Rock – The City of Pilot Rock lies at the base of the Blue Mountains ten miles due south of Pendleton. Its location in the foothills of the Blue Mountains subjects it to strong south winds created by moving storm fronts.

Umatilla/Hermiston/Stanfield – The closeness to the Columbia River provides a conduit for high winds, microbursts and small tornados. The Stanfield area along Interstate I-84 has been the scene of multiple fatality car accidents in 1976, 1979 and 1999.

Severe Winter Storms - Data by NOAA national Climatic Data Center

Zone	Date	Weather	Locations
44	Jan 23 2000	Heavy Snow - 4"	Hermiston, Stanfield
	Nov 24 2000	Snow and Ice	Umatilla
	Jan 06-07 2004	Heavy Snow -6"	Umatilla, Stanfield, Hermiston, Echo
	Jan 08-09 2004	Freezing Rain/Ice	Umatilla, Stanfield, Hermiston, Echo
	Dec 08 2005	Extreme Cold	Umatilla, Stanfield, Hermiston, Echo
	Jan 15 2005	Snow and Sleet	Umatilla, Stanfield, Hermiston, Echo
	Jan 17-18 2005	Freezing Rain/Ice	Umatilla, Stanfield, Hermiston, Echo
	Jan 26-27 2008	Heavy Snow - 6"	Umatilla, Stanfield, Hermiston, Echo
501	Nov 28 2007	Heavy Snow 4"-18"	Pendleton, Helix, Pilot Rock, Weston, Athena, Adams, Milton Freewater
	Dec 06 2007	Heavy Snow 4'-6"	Pendleton, Helix, Pilot Rock, Weston, Athena, Adams, Milton Freewater
	Jan 26-27 2008	Heavy Snow 6" - 9"	Pendleton, Helix, Pilot Rock, Weston, Athena, Adams, Milton Freewater
502	Mar 01 2007	Heavy Snow 6"-16"	Tollgate, Meacham
	Dec 19 2007	Heavy Snow 10"-12"	Tollgate
	Dec 26 2007	Heavy Snow 8' - 10"	Tollgate, Meacham
	Dec 27-28 2007	Heavy Snow 8" - 12"	Tollgate, Meacham
	Jan 08-09 2008	Heavy Snow 8" - 10"	Tollgate, Meacham
	Jan 19 2008	Heavy Snow 8" - 10"	Tollgate, Meacham
	Jan 26-27 2008	Heavy Snow 6" - 14"	Tollgate, Meacham
503	Jan 27 2008	Heavy Snow 6" - 8"	Ukiah
	Jan 08-09 2008	Heavy Snow 8" - 10"	Ukiah

Table 5-5: Severe Winter Storms - Data by NOAA national Climatic Data Center

Zone 044 - Northwest section of the county. Communities in this public forecast zone are City of Umatilla, Stanfield, Hermiston and Echo

Zone 501 – Center section of the county near the foothills of the Blue Mountains. Communites include Pendleton, Helix, Pilot Rock, Adams, Athena, Weston and Milton Freewater.

Zone 502 – Northeast section of the county, primarily located in the Blue Mountains. The small communities of Tollgate and Meacham are located in this area.

Zone 503 – Southeast section of the county, primarily located in the Blue Mountains. The community of Ukiah is located in this zone.

Existing Winter Storm Response and Mitigation Activities

Winter storms may impact existing above ground infrastructure and structures. In Umatilla County most of the damage resulting from winter storms occurs when motorists interact with the hazard event. Therefore, aside from some structural standards and response from power and transmission companies the bulk of the mitigation activities deal with advanced warning to the public.

NOAA NWS

NOAA NWS has the potential to issue severe weather warnings including dust storms in Umatilla County. These warnings can be disseminated via radio, television, internet and TARs. These warnings can then be utilized by UCEM, ODOT and local response agencies to warn the public and prepare for emergency response. Currently NOAA NWS can not serve the entire county and must construct new infrastructure to be able to provide all portions of the county with advanced warning

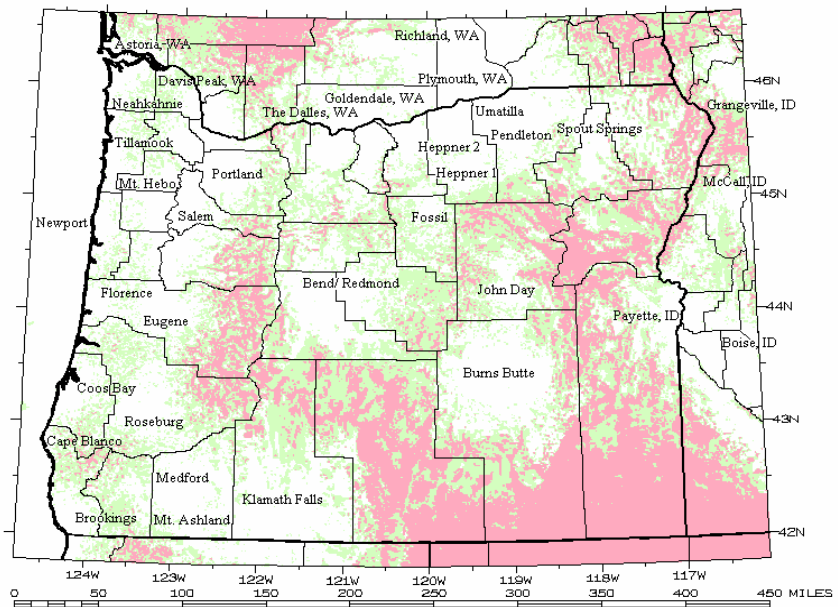

Figure L: NOAA NWS Weather Warning Coverage (NOAA NWS)

UCEM

Once UCEM receives warning of a potential winter storm they can utilize the JIC to inform response agencies and the general public of the threat. UCEM can utilize the same information sources that NOAA NWS utilizes for emergency alerts, but can also utilize amateur radio operators, road reader boards and the emergency communications systems currently set up to deal with a chemical emergency that may occur at the Umatilla Chemical Depot. UCEM can also coordinate with 911 dispatch and other response agencies to prepare for emergency situations and may activate the EOC if conditions warrant.

Real-Time Video, "Trip Check" Cameras and Weather Outlooks[36]

ODOT has installed a microwave system and roadside camera tower near the Lorenzen Road Interchange ten miles west of Pendleton. The microwave and camera structures are located south of the freeway, opposite the Rew Grain Elevator. Two cameras are currently mounted on a metal tower next to the microwave tower. One provides a snapshot of the freeway and is posted on the "Trip Check" Web site. The other camera provides a real-time image, viewed by ODOT District 12 office personnel only. A weather station and visibility meter have also been added to the camera tower to monitor blowing dust conditions during high winds. The real-time camera can be panned and tilted to check eastbound and westbound traffic as well as scan the nearby fields.

[36] State of Oregon, Emergency Management Plan – Volume II, http://www.oregon.gov/OOHS/OEM/docs/library/or_emp_volum_2_emerg_oper.pdf

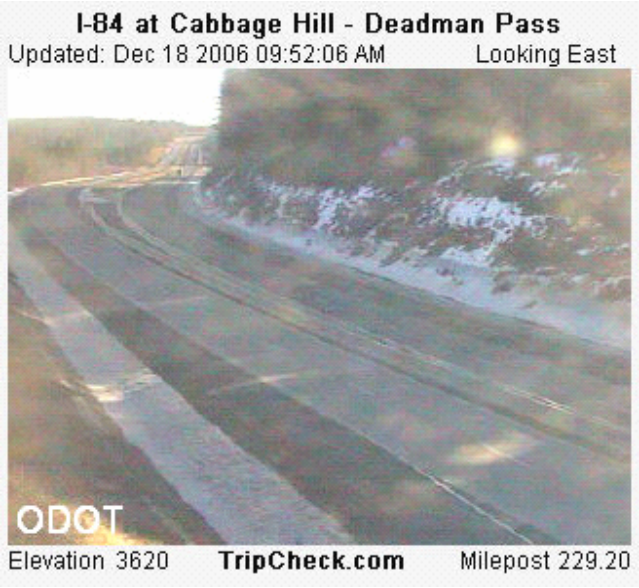

Figure M: ODOT Trip Check Camera at Deadman's Pass (ODOT)[37]

ODOT also has "Trip Check" weather cameras at Battle Mountain, Pendleton, Deadman's Pass and Meacham. In addition to the cameras, ODOT has site specific road conditions on the "Trip Check" website that can be utilized by the public to monitor road conditions 24 hours a day.

ODOT Highway Advisory Radio

Three transmitters have been installed for Highway Advisory Radio along Interstate 84 in Morrow and Umatilla counties: one at the Boardman Safety Rest Area, another at the District 12 maintenance station, and the third near Mission. When an emergency occurs, the ODOT District 12 office selects the appropriate pre-recorded message on the system and transmits it via radio. At the same time, ODOT activates yellow flashing beacons. Motorists seeing the signs and flashing lights can tune to the appropriate radio station to hear the messages.

Also installed in the system is the ability to re-broadcast National Weather Service (NWS) weather information. NWS Weather Radio is re-broadcast on a continuous basis unless there is an emergency. An emergency broadcast then overrides the Weather Radio service.

Restricted Access to Interstate 84 during Hazardous Conditions

ODOT has installed two gates for I-84 closures. The gates were funded by CSEPP. The gates are at on-ramps at the eastbound I-84 on-ramp at exit 165 (Port of Morrow, just east of Boardman) and the westbound on-ramp at exit 202 (Barnes Road, just west of Pendleton). State and local law enforcement officers

[37] http://www.tripcheck.com/Pages/RCMap.asp?mainNav=RoadConditions&curRegion=3

and ODOT highway workers can close the gates, restricting access to I-84 due to hazardous conditions or other situations that make highway travel dangerous.

Survey Results
No additional tools were identified by collected surveys

Winter Storm (WS) Action Items

ST –WS[38] #1: Complete necessary tasks to obtain a NOAA NWS Storm Ready rating

Ideas for Implementation:

- Establish or verify a 24 hour warning point or emergency operations center
- Verify more than one way to receive severe weather warnings and broadcast them to the public
- Create a system that monitors weather locally
- Promote the importance of public readiness through seminars
- Develop a formal hazardous weather plan, including the training and activation of weather spotters and annual emergency exercises

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	5 years
Plan Goals Addressed:	Property Protection, Planned Prevention, Agency/Citizen Coordination, Emergency Service Planning
Priority :	High
Cost/Benefit Outlook:	Good due to minimal costs necessary to implement

LT –WS[39] #1: Identify opportunities to advance NOAA NWS warning coverage via wireless and non-wireless infrastructure

[38] Short-Term Winter Storm Action Item

[39] Long-Term Winter Storm Action Item

Ideas for Implementation:

- Utilize existing NOAA NWS service maps to identify areas where infrastructure is necessary
- Identify public lands or landowners willing to allow infrastructure development
- Attain funding to complete necessary feasibility and environmental assessments
- Attain funding for construction and identify funding sources for long-term operation and maintenance to assure benefits

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	5 years
Plan Goals Addressed:	Property Protection, Planned Prevention, Agency/Citizen Coordination, Emergency Service Planning
Priority :	High
Cost/Benefit Outlook:	Construction costs must be considered before an accurate Cost/Benefit ratio could be established

LT –WS #2: Implement a Tone Alert Radio program to provide Tone Alert Radios to all schools, communications stations and other interested private and public entities to increase advanced warning capabilities of NOAA NWS and UCEM

Ideas for Implementation:

- Utilize existing NOAA NWS service maps to identify areas where TARs could assist advanced warning capability
- Identify stakeholders willing to participate in the program
- Attain funding to purchase and distribute TARs and conduct training
- Complete a public outreach campaign to demonstrate the effectiveness of TARs if used properly

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	5 years
Plan Goals Addressed:	Property Protection, Planned Prevention, Agency/Citizen Coordination, Emergency Service Planning
Priority :	Moderate
Cost/Benefit Outlook:	Unknown until needs assessment completed. Cost share by stakeholders may assist in attaining necessary funding

LT –WS #3: Assess snow removal capabilities of Umatilla County. Providing funding for snow removal equipment in areas with minimal or no snow removal capabilities.

Ideas for Implementation:

- Work with ODOT, county, city and special district personnel to catalogue the amount and quality of snow removal equipment
- Attain funding to cost share or pay for additional snow removal equipment where existing capabilities prove to be inadequate

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	5 years
Plan Goals Addressed:	Property Protection, Planned Prevention, Agency/Citizen Coordination, Emergency Service Planning
Priority :	Moderate
Cost/Benefit Outlook:	Poor due to high cost of equipment and difficulty of quantifying benefits

5.06 EARTHQUAKE

Background

Earthquakes are created by tectonic movement within the earth's crust. This movement is manifested as localized ground shaking with possible soil liquefaction. After the initial seismic event, tremors or aftershocks can occur for an extended period of time resulting in continued structural damage. There are five main categories of hazards associated with earthquakes. These hazards include shaking, differential settlement, fault displacement, landslides, and seiches.

There have been nearly 100 earthquakes in the Columbia Basin over the last 95 years. Fortunately, most have been minor. The largest recorded earthquake registered 6.1 in the City of Athena in 1936. Almost all of the earthquake epicenters have been in or near population centers and McNary, McKay and Cold Springs Dams.

There are several known fault lines throughout Umatilla County with further geological analyses ongoing. An earthquake measuring 5.8 occurred in July 1936 and caused damage throughout the county, especially in the Milton-Freewater area. This earthquake was associated with the 845c Hite fault system.

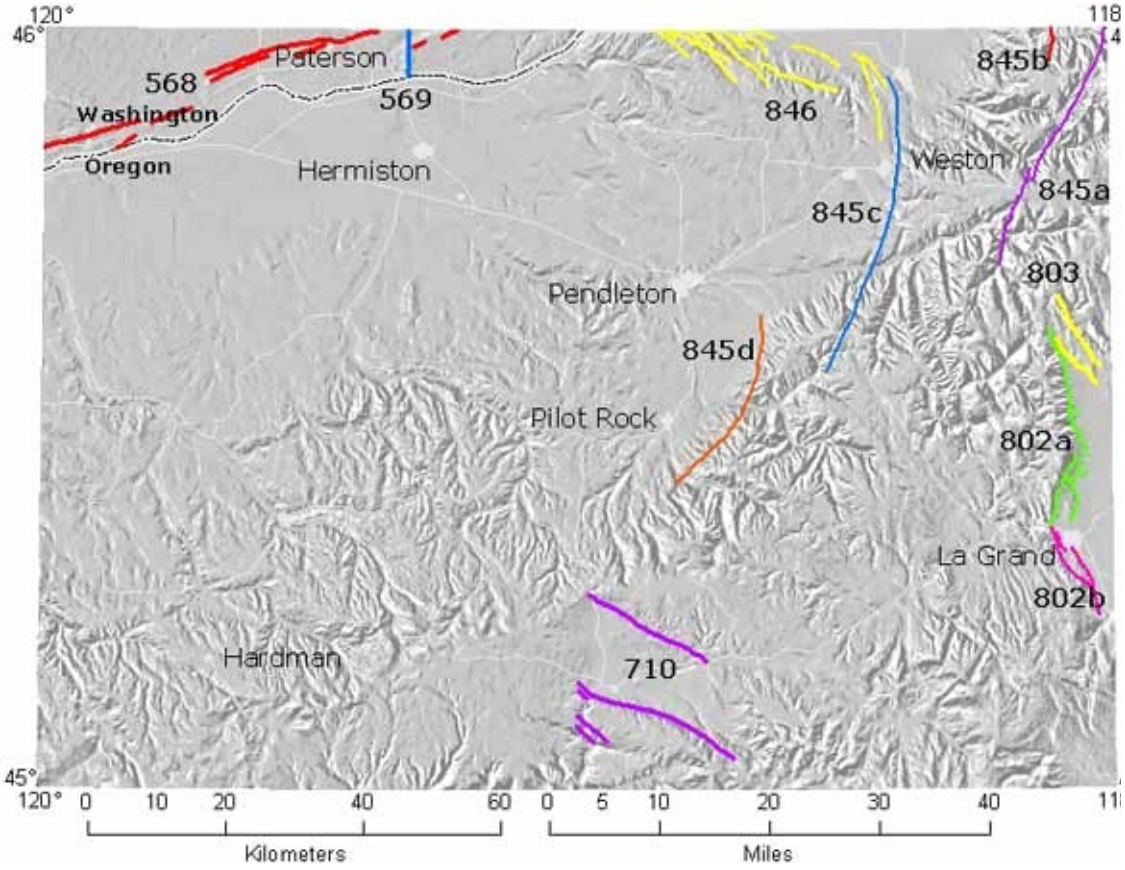

Figure N: Earthquake Map of Umatilla County

Fault Number and Name

568 Columbia Hills Structures 569 Unnamed fault north of Service Anticline 710 Ukiah Valley faults 802a West Grande Ronde Valley fault zone, Mount Emily section 802b West Grande Ronde Valley fault zone, La Grande section 803 East Grande Ronde Valley fault zone 845a Hite fault system, Hite section 845b Hite fault system, Kooskooskie section 845c Hite fault system, Thorn Hollow section 845d Hite fault system, Agency section 846 Wallula fault system

Earthquake History

Multiple small and large earthquakes have been recorded in Umatilla County. A damaging earthquake occurred at 11:08 PM PST on July 15, 1936, near the State line between Milton-Freewater, Oregon, and Walla Walla, Washington. The magnitude 5.75 shock affected an area of about 272,000 square kilometers in the two States and adjacent Idaho. Ground cracking was observed about 6.5 kilometers west of Freewater, and there were marked changes in the flow of well water (VII). Many chimneys were damaged at the roof level in Freewater; in addition, plaster was broken, and walls cracked. Similar damage was reported from Umapine. Total damage amounted to $100,000. There were numerous

aftershocks up to November 17; more than 20 moderate shocks occurred during the night, and stronger ones were felt (V) on July 18 and August 4 and 27.[40]

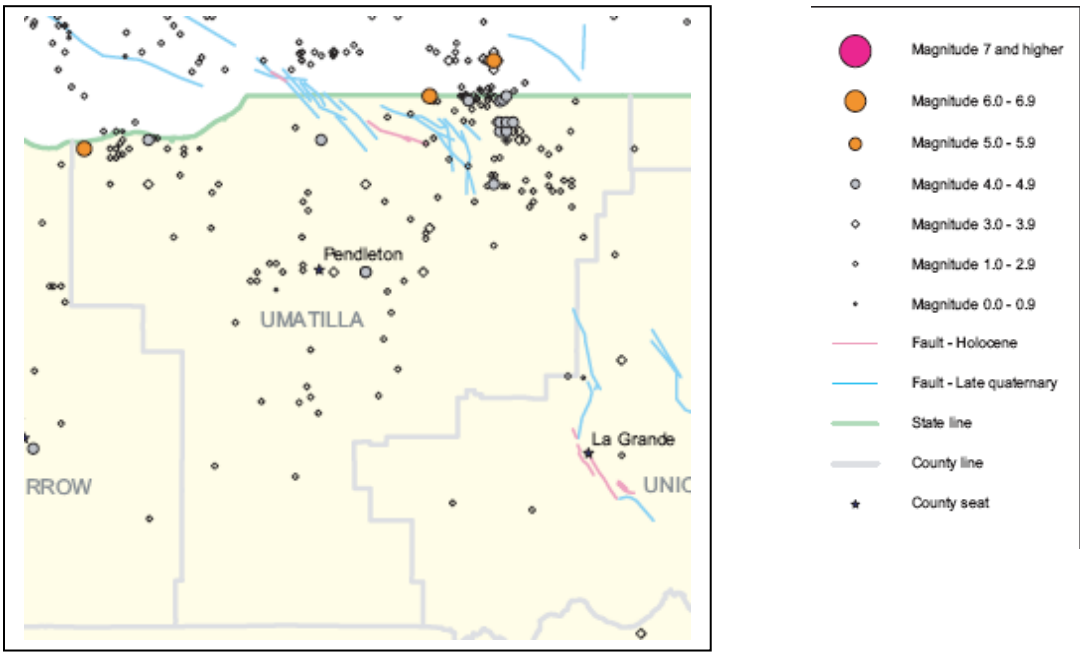

Figure O: Earthquake History in Umatilla County (DOGAMI)

Existing Earthquake Response and Mitigation Activities

UCEM

Two employees of UCEM are certified to asses the structural integrity of buildings within the county. Based upon these assessments UCEM can recommend retrofit techniques to make the structures more resistant to earthquake damage. These employees can also identify potential funding sources to assure completion of retrofit activities.

Oregon State Building Codes

New Construction: The Oregon Structural Specialty Code, based on 2004 additions to the 2003 IBC, designates Umatilla County as a Seismic Design Category C. According to a local Building Official, Seismic Design Category C is the least restrictive design category of the Oregon Structural Specialty Code with a seismic design category determination of C=0.331<5ds=0.50g.[41]

Earthquake Vulnerability Assessment

[40] United States Geological Survey, http://earthquake.usgs.gov/regional/states/oregon/history.php
[41] Oral communication with Brett Cook, Building Official, City of Boardman on 01/10/06

In 2007 the Oregon Department of Geology and Mineral Industries for the Oregon Legislature conducted a STATEWIDE SEISMIC NEEDS ASSESSMENT: IMPLEMENTATION OF OREGON 2005 SENATE BILL 2 RELATING TO PUBLIC SAFETY, EARTHQUAKES, AND SEISMIC REHABILITATIONOF PUBLIC BUILDINGS. The public buildings included in the survey are schools, community colleges, fire stations, hospitals, and police stations.

The information is available within the study for all of the sites in Umatilla County. The following tables display the results from assessments made in Umatilla for public schools, Blue Mountain Community College and some fire department buildings.

Umatilla County
Earthquak Vulnerability Assessment

District	Facility Name	Collapse Potential
Hermiston	Highland Hills Elementary School	2.6 Low (<1%)
	Highland Hills Elementary School	2.6 Low (<1%)
	Highland Hills Elementary School	0.3 High (>10%)
	Rocky Heights Elementary School	(0.1) Very High (100%)
	Rocky Heights Elementary School	(0.1) Very High (100%)
	Sandstone Middle School	Low (<1%)
	Sunset Elementary School	0.3 High (>10%)
	Sunset Elementary School	2.6 Low (<1%)
	Sunset Elementary School	2.6 Low (<1%)
	Sunset Elementary School	2.6 Low (<1%)
	West Park Elementary School	(0.1) Very High (100%)
	West Park Elementary School	2.4 Low (<1%)
	West Park Elementary School	2.4 Low (<1%)
	West Park Elementary School	1.7 Moderate (>1%)
	Armand Larive Middle School	(0.1) Very High (100%)
	Armand Larive Middle School	(0.1) Very High (100%)
	Armand Larive Middle School	0.3 High (>10%)
	Armand Larive Middle School	0.3 High (>10%)
	Armand Larive Middle School	0.3 High (>10%)
	Desert View Elementary School	Low (<1%)
Pendleton	Lincoln Primary School	0.7 High (>10%)
	Lincoln Primary School	1.8 Moderate (>1%)
	Lincoln Primary School	5.9 Low (<1%)
	McKay Creek Elementary School	0.5 High (>10%)
	McKay Creek Elementary School	2.1 Low (<1%)
	Pendleton High School	0.3 High (>10%)
	Pendleton High School	(0.1) Very High (100%)
	Pendleton High School	0.8 High (>10%)

	Pendleton High School	0.3 High (>10%)
	Pendleton High School	0.3 High (>10%)
	Sherwood Heights Elementary Sc	1.1 Moderate (>1%)
	Sherwood Heights Elementary Sc	1.1 Moderate (>1%)
	Sherwood Heights Elementary Sc	1.1 Moderate (>1%)
	Sherwood Heights Elementary Sc	1.1 Moderate (>1%)
	Sherwood Heights Elementary Sc	2.9 Low (<1%)
	Sunridge Middle School	1.1 Moderate (>1%)
	Washington Elementary School	(0.9) Very High (100%)
	Washington Elementary School	5.0 Low (<1%)
	Washington Elementary School	0.3 High (>10%)
	West Hills Intermediate	0.3 High (>10%)
	West Hills Intermediate	2.8 Low (<1%)
Umatilla	Clara Brownell Middle School	0.3 High (>10%)
	Clara Brownell Middle School	0.3 High (>10%)
	McNary Heights Elementary Scho	(0.1) Very High (100%)
	Umatilla High School Moderate	Low (<1%)
Stanfield	Stanfield Elementary School	Low (<1%)
	Stanfield Secondary School	2.7 Low (<1%)
Pilot Rock	Pilot Rock Elementary School	3.1 Low (<1%)
	Pilot Rock Elementary School	3.6 Low (<1%)
	Pilot Rock Elementary School	1.1 Moderate (>1%)
	Pilot Rock Elementary School	1.1 Moderate (>1%)
	Pilot Rock High School	1.0 High (>10%)
	Pilot Rock High School	0.5 High (>10%)
	Pilot Rock High School	1.1 Moderate (>1%)
	Pilot Rock High School	1.1 Moderate (>1%)
	Pilot Rock High School	1.1 Moderate (>1%)
Milton Freewater	Central Middle School	1.7 Moderate (>1%)
	Central Middle School	(0.1) Very High (100%)
	Central Middle School	1.9 Moderate (>1%)
	Central Middle School	(0.1) Very High (100%)
	Ferndale Elementary School	(0.1) Very High (100%)
	Ferndale Elementary School	0.3 High (>10%)
	Ferndale Elementary School	0.3 High (>10%)
	Freewater Elementary School	0.2 High (>10%)
	Freewater Elementary School	(0.5) Very High (100%)
	Freewater Elementary School	0.4 High (>10%)
	Grove Elementary School	0.6 High (>10%)
	Grove Elementary School	0.3 High (>10%)
	Grove Elementary School	0.3 High (>10%)

	McLoughlin High School	0.2 High (>10%)
	McLoughlin High School	0.0 Very High (100%)
	McLoughlin High School	0.0 Very High (100%)
	McLoughlin High School	2.0 Moderate (>1%)
	McLoughlin High School	Very High (100%)
	McLoughlin High School	Moderate (>1%)
Helix	Helix School	High (>10%)
	Helix School	High (>10%)
	Helix School	Low (<1%)
	Helix School	High (>10%)
Echo	Echo School	High (>10%)
	Echo School	High (>10%)
	Echo School	High (>10%)
	Echo School	High (>10%)
	Echo School	Low (<1%)

Individual Building	**Collapse Potential**
Community College	
Blue Mountain - Pendleton - McCrae Activity Center	Moderate (>1%)
Blue Mountain - Pendleton - Morrow Hall	Moderate (>1%)
Blue Mountain - Pendleton - Pioneer Hall	Moderate (>1%)
Blue Mountain - Pendleton - Science and Technology	Low (<1%)
Blue Mountain - Pendleton - Umatilla Hall	Moderate (>1%)
Fire Districts	
East Umatilla County RFPD	Low (<1%)
East Umatilla County RFPD	Low (<1%)
East Umatilla County RFPD	High (>10%)
East Umatilla County RFPD	Moderate (>1%)
Pendleton City Fire	High (>10%)
Pilot Rock RFPD	2.7 Low (<1%)
St. Anthony Hospital	High(>10%)
Good Shepherd Building 1	High(>10%)
Good Shepherd Building 2	V.High (100%)

Table 5-6: Umatilla County Eearthquak Vulnerability Assessment

City Hazard Analysis

The table below identifies earthquake hazards and their rankings for the individual cities. The same methodology was used for ranking as utilized in the risk assessment. Local information was included into the rankings to provide a realistic view of the hazard. The cities of Adams, Helix and Milton-Freewater were the only towns to list earthquake as a hazard of concern. It should be noted all three of these towns are located near the Hite Fault System described above.

City Hazard Analysis (Eearthquake) Ranking

Hazard	History	Vulnerability	Maximum Threat	Probability
City of Adams				
Earthquake	Low	High	High	High
City of Helix				
Earthquake	High	Low	Low	Low
City of Miton-Freewater				
Earthquake	Low	High	High	Moderate

Table 5-7: City Hazard Analysis (Earthquake) Rnaking

EarthQuake (EQ) Action Items

ST –EQ [42]#1: Complete a county wide assessment of structures vulnerable to earthquake damage. Attain funding to retro-fit high priority structures

Ideas for Implementation:

- Utilize certified individuals to assess and map vulnerable structures in rural and incorporated areas of Umatilla County
- Assess retro-fit costs on identified structures
- Attain funding for the design and construction of retro-fit projects

[42] Short-Term Earthquake Action Item

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	1 year (Assessment) Ongoing (Retro-Fit Construction)
Plan Goals Addressed:	Property Protection, Planned Prevention, Agency/Citizen Coordination, Emergency Service Planning
Priority :	High
Cost/Benefit Outlook:	Funding for assessment outlook is good. Funding for retro-fit projects depends upon the functional classification and use of each structure.

LT –EQ[43] #1: Support continuing work to identify all fault patterns in Umatilla County

Ideas for Implementation:

- Support efforts to attain funding to complete geo-referenced fault maps of the county
- Overlay property ownership on fault maps to help in outreach efforts

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	Ongoing
Plan Goals Addressed:	Property Protection, Planned Prevention, Agency/Citizen Coordination
Priority :	Moderate
Cost/Benefit Outlook:	DOGAMI working to complete this action item

[43] Long-Term Earthquake Action Item

5.07 VOLCANO

Background and History
On May 18, 1980 Mount St. Helens erupted with a major lateral blast that claimed several lives and forever changed the landscape around the Mountain. While Mount St. Helens is more than 200 miles from Umatilla County it remains a potential hazard that could effect the lives of residents of Umatilla County.

Volcanic eruptions are random events, while the likely hood of an eruption can be predicted, the exact time and volume of such an event is unknown. While Mount St Helens continues to vent steam and occasionally produce lava flows within the crater the likelihood of ash or Tephra Fall in Umatilla County is relatively remote. The chart below illustrates the statistical probability at 1% annually. The State Hazard Assessment for damage resulting from Volcanic Eruption is "moderate".[44]

[44] Wolfe, Edward W. and Pierson, Thomas C. 1995 Volcanic-Hazards Zonation for Mount St. Helens, Washington, 1995 Open-File Report 95-497

Volcano Impact Probability[45]

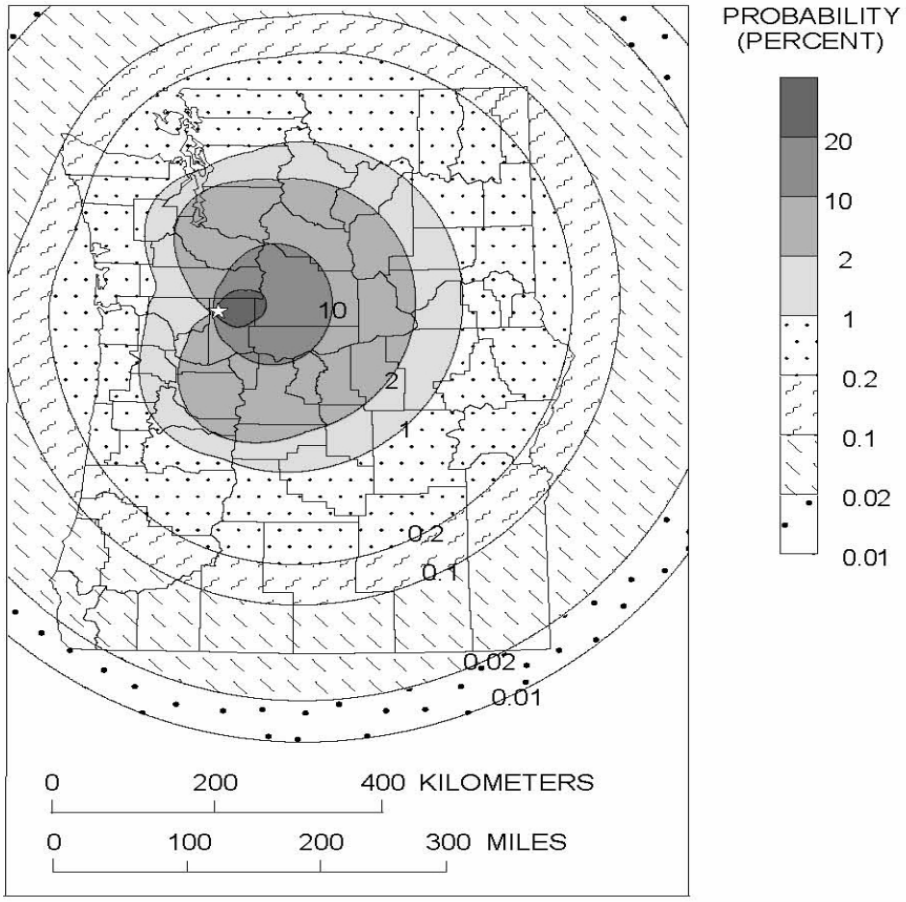

Figure P: Volcano Impact Probability

Existing Volcano Response and Mitigation Activities

Potential hazards resulting from a volcanic eruption include damage from seismic activity and damage to health and property resulting from ash deposits. Therefore, when addressing existing response and mitigation activities to mitigate potential damage from volcanic events we must include the activities associated with hazard response, advanced warning and seismic protection. These activities have been addressed in the Multi-Hazard, Severe Summer and Winter Storms and Earthquake chapters above and will not be reiterated in this chapter.

Volcano (VC) Action Items

[45] Wolfe, Edward W. and Pierson, Thomas C. 1995 Volcanic-Hazards Zonation for Mount St. Helens, Washington, 1995 Open-File Report 95-497

ST –VC[46] #1: Create volcano response protocols for protection from seismic activity and debris damage

Ideas for Implementation:

- Assess response vulnerabilities to a catastrophic event such as a volcanic eruption
- Identify projects to fix vulnerabilities and assign responsible agencies
- Conduct annual volcanic eruption response exercises coordinated by UCEM

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	1 year (Assessment) Ongoing (Response exercises)
Plan Goals Addressed:	Property Protection, Planned Prevention, Agency/Citizen Coordination, Emergency Service Planning
Priority :	Low
Cost/Benefit Outlook:	Minimal funding necessary to conduct table top and/or live volcanic response exercises

[46] Short-Term Volcano Action Item

5.08 LANDSLIDE/DEBRIS FLOW

Background

landslide or subsidence, which is the down-slope movement of rock, soil or other debris, or the opening of sinkholes. These hazards are often associated with other events, such as floods or earthquakes. Because of the moderate-to-high relief characteristics of the county's river beds, along with hill and mountainous terrain in rural areas, the chance of landslides occurring is high but is not deemed to present a serious threat to people or property.

Landslide History

Little documentation exists relaying landslide history in Umatilla County. Due to the fact that most landslide prone areas in Umatilla County are located in areas with little or no development many of the small and moderate slides have not been documented. Little or no damage costs resulting from landslides have occurred in Umatilla County.

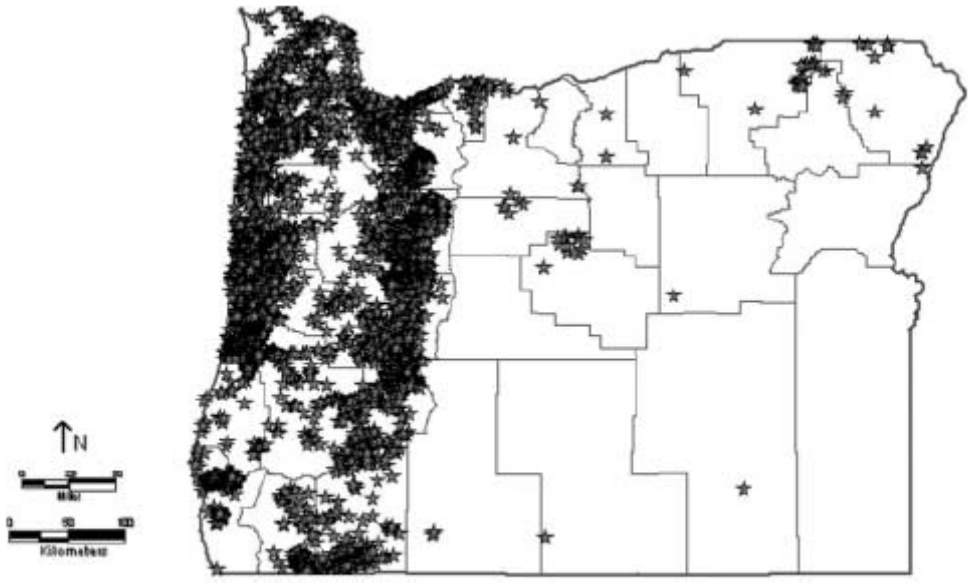

Figure 4. Distribution of database entries throughout the state.

4 Oregon Department of Geology and Mineral Industries Special Paper 34

Figure Q: Distribution of Landslides in the State of Oregon (DOGAMI)

Existing Landslide Response and Mitigation Activities

Umatilla County Comprehensive Plan and Development Code

The Goal 7 Chapter of the Umatilla County Comprehensive Plan establishes a policy to prevent development in areas where soil stability is unknown or dangerous. Chapter 152.503 of the Umatilla County Development Code implements the Comprehensive Plan through a "Steep Slope (SS)" Overlay Zone. The SS zone implements restrictions in the Multiple Use Forest exception areas that limit development on lands with 25% or greater slopes. In addition to structural development restrictions, the SS zone implements road development standards on areas prone to land slides as well as limits excavation and removal of vegetation to encourage soil stability.

The SS zone is a good attempt to prevent development in harms way but Umatilla County has lacked sufficient funds to accurately map areas that the zone would apply too. The lack of mapping technology requires staff to rely on a signed affidavit from an applicant that states that the development will meet the SS standards. More accurate information is necessary to assure that the development code is protecting the intent of the Comprehensive Plan.

DOGAMI

DOGAMI implements standards to assure that aggregate operations maintain safe slopes during the mining operation and after an aggregate site has been exhausted. Some sites are exempt from DOGAMI standards, though, and may require mitigation funding to reclaim the grandfathered sites to a safe condition.

Survey Results

Survey results revealed the following mitigation/response tools that may be utilized for landslide hazard applications:

- ODOT has manpower & equipment dedicated to traffic control and road maintenance
- Rural fire districts can promote public safety through outreach and provide disaster response to protect life and property
- OSP can provide a public safety outreach and also has boats resources available to respond to evacuation or search and rescue events that may result from a landslide

Land Slide (LS) Action Items

ST –LS[47] #1: Update Goal 7 of the Umatilla County Comprehensive Plan with maps designating landslide prone areas or areas where the SS Overlay Zone applies.

Ideas for Implementation:

- Utilize DOGAMI, County and contract GIS agencies to map slopes over 25% within existing Multiple Use Forest zones.
- Identify areas that may see development pressures in the next five years and map slope severity in those areas
- Overlay property ownership maps to assist in outreach efforts and permitting processes should development be proposed.

Coordinating Organization:	Umatilla County Planning
Timeline:	1 year (Assessment) Ongoing (Outreach and Permitting)
Plan Goals Addressed:	Property Protection, Planned Prevention, Agency/Citizen Coordination, Natural Resource Protection, Emergency Service Planning
Priority :	Moderate to High
Cost/Benefit Outlook:	Good due to minimal funding requirements and potential for cost share

LT-LS[48] #1: Identify and implement mitigation measures where important infrastructure for evacuation, emergency vehicle access, commodity transport, information dissemination and utilities may be prone to damage from site specific landslides.

Ideas for Implementation:

- Utilize DOGAMI, County and contract GIS agencies to map slopes over 25% within existing Multiple Use Forest zones.
- Identify areas that may see development pressures in the next five years and map slope severity in those areas

[47] Short-Term Land Slide Action Item
[48] Long-Term Land Slide Action Item

- Overlay property ownership maps to assist in outreach efforts and permitting processes should development be proposed.

Coordinating Organization:	Umatilla County Emergency Management
Timeline:	3-10 years
Plan Goals Addressed:	Property Protection, Planned Prevention, Agency/Citizen Coordination, Natural Resource Protection, Emergency Service Planning
Priority :	Moderate
Cost/Benefit Outlook:	Good to complete assessment costs. Mitigation depends on value of infrastructure protected

5.09 DROUGHT

Background

Drought involves a period of prolonged dryness resulting from a lack of precipitation or diversion of available water supplies. Umatilla County has suffered periods of drought in the past; however the main impact of drought has been on agriculture, fish, and wildlife, as well as an increased fire risk. A severe drought could require strict water conservation/regulatory measures to ensure adequate supplies of raw and treated/potable water.

In addition to drought that impacts surface water supplies, Umatilla County has experienced another form of water shortages, not commonly referred to as a drought but just as damaging to the long term economic and resource sustainability of the region. Umatilla County encompasses four of six State of Oregon Designated Critical Groundwater Areas due to extreme water declines in the regions' alluvial and deep basalt groundwater aquifers.

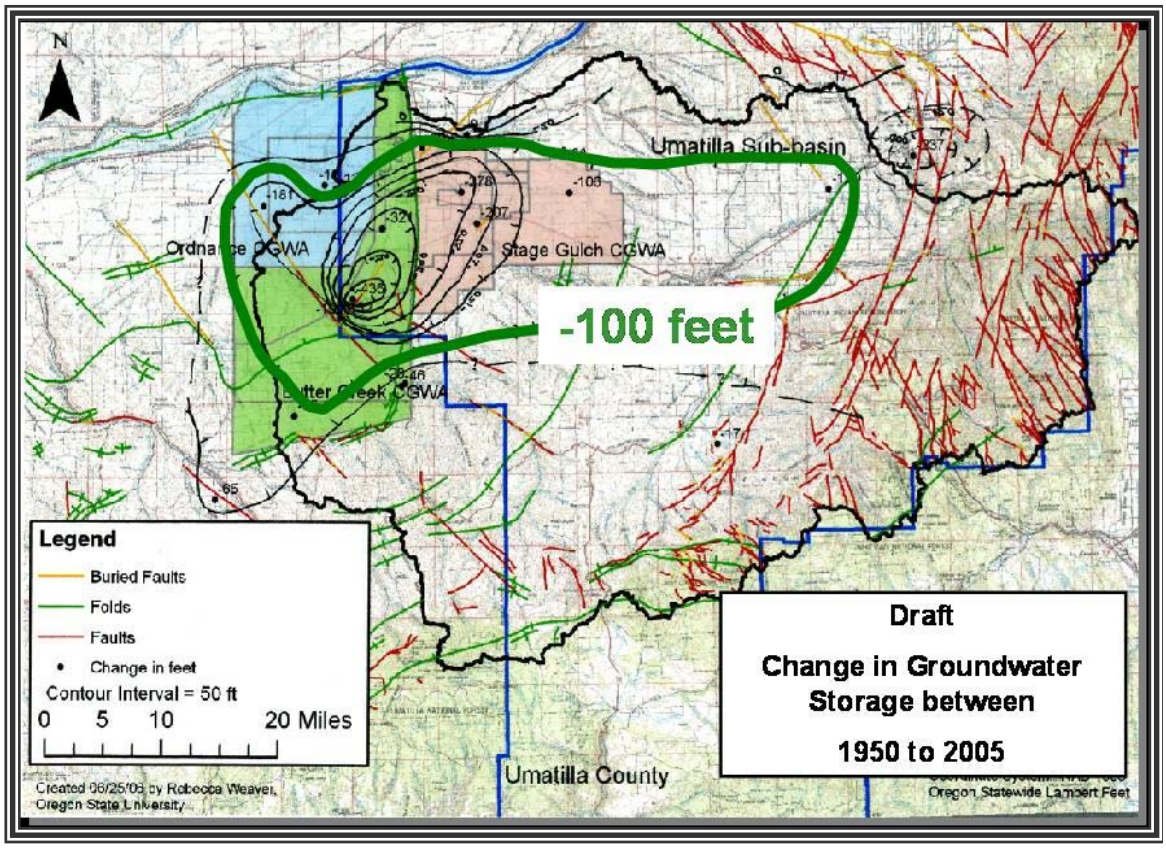

Figure R: Groundwater Contour Map Showing Groundwater Declines in Umatilla County (Oregon State University, Institute for Natural Resources)

Drought History

In a recent letter to Governor Ted Kulongoski, the Oregon Office of Rural Policy sited 44 state of emergency declarations for drought and low water conditions in 23 of Oregon's 35 counties over the last five years. Umatilla County submitted emergency declarations due to low water conditions and drought in 2002 and 2005.

In addition to the surface water drought, the western part of Umatilla County has had approximately 104,000 acre-feet of groundwater rights curtailed due to groundwater declines. These groundwater declines have directly impacted fisheries, the aquatic environment, economic development and long-term rural and urban economic security. A chronological water history of Umatilla County is as follows:

UMATILLA COUNTY WATER CHRONOLOGY[49]

1855	Treaty with the Walla Walla, Cayuse and Umatilla Tribes and the United States government -- treaty reserved rights for tribes to hunt, fish and gather traditional foods
1859	Treaty ratified by Congress
1862	Irrigation begins in Umatilla County
1880-1920	population increase
1890	Umatilla Meadows and Butter Creek Canal Company organized to enlarge and extend ditch diverting water from Umatilla River to irrigate land across the river from Echo -- becomes Hinkle Ditch Company
1893	Intention of Water Use (first State of Oregon water allocation law)
1903	Bureau of Reclamation (BoR) begins investigations to determine feasibility of irrigating lands around the Umatilla River
1903	Gaging station established on Umatilla River -- two miles upstream from mouth of the river
1903	Hinkle Ditch Company begins irrigating land south and east of Hermiston by diverting water from Umatilla River

[49] Catherine Howells, Oregon State University, Institute for Water and Watersheds

1905	Furnish Ditch Company begins construction of system to irrigate several thousand acres near Stanfield by diverting water from Umatilla River
1906	BoR construction of projects begins after Congressional approval
1908	Winters v. United States (legal basis for reserved water rights for tribes)
1908	Hermiston Irrigation District created
1908	Cold Springs Dam and Reservoir, Feed Canal Diversion Dam and Feed Canal completed -- to supply supplemental irrigation water to the Hermiston Irrigation District
1909	Furnish Dam completed
1912	Maxwell Diversion Dam completed
1913-17	Three Mile Falls Diversion Dam and West Extension Main Canal built to provide water to West Extension Irrigation District
1916	Adjudicated decree of water rights to use waters of Umatilla River and itstributaries (1953 supplemental findings and order of determination identified inchoate rights to be allowed)
1917	West Extension Irrigation District created
1920 - 1940	Population and economic decline (summer water shortages and soils unsuited for irrigation). Decline in irrigated acreage continued until 1949, when trend reversed
1925	First well (125 feet) in Butter Creek area
1926	State fish and wildlife experts report that there were no chinook or coho left in the Umatilla River
1927	McKay Dam and Reservoir completed -- to supplement water supplies for Stanfield and Westland Irrigation Districts
1938	Bonneville Dam completed
1940	BoR Pendleton Project initiated

1940 – 2000	Population increase due to Federal projects (Umatilla Depot, McNary Dam construction) and manufacturing/processing plants
1949 - 1959	Alfalfa production increases 45% (more irrigated alfalfa and less non-irrigated hayland)
1950s	Irrigation from groundwater begins
1951	BoR report on McNary Gravity Investigation concluded to no irrigation facilities were required in McNary Dam and recommended additional study of potential irrigation development areas in the Plymouth Bench area
1952	First deep well (554 feet) in Butter Creek Area (deepened to 840 feet in 1961)
1954	Pendleton Project Investigation by BoR. Identified several plans for storage and utilization of surplus Umatilla River waters. Concluded that potential irrigable land far exceeded available water supply. No plans were financially feasible in terms of full repayments of reimbursable costs within 40 years (report released locally as an information document to aid local planning)
1955	Oregon Groundwater Act: No water rights needed for stockwatering, irrigating lawns or non-commerical gardens of 1/2 acre, for single or group domestic purposes not exceeding 15,000 gallons per day , or for single industrial or commercial purpose not to exceed 5,000 gallons per day
1958	First reports of water table decline in Butter Creek area
1959	BoR determines available water storage based on adjudicated rights and permits on the Umatilla River
1960	Groundwater level monitoring begins in Butter Creek area
1960s	Groundwater levels dropping in Battle Creek
1963	BoR report on possible Birch Creek Diversion Unit -- reanalyzed canal plan and concluded construction still unwarranted
1963	OWRD produces map showing location of 480 sub-basin water rights; reports on scarcity of groundwater and minimal recharge

1963	OWRD reports that fish life will probably take an increasing non-consumptive use of water in the Umatilla River
1963	ODFW conducts survey of steelhead and chinook spawning habitat on the upper Umatilla River
1964	Based on local and state concerns, BoR begins study to provide comprehensive analysis of multiple-purpose development potential on basin-wide scale (results published in 1970)
1964	Oregon Water Resources Commission adopts Umatilla Basin program
1966	Groundwater use for center pivot irrigation begins
1966	Congressional authorization for Secretary of the Interior to conduct feasibility investigation to expand irrigation base and address anadromous fishery needs in the Umatilla Basin
1969	BoR constructs pumping plant on Columbia River to lift water into West Extension Canal
1970	BoR reports that any significant increase in pumping from basalt aquifers would likely result in accelerated decline of water tables
1972	72 irrigation wells in Butter Creek area (depth 665-1500 feet)
1972	Federal Clean Water Act
1973	Oregon Senate Bill 100 signed by Governor McCall. Creates Oregon statewide planning program with the Land Conservation and Development Commission (LCDC) and the Department of Land Conservation and Development (DLCD).
1974	Oregon LCDC adopts 14 statewide planning goals
1974	Eastern Central Oregon Association of Counties completes Regional Water System Feasibility Study for Hermiston-Boardman, Oregon
1975	Port of Umatilla proposes a regional water system based on their permit for the project of 155 cfs from the Columbia River
1976	OWRD designates Butter Creek a Critical Groundwater Area

	(remanded until 1986)
1976	Critical Groundwater Area designated by OWRD for Ordnance Basalt
1976	Critical Groundwater Area designated by OWRD for Ordnance Gravel
1977	Lost Lake/Depot well owners initiated project to artificially recharge shallow gravel aquifer using existing canal system
1980	CTUIR initiates Umatilla Salmon Recovery Project
1980	ODFW initiates a steelhead supplementation program
1980s	Coalition formed between CTUIR and local irrigators to recover salmon populations -- BoR, BPA, OWRD and ODFW participate
1980	ODFW begins hatchery outplanting program on Umatilla River to supplement natural production
1983	Umatilla County Comprehensive Plan recognizes that availability of water is a key resource for economic growth
1983	ODFW and ODEQ submit minimum streamflow requirements for Umatilla Basin to State Water Resources Board
1984	Umatilla Chemical Depot placed on EPA's National Priorities List because of soil and groundwater contamination
1984	Formation of Umatilla Basin Project Steering Committee
1985	Umatilla River and tributaries withdrawn from further appropriation by Oregon Water Resources Commission and minimal perennial stream flows adopted by Umatilla River and Birch Creek
1985	Umatilla Basin Fish Resource Improvement Committee (UBFRIC) adopts plan. Developed in cooperation with CTUIR, ODFW, National Marine Fisheries Service, Fish and Wildlife Service, BoR and Forest Service (funding for plan from BPA)
1986	Critical Groundwater Area designated by OWRD for Buttercreek Basalt
1986	Report to the Governor, Umatilla Basin Ground Water Task

	Force (identifies water use concerns and suggests alternatives)
1987	Oregon Instream Water Rights Act -- recognizes instream uses as beneficial
1988	Umatilla Basin Project authorized and funded by Congress (developed by CTUIR and irrigators coalition -- allows irrigators to exchange Umatilla River water for Columbia River water)
1988	Oregon Water Resources Commission approves Oregon Water Plan: Umatilla Basin Sections
1989	Oregon Groundwater Quality Protection Act
1990	Classified Groundwater Area designated by OWRD for Ella Butte (exempt uses only)
1990	ODEQ declares 352,000 acres in Umatilla and Morrow counties as a groundwater management area (GWMA) after discovering elevated levels of nitrates in wells -- leads to the Lower Umatilla Basin GWMA Voluntary Plan
1991	Critical Groundwater Area designated by OWRD for Stage Gulch Basalt
1991	OWRD enforces compliance against waterspreading
1992	Oregon DEQ and EPA conduct sampling to characterize regional groundwater quality -- Lower Umatilla Basin identified as area of elevated nitrate in groundwater
1994	Salmon return to the Umatilla River (first time in seventy years)
1995	Columbia River Intertribal Fish Commission (CRITFC) develops anadromous fish restoration plan for Columbia River Basin
1997	Oregon Plan for Salmon and Watersheds
2003	Umatilla County ranked fifth in state in agricultural commodity sales at $200 million
2003	Oregon Water Resources Department report published -- Ground Water Supplies in the Umatilla Basin
2003	Aquifer Storage and Recovery (ASR) Pilot Testing in for City of Pendleton

2004	Umatilla County Critical Groundwater Task Force created by the Umatilla County Board of Commissioners in order to develop a "2050 Plan" to assure adequate groundwater for broad community needs through the year 2050
2004	Northwest Power and Conservation Council (NWPCC) adopts Umatilla Subbasin Plan
2005	Board of Commissioners of Umatilla County adopt Exempt Well Resolution until 2050 plan is authorized

Table 5-8: Umatilla County Water Chnronology

Existing Drought Response and Mitigation Activities

OWRD

OWRD has ORS and OAR authority to implement special "drought rules" during times of surface water shortage. These rules allow higher use of supplemental groundwater rights and temporary, emergency water rights transfers to ensure that crops are not lost due to lack of water. While this program works during times of surface water shortages it allows the extended use of groundwater aquifers that are already depleted, some of which have declined over 400 feet.

Umatilla County Critical Groundwater Task Force

Based on the knowledge that nothing has been solved since the aquifers underlying Umatilla County first started declining in 1958 the Umatilla County Board of Commissioners chartered the Umatilla County Critical Groundwater Task Force. The Task Force's mission is to "[i]dentify and implement technically and economically feasible measures to enhance and protect groundwater quantity and quality through the year 2050, as an essential natural resource necessary to assure continued economic development in Umatilla County, especially in designated Critical Groundwater Areas.[50]" The Task Force has been meeting since January, 2004 and has concluded that groundwater and surface water are interconnected, basin wide concerns requiring a basin wide plan. They have established four concepts to assure long term water sustainability. These concepts are included as drought action items below.

Umatilla County Watershed Councils

The Umatilla Basin and Walla Walla Basin Watershed Councils were established to promote environmental restoration along the tributaries and mainstem Umatilla and Walla Walla Rivers. These councils have completed

[50] Umatilla County Critical Groundwater Task Force

projects ranging from recharge of alluvial aquifers to riparian planting and federal conservation projects.

Drought (DR) Action Items

ST –DR[51] #1: Complete 2050 Water Management Plan

Ideas for Implementation:

- Complete chapter to address opportunities to relieve the full irrigation season groundwater deficit in the Critical Groundwater Areas.
- Address methods to prevent further declines in groundwater levels throughout the entire Umatilla Basin.
- Utilize available Columbia River water to relieve water supply deficits in the Umatilla Basin.
- Minimize use of Umatilla River flows and groundwater in the lower basin so these water supplies are available for upper basin uses, including Umatilla Tribes' unquantified water claims, where use of Columbia River water is currently not feasible.
- Restore stream flow in the Umatilla River during low-flow period.
- Develop water supplies for future uses throughout the basin.
- Obtain the necessary scientific data to manage water resources for sustainability and to meet the water needs for multiple beneficial uses as determined by the local community.
- Reach parity amongst all Columbia River Basin water users.
- Attain funding to continue outreach campaign stressing the importance of long range water supply planning and projects

Coordinating Organization:	Umatilla County
Timeline:	1 year (Planning) Ongoing (Outreach, Projects and Regulation)
Plan Goals Addressed:	Property Protection, Public Outreach, Planned Prevention, Agency/Citizen Coordination, Natural Resource Protection
Priority :	High

[51] Short-Term Drought Action Item

Cost/Benefit Outlook: Good due to minimal funding requirements to complete plan. Umatilla County already committed to complete plan but may need funding to establish and effective implementation mechanism.

LT-DR[52]#1. Utilize Columbia River Water for replacement of certificated groundwater irrigation rights.

This approach would deliver Columbia River water to replace the certificated groundwater rights in the CGAs. The purpose would be to fulfill 100% of certificated irrigation water rights and to guarantee water for the entire crop year. This would significantly reduce groundwater pumping and may allow the aquifer to recharge. Evidence suggests, however, that groundwater recharge is very limited and further study is needed to determine sustainable use of the aquifers. Groundwater recharge may not be adequate to meet existing demand for other uses, including exempt (domestic) wells and municipal and industrial uses. This approach would complement existing artificial recharge and other environmental restoration projects in the basin.

About 125,000 acre feet of surface water is needed to meet certificated or currently permitted groundwater irrigation rights in the CGAs in Umatilla County.

Ideas for Implementation:

- Attain authorization to optimize existing BOR infrastructure for multi-beneficial use water projects
- Attain state and federal funding to complete infrastructure and storage projects
- Deliver 73,000 acre-feet in existing Phase II or other infrastructure
- Complete Stage Gulch Storage Project (20,000 - 30,000 acre-feet).
- Expand Cold Springs Storage (20,000 – 30,000 acre-feet).
- Balance of need (~20-25,000 acre feet) to be met by aquifer recharge (storage) in the alluvial aquifer and by direct supply.
- Utilize existing and new infrastructure to distribute 52,000 acre-feet of water into the CGA's.
- Utilize regulation to assure that aquifers remain fee of excessive pumping to allow natural recharge to begin

[52] Long-Term Drought Action Item

Coordinating Organization:	Umatilla County
Timeline:	10-20 years
Plan Goals Addressed:	Property Protection, Planned Prevention, Agency/Citizen Coordination, Public Outreach, Natural Resource Protection
Priority :	High
Cost/Benefit Outlook:	Good to complete assessment costs. Mitigation depends on value of infrastructure protected

LT-DR #2 Provide Funds for Groundwater Studies to Ensure Water-resource Sustainability.

Ideas for Implementation:

- Complete a comprehensive groundwater study by the USGS with optimization modeling (analysis of the short and long-term effects of various water-management alternatives)
- Utilize completed studies to develop defensible scientific data on the basin's hydrology
- Develop agreements and coordination to ensure that water managers and stakeholders make informed decisions on how water is managed in the Basin.
- Funding from the State of Oregon and stakeholders would be required to generate match funding to complete the study.

Coordinating Organization:	Umatilla County
Timeline:	5-10 years
Plan Goals Addressed:	Property Protection, Planned Prevention, Agency/Citizen Coordination, Public Outreach, Natural Resource Protection
Priority :	High
Cost/Benefit Outlook:	Dependent upon State of Oregon or local government to generate cost share to match any federal commitment.

LT-DR #3. Complete Settlement of CTUIR Water Claims and Maximize benefit of Phase III exchange infrastructure.

Ideas for Implementation:

- Support efforts by the CTUIR, Westland Irrigation District (WID), and State of Oregon to plan and implement Phase III of the Umatilla Basin Project.
- Coordinate to assure that the Phase III project would provide Columbia River water to WID and others in a bucket-for-bucket exchange for the district's McKay Reservoir and Umatilla River water.
- Investigate the possibility that McKay and Umatilla River water could be used by the CTUIR for fishery augmentation and for consumptive use on the Reservation to meet CTUIR water needs.
- Investigate an added feature to Phase III for the use of the infrastructure to deliver and store Columbia River water to help offset some of the water deficits in the CGAs. Such use of the infrastructure could increase the benefits of the Phase III project and distribute the financial obligation among more users.

Coordinating Organization:	Umatilla County
Timeline:	5-15 years
Plan Goals Addressed:	Property Protection, Planned Prevention, Agency/Citizen Coordination, Public Outreach, Natural Resource Protection
Priority :	High
Cost/Benefit Outlook:	High cost of project (+/- $250 million) may impact cost benefit potential

Chapter 6. GLOSSARY

ARC: American Red Cross
BIA: United States Bureau of Indian Affairs
BLM: United States Bureau of Land Management
CFR: Certificate of Federal Record
CGA: State of Oregon designated Critical Groundwater Area
CSEPP: Chemical Stockpile Emergency Preparedness Program
CTUIR: Confederated Tribes of the Umatilla Indian Reservation
DHS: Oregon Department of Homeland Security
CWPP: Community Wildfire Protection Plan
Dispatch: Umatilla County 911 Dispatch
DLCD: Oregon Department of Land Conservation and Development
DOGAMI: Oregon Department of Geology and Mineral Industries
DSL: Oregon Department of State Lands
EM: Emergency Management
EOC: Umatilla County Emergency Operations Center
FEMA: Federal Emergency Management Agency
FEMIS: Federal Emergency Management Information System
FIRM: Flood Insurance Rate Map
GIS: Global Information Systems
JIC: Umatilla County Joint Information Center
NOAA: National Oceanic and Atmospheric Administration
NOAA NWS: National Oceanic and Atmospheric Administration, National Weather Service
NRCS: United States Natural Resource Conservation Service
OAR: Oregon Administrative Rule
OECDD: Oregon Economic and Community Development Department
ODA: Oregon Department of Agriculture
ODOT: Oregon Department of Transportation
ODF: Oregon Department of Forestry
ODF&W: Oregon Department of Fish and Wildlife
OEM: Oregon Office of Emergency Management
ONHW: Oregon Natural Hazards Working group
ORS: Oregon Revised Statute
OSP: Oregon State Police
OWRD: Oregon Water Resources Department
Phase III: Phase III of the Umatilla Basin Project
Response Agencies: Departments and agencies directly involved with emergency response

RS&D: Umatilla County Department of Resource Services and Development
Special Districts: Districts that were formed or operate for a specific purpose (e.g. Irrigation Districts)
SWCD: Umatilla County Soil and Water Conservation District
TAR: Tone Alert Radio
Task Force: Umatilla County Critical Groundwater Task Force
UBWC: Umatilla Basin Watershed Council
UCEM: Umatilla County Emergency Management
USACE: United States Army Corps of Engineers
USBR: United States Bureau of Reclamation
USDA: United States Department of Agriculture
USFS: United States Forest Service
USFWS: United States Fish and Wildlife Service
USGS: United States Geological Survey
Wheat League: Oregon Wheat League
WWBWC: Walla Walla Basin Watershed Council

Chapter 7. RESOURCE DIRECTORY