

**Sonoma County General Plan 2020**

**PUBLIC SAFETY ELEMENT**

**Sonoma County Permit and Resource Management Department  
2550 Ventura Avenue  
Santa Rosa, CA 95403**

**Adopted by Resolution No. 08-0808  
of the Sonoma County Board of Supervisors  
September 23, 2008**

**Revised by Resolution No. 14-0355  
of the Sonoma County Board of Supervisors  
September 9, 2014**



## **PUBLIC SAFETY ELEMENT TABLE OF CONTENTS**

1.	INTRODUCTION	PS-1
	1.1 PURPOSE	PS-1
	1.2 RELATIONSHIP TO OTHER ELEMENTS	PS-1
	1.3 SCOPE AND ORGANIZATION	PS-2
	1.4 DETERMINATION OF ACCEPTABLE RISKS	PS-2
2.	PROTECTION FROM GEOLOGIC HAZARDS	PS-2
	2.1 GEOLOGIC HAZARDS IN SONOMA COUNTY	PS-2
	2.2 PLANNING ISSUES	PS-4
	2.3 REDUCTION OF POTENTIAL DAMAGE FROM GEOLOGIC HAZARDS	PS-5
3.	PROTECTION FROM FLOOD HAZARDS	PS-7
	3.1 FLOOD HAZARDS IN SONOMA COUNTY	PS-7
	3.2 PLANNING ISSUES	PS-7
	3.3 REDUCTION OF POTENTIAL DAMAGE FROM FLOODING	PS-9
4.	PROTECTION FROM WILDLAND FIRE HAZARDS	PS-12
	4.1 WILDLAND FIRE HAZARDS IN SONOMA COUNTY	PS-12
	4.2 PLANNING ISSUES	PS-14
	4.3 REDUCTION OF POTENTIAL DAMAGE FROM WILDLAND FIRE HAZARDS	PS-17
5.	PROTECTION FROM HAZARDOUS MATERIALS	PS-18
	5.1 HAZARDOUS MATERIALS IN SONOMA COUNTY	PS-18
	5.2 PLANNING ISSUES	PS-19
	5.3 REDUCTION OF POTENTIAL DAMAGE FROM HAZARDOUS MATERIALS	PS-19
6.	PUBLIC SAFETY IMPLEMENTATION PROGRAM	PS-21

## LIST OF FIGURES

Figure PS-1a: Earthquake Ground Shaking Hazard Areas	After Text
Figure PS-1b: Earthquake Fault Hazard Areas	After Text
Figure PS-1c: Liquefaction Hazard Areas	After Text
Figure PS-1d: Deep Seated Landslide Hazard Areas	After Text
Figure PS-1e: Flood Hazard Areas	After Text
Figure PS-1f: Dam Failure Inundation Hazard Areas	After Text
Figure PS-1g: Wildland Fire Hazard Areas	After Text

# PUBLIC SAFETY ELEMENT

## 1. INTRODUCTION

### 1.1 PURPOSE

The Public Safety Element is intended to protect the community from unreasonable risks from seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche and dam failure, slope instability leading to mudslides, landslides, subsidence and other known geologic hazards, flooding and fire. It includes maps of known hazards and assesses evacuation routes, water supply needs, road widths, clearances around structures and other items related to potential catastrophic events.

The Public Safety Element establishes policies to minimize potential property damage and human injury by reducing the exposure of persons and property to the above hazards and to hazardous materials. Acceptable levels of risk are based upon the nature of each hazard, the frequency of exposure, the number of persons exposed, and the potential damage.

The policies in this Element are intended to avoid development that would adversely affect future residents and visitors as well as adjacent property and residents. It is also intended that an undue financial burden not be placed on the taxpayer by allowing development which may have unusually high costs for public services and disaster relief.

In addition, the Federal Emergency Management Agency (FEMA) now requires local agencies to adopt a Local Hazard Mitigation Plan (LHMP) in order to be eligible for pre-disaster mitigation funds. The Sonoma County Hazard Mitigation Plan (SCHMP) addresses the four significant natural disasters that may affect Sonoma County - earthquake, landslide, flood, and wildfire hazards and assesses the County's risk and vulnerabilities to them. The SCHMP also identifies community policies, actions, and tools for implementation to reduce the public's exposure to these hazards and to minimize property damage, personal injury, community disruption, and reduce or avoid the costs of disaster relief. The Sonoma County Hazard Mitigation Plan is incorporated by reference and integrated into this Element to assure consistency with the LHMP as it is updated and revised every five years.

### 1.2 RELATIONSHIP TO OTHER ELEMENTS

The natural hazards contained in this Element have been considered in the preparation of the Land Use Element. The Land Use Element limits the range of land uses allowed in hazardous areas in order to reduce the number of people and buildings exposed to risk. Public Safety Element policies are also coordinated with the policies of the Open Space and Resource Conservation, Housing, Public Facilities and Services, and Circulation and Transit Elements.

### **1.3 SCOPE AND ORGANIZATION**

This Element contains sections on geologic hazards, flood hazards, wildland fire hazards, and hazardous materials. Each section describes the extent of the hazard, the risk of damage, and means of protection. An implementation program is also included.

### **1.4 DETERMINATION OF ACCEPTABLE RISKS**

The County is not able to guarantee that any particular development will not, at some time in the future, be adversely affected by the hazards identified in this Element because such hazards, by their nature, defy precise prediction.

In those instances where there is a significant factual question about whether a particular development has mitigated risks from natural hazards to an "acceptable" level and the property owner wishes to proceed in the face of such factual question, the County may require the owner of the property to provide indemnification to the County, insurance, or other security and a recorded notice which will protect the interests of the County and provide notice of the potential problem to future purchasers.

## **2. PROTECTION FROM GEOLOGIC HAZARDS**

### **2.1 GEOLOGIC HAZARDS IN SONOMA COUNTY**

#### **Seismic Hazards**

Sonoma County is a seismically active region. Since 1855, more than 140 earthquakes have been felt in the Santa Rosa area. The 1906 earthquake caused 61 deaths and major damage in Santa Rosa, Sebastopol, Healdsburg and other communities. The last major earthquake in Sonoma County was the 5.7 magnitude event on the Healdsburg - Rodgers Creek fault in Santa Rosa in 1969. Analysis of seismic data indicates that the San Andreas and the Healdsburg-Rodgers Creek faults may generate a maximum credible earthquake of magnitude 8.5 and 7.5, respectively. Earthquakes of 8.0 or more on the San Andreas Fault can be expected every 50 to 200 years.

Earthquakes can result in the following geologic hazards.

**Fault Movement:** Earthquakes are usually caused by sudden movement along geologic faults. Sonoma County faults are part of the San Andreas Fault system which extends along the California coast. The known geologic faults in Sonoma County are shown on Figure PS-1b. All show evidence of movement during the past 2 million years and are considered to be active or potentially active.

Footnote: "\*" = Mitigating Policy

**Groundshaking:** Groundshaking from earthquakes affects the most people and can cause the most damage of any geologic hazard. The amount of ground shaking depends on the magnitude of the earthquake, the distance from the epicenter, and the type of earth materials in between. Groundshaking hazard areas in Sonoma County are shown on Figures PS-1a and are based upon data received from the Association of Bay Area Governments which is based on data from the U.S. Geological Survey and California Geological Survey.

**Ground Failure:** Damage from groundshaking can be increased by ground failure due to liquefaction and landslides. Liquefaction changes water saturated soil to a semi-liquid state, removing support from foundations and causing buildings and utilities to shift or subside. Areas most prone to liquefaction are valleys and tidal marshes with high water tables and sandy soils. Areas of the county subject to liquefaction hazards are shown on Figure PS-1c. Strong groundshaking can destabilize slopes and result in landslides. Landslides may occur in areas of weak rock and increase with saturated soil.

**Ground Displacement Along Fault Traces:** During the 1906 earthquake horizontal displacement along the San Andreas fault averaged 15 feet in Sonoma County. The Healdsburg, Rodgers Creek and Mayacama faults also show evidence of surface displacement during the past 11,000 years. The known geologic faults in Sonoma County are shown on Figure PS-1b.

**Tsunamis:** Tsunamis are large ocean waves caused by undersea earthquakes or landslides. They travel up to 400 mph and can arrive at a coastline before local warnings can be given. The area covered affected by a tsunami is determined by water depth, underwater topography, and shape of the coastline. A tsunami expected to occur in Sonoma County once in 200 years would flood the coast and bay shoreline up to 20 feet above sea level. The areas at risk from tsunamis are shown in the County Local Coastal Plan Public Safety Element and County Tsunami Response Plan.

**Secondary Effects of Earthquakes:** Earthquake damage to utilities and other public facilities can produce disastrous secondary effects. Much of the destruction from the 1906 earthquake was from fires that could not be put out due to broken water lines, damaged roads and lack of communications. These secondary effects can be reduced by various methods but larger facilities and population growth increase the potential damage.

Earthquakes could also potentially damage dams and result in the release of reservoir waters, thereby creating secondary flood hazards downstream. The largest county dam is the Warm Springs Dam which creates the Lake Sonoma Reservoir. It was designed to absorb the maximum expected displacement and ground shaking from faults in the region and is inspected by the Army Corps of Engineers on an ongoing basis. There are over 60 other dams in the County which are regulated by the State Department of Water Resources Dam Safety Division. Though such structures are generally designed and engineered to withstand seismic events without failing, some risk remains. The areas that may be potentially inundated from dam failure are shown in figure PS-1f.

**Landslides:** The most common type of ground failure in Sonoma County is landslides, the downslope movements of soil and rock materials. Extensive land areas of the County are subject to this hazard and are shown on Figures PS-1d. Landslide risk is greatest in areas of weak soil and rock and on steep slopes. Landslides can be triggered by heavy rainfall, earthquakes, or human activities such as road cuts, grading, construction, removal of vegetation, and changes in drainage.



**Expansive Soils:** Buildings, utilities, and roads can be damaged by clay rich soils which shrink and swell seasonally depending upon their water content and the rainfall. This is a less obvious hazard than earthquakes or landslides, but the gradual cracking, settling, and weakening of older buildings has a significant cumulative effect. Soils with high clay content are found in many valley areas that are planned for development.

## 2.2 PLANNING ISSUES

### Assessment of Hazards and Risks

State law requires a geologic report for projects along known active faults. "Special Studies" zones have been designated along four faults in Sonoma County where surface movement has taken place during the past 11,000 years.

### Development Planning and Regulation

Reducing risks of damage and injury to acceptable levels requires special permit review procedures and construction standards. Construction must meet the standards of the Uniform Building Code for seismic resistance, site stability, grading, and geologic studies. Dams, schools, hospitals, and power plants are specially regulated by State and Federal agencies for protection against such hazards.

Land uses vary in their sensitivity to geologic hazards. Agriculture and timber management are considered appropriate in areas subject to geologic hazards because such uses require few occupied structures. Structures should not be placed on known landslides or faults and, when located close to these features, may need special design to withstand damage. Schools, utility structures, hospitals, and power plants are especially sensitive to geologic hazards.

Footnote: "\*" = Mitigating Policy

## 2.3 REDUCTION OF POTENTIAL DAMAGE FROM GEOLOGIC HAZARDS

**GOAL PS-1:** Prevent unnecessary exposure of people and property to risks of damage or injury from earthquakes, landslides, and other geologic hazards.

**Objective PS-1.1:** Continue to develop and utilize use available data on geologic hazards and associated risks.

**Objective PS-1.2:** Regulate new development to reduce the risks of damage and injury from known geologic hazards to acceptable levels.

**Objective PS-1.3:** Use the Sonoma County Hazard Mitigation Plan to help reduce future damage from geologic hazards.

**The following policies, in addition to those in the Land Use Element, shall be used to achieve these objectives:**

**Policy PS-1a:** Continue to use all available data on geologic hazards and related risks from the appropriate agencies.\*

**Policy PS-1b:** Continue to use studies of geologic hazards prepared during the development review process.\*

**Policy PS-1c:** Consider amendments of this Element to incorporate new data which significantly change the hazard assessments contained herein.\*

**Policy PS-1d:** Support and integrate research on geologic hazards, their probabilities, and their effects within Sonoma County.\*

**Policy PS-1e:** Continue to implement the "Geologic Hazard Area" combining district which establishes regulations for permissible types of uses and their intensities and appropriate development standards.\*

**Policy PS-1f:** Require and review geologic reports prior to decisions on any project which would subject property or persons to significant risks from the geologic hazards areas shown on Public Safety Element hazard maps and related file maps and source documents. Geologic reports shall describe the hazards and include mitigation measures to reduce risks to acceptable levels. Where appropriate, require an engineer's or geologist's certification that risks have been mitigated to an acceptable level and, if indicated, obtain indemnification or insurance from the engineer, geologist, or developer to minimize County exposure to liability.\*

**Policy PS-1g:** Prohibit structures intended for human occupancy (or defined as a "project" in the Alquist-Priolo Special Studies Zones Act and related Administrative Code provisions) within 50 feet of the surface trace of any fault.\*

Footnote: "\*" = Mitigating Policy  
**PS-5**

**Policy PS-1h:** Adopt, upon approval by the International Code Council (ICC) and the State of California, revisions to the Uniform Building Code which increase resistance of structures to groundshaking and other geologic hazards.\*

**Policy PS-1i:** Require dynamic analysis of structural response to earthquake forces prior to County approval of building permits for structures whose irregularity or other factors prevent reasonable load determination and distribution by static analysis.\*

**Policy PS-1j:** Encourage strong enforcement of State seismic safety requirements for design and construction of buildings and facilities subject to State and Federal standards such as bridges, dams, power plants, hospitals and schools.\*

**Policy PS-1k:** Incorporate measures to mitigate identified geologic hazards for all County roads, public facilities, and other County projects to an acceptable level.\*

**Policy PS-1l:** Use the following criteria in siting and design of essential service buildings and facilities, particularly those of high public occupancy:

- (1) To the extent feasible, avoid siting such buildings and facilities in areas subject to a Modified Mercalli Index (MMI) Groundshaking Intensity Level of Very Violent (X), Violent (IX), or Very Strong (IIX) as shown on Figures PS-1a.
- (2) Where such buildings and facilities must be located in the above areas, design and construct them to the highest feasible safety standard.\*

**Policy PS-1m:** Make readily available to property owners and the public all maps identifying geologic hazards in Sonoma County, particularly the MMI Groundshaking Intensity Level maps noted above.\*

**Policy PS-1n:** Develop a Strategic Plan for damage assessment and recovery of essential service buildings and facilities, particularly those of high public occupancy, as part of the County's emergency response planning, focused in areas subject to an MMI Groundshaking Intensity level of Very Violent (X), Violent (IX), or Very Strong (IIX).\*

**Policy PS-1o:** Adopt an ordinance requiring strengthening and/or reinforcement of Unreinforced Masonry Buildings, except residential structures, considering the cost of the work and the value, frequency of use, and level of occupancy of the buildings.\*

### 3. PROTECTION FROM FLOOD HAZARDS

Footnote: "\*" = Mitigating Policy

### 3.1 FLOOD HAZARDS IN SONOMA COUNTY

Streams overflow banks when runoff from the watershed exceeds the capacity of the stream channel to carry it. Floods on small streams usually peak and recede quickly, while floods on the lower Russian River may not peak for two days or more after the start of a storm and may exceed floodstage for four days or more.



Flooding can move or destroy buildings and wash away soil, crops, and loose objects. Floating debris is a very dangerous hazard. Flood damage may weaken building materials and increase mildew, dust, bacteria and other disease vectors. Public facilities, roads, and services may also be affected. A particular concern is the disruption of sewage treatment facilities and resulting water quality impacts.

### 3.2 PLANNING ISSUES

#### Assessment of Hazards and Risks

The Federal Emergency Management Agency (FEMA) and Federal Insurance Administration have assessed flood hazards for most major streams in the County. These assessments are periodically updated to reflect new data from flood studies and actual events. The flood hazard areas include those areas that would be inundated by the 100-year flood event, defined by FEMA as areas that have at least a one percent (1%) chance of being flooded in any year. The area inundated by the 100-year flood is referred to as the Special Flood Hazard Area (SFHA) and the 100-year floodplain. The FEMA maps depict these areas and are commonly used as the primary source of flooding information for planning and development review and floodplain management. The current boundaries of these areas are shown on Figure PS-1e.

#### Flood Prevention and Control

Construction of dams and other improvements to detain stormwater is one way to reduce flood hazards. Flood levels in the Russian River basin have been reduced by Coyote Dam and Warm Springs Dam constructed by the U.S. Army Corps of Engineers. Flooding in Santa Rosa Creek and its branches has been reduced by five small dams. Flooding in the Payran Area of Petaluma Creek has been reduced by the Army Corps of Engineers construction of channel improvements. However, dams and structural improvements are costly, take a long time to complete, increase sediment buildup, may have impacts on the stream channel environment, and may give a false sense of security to floodplain residents. Future flood control activities may include

Footnote: "\*" = Mitigating Policy  
**PS-7**

improvements to drainage channels and management of sediments to reduce deposition in stream beds, particularly in light of new water quality regulations.

### **Floodplain Management**

Flooding may also be reduced by proper siting of development and watershed management, retention basins, and similar measures to decrease runoff. These methods reduce the need for costly construction projects and disaster relief. Land uses that can sustain periodic flooding and that decrease flood hazards downstream are encouraged in floodplains. Unincorporated communities with some development in designated floodplains include Guerneville, Monte Rio, Penngrove, Geyserville, Glen Ellen, Cazadero, and Schellville.

Floodplain management is required by Federal and State law. Various incentives such as flood insurance, loans, and state funding of flood control projects are offered if flood management practices are followed. Floodplain management can take many forms. It may include specified land uses and development standards in floodplains, flood hazard area mapping and zoning, acquisition of flood hazard areas, public education and outreach, and increased stormwater retention in the watershed.

In Sonoma County, implementation of floodplain management has reduced flood damage, primarily by limiting the kind and extent of new construction in FEMA identified special flood hazard areas and by elevating existing structures above flood elevations. However, flood damage is still a major and persistent problem in the Russian River, the Petaluma River, and, to a lesser degree, Sonoma Creek. Sonoma County is one of the highest repetitive loss communities in the nation, indicating that a more proactive approach is needed.

Chapter 7b of the County Code was adopted to reduce flood hazards in the 100-year flood plain. It regulates development through a permit review process and established review requirements and performance standards and restrictions in conformance with FEMA's National Flood Insurance Program (NFIP) regulations. The ordinance addresses the construction, location, extension, conversion, or alteration of structures or land in special flood hazard areas. These regulations apply to both new development and construction and modifications or repair of existing structures. FEMA determined the ordinance to be in full compliance with the NFIP. As such, the General Plan Public Safety Element has been implemented and is enforced on an ongoing basis.

In the Russian River basin, the development of a long-term plan for reducing repetitive flood losses would focus efforts on existing structures most vulnerable to damage. In the Petaluma watershed, the City of Petaluma has been studying various measures to manage flooding. These studies have revealed the sensitive nature of the Petaluma River system to changes in the timing of storm runoff. In response, the City has developed a watershed based model to account for the complex hydrology and to determine the best approach for flood management. Detention of stormwater runoff in the upper watershed is considered an important component of flood management in this system. The City has identified the need to preserve and enhance the

Footnote: "\*" = Mitigating Policy

natural flood detention capacity, particularly along the headwaters of the Petaluma River outside the City limits, as a key element of reducing flood hazards in the City.

### **3.3 REDUCTION OF POTENTIAL DAMAGE FROM FLOODING**

**GOAL PS-2:** Reduce existing flood hazards and prevent unnecessary exposure of people and property to risks of damage or injury from flood hazards.

**Objective PS-2.1:** Maintain complete data on flood hazards.

**Objective PS-2.2:** Regulate new development to reduce the risks of damage and injury from known flooding hazards to acceptable levels.

**Objective PS-2.3:** Use the Sonoma County Hazard Mitigation Plan to help reduce future damage from flood hazards.

**The following policies, in addition to those in the Open Space and Resource Conservation, Water Resources, and Land Use Elements, shall be used to achieve these objectives:**

**Policy PS-2a:** Maintain available information on flooding and flood hazards in the appropriate County departments.\*

**Policy PS-2b:** Coordinate flood hazard analysis and management activities with the U.S. Army Corps of Engineers, Federal Emergency Management Agency (FEMA), and other responsible agencies. Using the flood data collection program, request changes in FEMA maps where appropriate to reflect new data or analyses.\*

**Policy PS-2c:** Participate with the City of Petaluma in implementation of the regional components of the Petaluma River Watershed Master Drainage Plan (Sonoma County Water Agency, June 2003), Petaluma River Floodplain Management Plan (City of Petaluma, October 2001), Petaluma River Access and Enhancement Plan (City of Petaluma, May 1996), and City of Petaluma General Plan 2025 (Water Resources Element).\*

**Policy PS-2d:** Work with the County Community Development Commission, County Department of Fire and Emergency Services, responsible agencies, public, and other stakeholders to develop and implement a long-term plan for reducing repetitive flood losses in the Russian River basin, to include:

- (1) Systematic collection of flood data and damage by geographic location;
- (2) Consideration of acquisition of properties in flood hazard areas;

Footnote: "\*" = Mitigating Policy  
**PS-9**

- (3) An ongoing Flood Elevation Program;
- (4) A Sonoma County Flood Mitigation Plan, including a Repetitive Loss Plan, to allow County participation in FEMA's Flood Mitigation Assistance (FMA) Program and additional Hazard Mitigation Grant Program (HMGP) grants;
- (5) Possible participation in the National Flood Insurance Program's Community Rating System;
- (6) Use of Redevelopment funds to supplement FEMA grant funds in reducing repetitive flood losses; and
- (7) Consideration of permit fee reductions for elevation of structures in flood hazard areas and outreach to inform property owners in flood hazard areas about various options for coverage under the National Flood Insurance Program, including Increased Cost of Compliance (ICC) coverage.\*

**Policy PS-2e:** Expand the County's zero net fill requirements to address all areas of the unincorporated County that are located within the 100-year FEMA special flood hazard area.\*

**Policy PS-2f:** Preserve floodplain storage capacity by avoiding fill in areas outside of the 100-year FEMA special flood hazard area that retain or could retain flood waters.\*

**Policy PS-2g:** Base land use planning and development review on FEMA maps and data or parcel specific scaled interpretations of these maps and site specific elevation data.\*

**Policy PS-2h:** Work cooperatively with each City to prepare a comprehensive analysis of the potential flood hazards and drainage impacts for the watersheds with major flood problems in the County (i.e., Russian River, Sonoma Creek, and Petaluma River). Include the following in the analysis:

- (1) Identification of flood hazard areas;
- (2) Identification of historic drainage patterns and existing retention/detention characteristics serving each watershed;
- (3) Identification of impacts associated with placement of significant new impervious surfaces;
- (4) Identification of downstream impacts on existing development and land uses;
- (5) Identification of mitigation measures to reduce flood hazards;
- (6) Identification of significant water recharge areas;

Footnote: "\*" = Mitigating Policy

**PS-10**

- (7) Identification of sources of significant soil sedimentation and/or stream bank failures; and
- (8) Identification and adoption of regional mitigation measures to be applied to new development to address the proportionate fair share of flood hazard reduction.\*

**Policy PS-2i:** Until such time as the analysis under Policy PS-2h is completed and the regional mitigation measures adopted, each discretionary project located in the above watersheds with major flood problems shall analyze drainage and flooding impacts and include feasible and appropriate mitigation measures to reduce flood hazards from the project. Thereafter, each project shall implement its proportionate fair share of the regional mitigation measures.\*

**Policy PS-2j:** Work with the City of Petaluma to preserve critical floodplain detention areas, including but not limited to the confluence of Willow Brook and Lichau Creeks and Liberty, Marin, and Wiggins Creeks north of Petaluma.

**Policy PS-2k:** Use the 100-year flood event and corresponding elevations as the County measure of acceptable level of risk and protection in the consideration of any amendments of the Land Use Map.\*

**Policy PS-2l:** On-site and off-site flood related hazards shall be reviewed for all projects located within areas subject to known flood hazards.\*

**Policy PS-2m:** Regulate development, water diversion, vegetation management, grading, and fills to minimize any increase in flooding and related damage to people and property.\*

**Policy PS-2n:** Consider developing regulations that require the use of low impact development techniques to reduce stormwater runoff from future development.\*

**Policy PS-2o:** Costs for drainage facilities to handle the surface runoff from new development shall be the responsibility of the new development.\*

**Policy PS-2p:** Require that design and construction of drainage facilities be subject to the review and approval of the Permit and Resource Management Department.\*

**Policy PS-2q:** Require that tentative and final subdivision maps and approved site plans show areas subject to flooding as shown on the FEMA maps.\*

**Policy PS-2r:** Give priority to floodplain management over flood control structures for preventing damage from flooding except where the intensity of development requires a high level of protection and justifies the costs of structural measures. Where possible, maintain flood channel capacity.\*

**Policy PS-2s:** Consider the potential risk of damage from flooding in the design and review of projects, including those which could facilitate floodplain development.\*

**Policy PS-2t:** Avoid variances to building setbacks along streams and in 100-year flood plains without the review and approval of the Permit and Resource Management Department.\*

**Policy PS-2u:** Request that the Sonoma County Water Agency prioritize and undertake flood hazard mitigation projects on a continuous basis on selected waterways subject to the policies of the Open Space and Resource Conservation Element.\*

**Policy PS-2v:** Continue to enforce County code requirements on construction in flood hazard areas and other adopted regulations which implement the National Flood Insurance Program.\*

**Policy PS-2w:** Encourage the timely completion and filing of inundation maps for all dams whose failure could cause loss of life or personal injury within Sonoma County. Where inundation maps indicate dam or levee failure could cause loss of life or property or personal injury, coordinate with the corresponding responsible party to investigate levee or dam stability and management and identify rehabilitative maintenance needs as appropriate.\*

## 4. PROTECTION FROM WILDLAND FIRE HAZARDS

### 4.1 WILDLAND FIRE HAZARDS IN SONOMA COUNTY

The combination of highly flammable fuel, long dry summers and steep slopes creates a significant natural hazard of large wildland fires in many areas of Sonoma County. Wildland fire results in death, injury, economic losses, and a large public investment in firefighting efforts. Woodlands and other natural vegetation are destroyed resulting in the loss of timber, wildlife habitat, scenic quality, and recreation. Soil erosion, sedimentation of fisheries and reservoirs, and downstream flooding can also result.

Most damage results from a few large fires in the dry weather months. Since 1964, there have been 14 wildland fires in the County over 300 acres in size which burned a total of over 125,000 acres.



Residences have increased the number of fires in hazardous rural areas. 97% of the wildland fires over 50 acres since 1989 were caused by human activities or facilities. Residences in rural areas cause fire suppression agencies to devote limited resources to structural protection while the wildfire spreads.

The probability of large damaging fires in urban areas is affected by weather conditions and the spread of fires in surrounding wildland areas. The type of construction, preventive measures, and the extent of fire suppression services are the chief factors which determine how far these fires spread.

Footnote: "\*" = Mitigating Policy

**PS-12**

Primary responsibility for preventing and suppressing wildland fires in the County is divided between local firefighting agencies and the State as shown on Figure PS-1g. Local firefighting agencies have the primary responsibility in areas designated within a "Local Responsibility Area" (LRA). The California Department of Forestry and Fire Protection (CalFire) has the primary responsibility in those areas designated as a State Responsibility Area (SRA). The majority of the County is in the Sonoma-Lake-Napa Unit SRA, and fire management efforts are guided by the Sonoma Lake Napa Unit Fire Management Plan.

There are 40 different local firefighting agencies. These include city fire departments, independent districts, and volunteer fire companies. The County's Fire and Emergency Services Department provides fire protection, rescue, emergency medical, fire prevention, code enforcement, and arson investigation services for volunteer fire companies in the unincorporated areas of the county (County Service Area #40). The Department is responsible for fire prevention and code enforcement services to enforce the California Fire Code and other fire-related codes and ordinances. It enforces vegetation management by private property owners in all new development in State Responsibility Areas. It reviews building construction plans and performs inspections of new construction for fire code compliance.

The following plans for reducing wildland fire hazards are incorporated into this Element by reference:

**Sonoma County Hazard Mitigation Plan (SCHMP).** The SCHMP was first adopted by the Board of Supervisors on October 27, 2006. A five-year update of the SCHMP was adopted in October 2011. The SCHMP contains specific priority action items (referred to as mitigation actions) for wildfire hazards and more general priority action items for all types of hazards including wildfire.

**Vision 2020 County Strategic Fire Plan.** Adopted by the Board of Supervisors in October 2010, the Strategic Fire Plan contains recommended actions for improving and maintaining delivery of community based fire suppression, rescue, and emergency medical services in County Service Area #40 (CSA #40) over a ten-year period. These recommended actions are based on the recommendations contained in the County CSA #40 Fire Services Analytical Review presented to the Board of Supervisors in August 2009.

**Sonoma County Community Wildfire Protection Plan (CWPP).** Through Fire Safe Sonoma, the Sonoma County Fire and Emergency Services Department is preparing a Community Wildfire Protection Plan (CWPP), and anticipates it will be adopted by the Board of Supervisors in 2016. A CWPP addresses local forest and fuel conditions, identifies areas of wildland/urban interface identifies environmental and development values at risk, and contains recommendations and priorities for measures that a community and/or individuals can take to reduce fuel loads and decrease the risk of structural damage and personal injury from wildland fires.

Footnote: "\*" = Mitigating Policy

## 4.2 PLANNING ISSUES

### Assessment of Hazards and Risks

CalFire has assessed the wildland fire hazard in different areas of the county based on a consideration wildland fuels, terrain, weather, and other relevant factors. Wildland fuels or vegetation are the basic catalyst that supports the combustion process of wildfires. The various fuels have specific characteristics which allow fire behavior analysts to categorize them based on how they burn. Figure PS-1g is based upon CalFire's mapping and indicates the lands with Moderate, High, and Very High Fire Hazard Severity Zones as described below. However, such mapping provides only a general picture of the actual fire hazard because there may be local variations in vegetation, slope, and other factors which influence fire. The term "fire behavior" is used to describe the magnitude, direction, and intensity of fire spread.

- The **Moderate Fire Hazard Severity Zone** includes: a) wildland areas of low fire frequency supporting modest fire behavior; and b) developed/urbanized areas with a very high density of non-burnable surfaces and low vegetation cover that is highly fragmented and low in flammability.
- The **High Fire Hazard Severity Zone** includes: a) wildland areas supporting medium to high fire behavior and roughly average burn probabilities; and b) developed/urbanized areas with more limited non-burnable surfaces and moderate vegetation cover.
- The **Very High Fire Hazard Severity Zone** includes: a) wildland areas supporting high to extreme fire behavior resulting from by well developed surface fuels and forests where fire in tree crowns (portions of trees above the trunks) is likely; and b) developed/urbanized areas with high vegetation density and fuel continuity, allowing flame to spread over much of the area with little impediment from non-burnable surfaces. Additional site elements include steep and mixed topography and seasonally extreme conditions of strong winds and dry fuel moistures. The highest fire hazard is found in mountainous areas with dry summers, plenty of fuel, and steep slopes.

The County Hazard Mitigation Plan provides a more detailed assessment of risk and vulnerability to wildland fires.

### Land Use Planning

In order to reduce the risk of fire damage in rural areas, the types and intensities of land uses should be limited. Wildland fire hazards cannot be eliminated entirely but may be reduced by mitigation measures including vegetation management to reduce fuel loads, installation of

Footnote: "\*" = Mitigating Policy

dependable water systems, and participation in Community Wildfire Protection Plans. Rural development should be most restricted where natural fire hazards are high, fire protection is limited, and road access prevents timely response by firefighting personnel and rapid evacuation by residents. The adopted General Plan land use densities help achieve this condition by applying low densities to the areas with high wildland fire hazards.

The California Environmental Quality Act requires, prior to taking any action on a discretionary project proposal, that the lead approval agency assess whether a proposed project would expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. The County's zoning code provides the discretionary authority to condition project approvals. Projects must be found consistent with the Public Safety Element goals with respect to wildland fires. The discretionary approval process also provides opportunities for firefighting agencies to provide recommendations which may also be incorporated into permit approvals or denials.

The County's subdivision rules, set forth in Chapter 25 of the Sonoma County Code, regulate the division of land and define minimum lot sizes, densities, and development standards. The subdivision standards require providing a water storage facility for fire protection and a fire management plan that identifies fire hazards on the site and necessary protection measures. The rules also include a number of road standards to assure adequate access for emergency vehicles.

### **Development Standards**

Fire hazard regulations are intended to minimize on-site property damage and personal injury, avoid damage to adjacent properties, and reduce the cost of fire suppression services. Increasing "built-in" fire protection in those areas where new construction is allowed is the most cost effective way to achieve these objectives. All development must have adequate water available for fire suppression, whether from a hydrant and community system or from an on-site storage tank.

Where development is permitted near wildlands and natural vegetation, the fire hazard must be further mitigated by other measures. The locations of subdivision lots and building envelopes can maximize access by emergency vehicles and minimize construction in steep or wooded areas. Fire retardant roof materials are now required in high fire hazard areas. Preventing the spread of wildland fires to and from structures also requires establishing defensible space around each structure through management of surrounding vegetation and clearing of fuel breaks.

The County implements the fire safety standards of the Uniform Fire Code, National Fire Code, and Uniform Building Code through implementation of the Sonoma County Fire Safety Ordinance (Chapter 13 of the County Code), often referred to as the "Fire Safe Standards." It establishes minimum fire safe standards to ensure that all new development within the unincorporated area of the county will provide a basic level of fire protection around itself making it easier and safer

Footnote: "\*" = Mitigating Policy

for fire fighters to fight wildland and structure fires. The Fire Safe Standards include requirements for emergency access, minimum emergency water supply, fuel modification and defensible space, sprinklers, and road naming and addressing. The County's Fire Safe standards are more stringent than those required by the California Fire Code.

In addition, all new residential, commercial, and industrial construction in State Responsibility Areas must follow the regulations established by the State Board of Forestry pursuant to Section 4290 of the Public Resources Code. These regulations are set forth in Section 1270 of Chapter 7 of Division 1.5 of Title 14 of the California Code of Regulations and include road standards for fire equipment access; signage standards to identify streets, roads, and buildings; requirements for private water supply for emergency fire use; and requirements for fuel breaks.

Public Resources Code Section 4291 requires that a person who owns, leases, controls, operates, or maintains a building or structure in or adjoining a mountainous area, forest covered lands, brush covered lands, or grass covered lands shall maintain a defensible space of 100 feet from all sides of the structure, but not beyond the property line. Proper clearance to 100 feet dramatically increases the chance of a house surviving a wildfire much more than the previous 30-foot clearance requirement. The Code also specifies building code standards and requires the local building code official to certify that the structure design adheres to the current building code. Chapter 7A of the California Building Code requires new buildings in a Very High Fire Hazard Severity Zone, a designated Wildland Urban Interface (WUI) Zone, or otherwise in a State Responsibility Area to use ignition resistant construction methods and materials.

Another important component of fire safety is an improved system of street addressing throughout the County. Fire response time, particularly in rural areas, is occasionally affected by the ability of the responder to locate the affected address. Improved visibility and standardization of street addresses can result in reduced emergency response time.

### **Public Education**

Increased public awareness of fire hazards and fire safe practices is an effective way to avoid or reduce future fire damage and loss of life. Emergency service providers typically provide educational programs that focus on prevention. In addition to continuing to promote these ongoing programs, fire prevention information can be provided directly to the general public and to prospective permit applicants for incorporation into building design. Such a program can be further expanded to include fire hazard information by providing fire hazard warning signs along roadways in particularly vulnerable fire hazard areas.

Owners of properties in a Very High Fire hazard Severity Zone, or otherwise in a wildland fire area that may be exposed to wildland fire risks, must comply with natural hazards disclosure requirements at the time of property sale.

## **4.3 REDUCTION OF POTENTIAL DAMAGE FROM WILDLAND FIRE HAZARDS**

Footnote: "\*" = Mitigating Policy

- GOAL PS-3:** Prevent unnecessary exposure of people and property to risks of damage or injury from wildland and structural fires.
- Objective PS-3.1** Continue to use complete data on wildland and urban fire hazards.
- Objective PS-3.2:** Regulate new development to reduce the risks of damage and injury from known fire hazards to acceptable levels.
- Objective PS-3.3:** Use the Sonoma County Hazard Mitigation Plan to help reduce damages from wildland fire hazards.

**The following policies, in addition to those in the Land Use Element, shall be used to achieve these objectives:**

**Policy PS-3a:** Continue to use available information on wildland and structural fire hazards.\*

**Policy PS-3b:** Consider the severity of natural fire hazards, potential damage from wildland and structural fires, adequacy of fire protection and mitigation measures consistent with the Public Safety Element in the review of projects.\*

**Policy PS-3c:** Continue to adopt revisions to the Uniform Fire and Building Codes and other standards which address fire safety as they are approved by inspection organizations and the State of California. Review, revise, and/or adopt existing or new local codes, ordinances, and Fire Safe Standards to reflect contemporary fire safe practices.\*

**Policy PS-3d:** Refer projects and code revisions to the County Department of Fire and Emergency Services and responsible fire protection agencies for their review and comment.\*

**Policy PS-3e:** The County Department of Fire and Emergency Services shall offer assistance to local agencies in adoption and enforcement of fire safety regulations and shall work with local agencies to develop proposed improvements to County codes and standards.\*

**Policy PS-3f:** Encourage strong enforcement of State requirements for fire safety by the California Department of Forestry and Fire Protection.\*

**Policy PS-3g:** Encourage continued operation of California Department of Forestry and Fire Protection (CalFire) programs for fuel breaks, brush management, controlled burning, re-vegetation, and fire roads.\*

**Policy PS-3h:** Develop a program to improve and standardize the County street addressing system in order to reduce emergency service response times. Where applicable, coordinate the program with the cities.\*

**Policy PS-3i:** Encourage and promote fire safe practices and the distribution of fire safe educational materials to the general public, permit applicants, and local planning agencies.\*

**Policy PS-3j:** Provide fire hazard information signs in Very High or High Fire Hazard Severity Zones in a manner consistent with Area Plans and that does not degrade Scenic Corridors and scenic views.\*

**Policy PS-3k:** Work with the California Department of Forestry and Fire Protection (CalFire) to identify areas of high fire fuel loads and take advantage of opportunities to reduce those fuel loads, particularly in Very High or High Fire Hazard Severity Zones.

**Policy PS-3l:** Require automatic fire sprinkler systems or other on-site fire detection and suppression systems in all new residential and commercial structures, with exceptions for detached utility buildings, garages, and agricultural exempt buildings.\*

**Policy PS-3m:** Consider additional impact or mitigation fees, or a benefit assessment, to offset the impact of new development on fire services.

## 5. PROTECTION FROM HAZARDOUS MATERIALS

### 5.1 HAZARDOUS MATERIALS IN SONOMA COUNTY

Many man-made substances can be hazardous to health. The increased use of such materials has increased potential hazards and actual damage. Public concerns have led to tighter controls on the production, transport, storage, sale and use of hazardous materials and, particularly, on the handling and disposal of concentrated residues and wastes produced by power plants and other industrial operations.

Hazardous materials are found at many locations in Sonoma County. The electrical generating plants in the Geysers geothermal area use and produce hazardous materials hauled on winding mountain roads. Spills and releases of such materials have occurred.

Petroleum fuels get into ground water and surface water, particularly from underground tanks. Prevention of hazardous materials in the County's solid waste landfills and transfer stations and industrial operations is important because these materials could affect water quality.



Pesticides are another hazardous material commonly used in Sonoma County, by agricultural operations as well as residential and commercial land uses. While State law preempts local

Footnote: "\*" = Mitigating Policy

**PS-18**

regulation of pesticides, the County does have the authority to establish restrictions on use of hazardous materials applicable to its own governmental operations. By doing so, the County can set an example that will encourage others to reduce reliance upon these materials.

## 5.2 PLANNING ISSUES

The management of hazardous materials is included in this Element because it has become a major public safety issue requiring significant resources and attention by local agencies.

While different agencies have different responsibilities in the regulation of hazardous materials, the Department of Fire and Emergency Services has been designated as the lead agency for preparation of a comprehensive hazardous materials management plan, including the County Hazardous Waste Management Plan.

## 5.3 REDUCTION OF POTENTIAL DAMAGE FROM HAZARDOUS MATERIALS

**GOAL PS-4:** Prevent unnecessary exposure of people and property to risks of damage or injury from hazardous materials.

**Objective PS-4.1:** Maintain complete documentation and assessments of data on hazardous materials.

**Objective PS-4.2:** Regulate the handling, storage, use, and disposal of hazardous materials in order to reduce the risks of damage and injury from hazardous materials

**The following policies shall be used to achieve these objectives:**

**Policy PS-4a:** While maintaining the autonomy granted to it pursuant to State zoning laws, implement Federal, State, and County requirements for the storage, handling, disposal, and use of hazardous materials, including requirements for management plans, security precautions, and contingency plans.\*

**Policy PS-4b:** Prepare and maintain an inventory of sites with storage or use of hazardous materials in threshold planning quantities as determined by Federal and State laws.\*

**Policy PS-4c:** Require a use permit for any commercial or industrial use involving hazardous materials in threshold planning quantities as determined by Federal and State laws. Hazardous materials management plans shall be required as a condition of approval for such permits.\*

**Policy PS-4d:** Work with applicable regulatory agencies to regulate the transportation of hazardous materials consistent with adopted County policies.\*

**Policy PS-4e:** Continue to design and operate County owned solid waste disposal facilities to prevent disposal of and contamination by hazardous materials.\*

**Policy PS-4f:** Continue as needed the hazardous materials business advisory group, and consider adding an agricultural representative.\*

**Policy PS-4g:** Maintain the Sonoma County Operational Area Hazardous Materials Incident Response Plan, which provides for effective responses to releases of hazardous materials, the safe disposal of hazardous wastes, and a public information program.\*

**Policy PS-4h:** Avoid siting of hazardous waste repositories, incinerators, facilities that use a substantial quantity of hazardous materials, or other similar facilities intended primarily for hazardous waste disposal in any area subject to a very strong ground shaking hazard identified on Figures PS-1a through PS-1i or within one quarter mile of schools.\*

**Policy PS-4i:** Avoid siting of hazardous waste repositories, incinerators, or similar facilities intended primarily for hazardous waste disposal in any area designated for urban residential or rural residential use or on agricultural lands or at County approved solid waste disposal facilities.\*

**Policy PS-4j:** Site hazardous waste facilities which have the primary purpose of reuse, recycling, or source reduction of hazardous wastes in areas designated for industrial use in close proximity to users of hazardous materials and/or generators of hazardous wastes.\*

**Policy PS-4k:** Continue to educate the public about and promote the Sonoma County Waste Management Authority's Household Hazardous Waste Program. Encourage free drop-off and reuse of computers and similar equipment containing hazardous materials.\*

**Policy PS-4l:** Continue to educate the public about green business opportunities and expand and promote the County Department of Fire and Emergency Services Sonoma Green Business Program.\*

**Policy PS-4m:** Continue to educate the public about, encourage, and promote the reduction in use of hazardous materials and the use of safe alternatives to hazardous materials in County operations and private businesses.\*

**Policy PS-4n:** Encourage the private sector to reduce the use of potentially hazardous pesticides and to use alternatives such as best management practices.\*

**Policy PS-4o:** Encourage reduction in the use of potentially hazardous pesticides and increased use of alternatives, such as best management practices, in County operations, including but not limited to maintenance of roads, parks, and facility grounds. Emphasize the use of alternatives to potentially hazardous pesticides in areas likely to drain to waterways. Coordinate with the cities in this effort.\*

Footnote: "\*" = Mitigating Policy

## **6. PUBLIC SAFETY IMPLEMENTATION PROGRAM**

### **Public Safety Program 1: Safety Hazards Information System**

Program Description: Log and maintain records of all mapping and reports regarding geologic and flood hazards information prepared for project applications and by other sources. Use the information in assessing constraints (Policy Reference: PS-1a, 1b, 1c, 2a, 2b).

### **Public Safety Program 2: Drainage, Erosion, & Fire Safety Standards for Subdivisions**

Program Description: Prepare amendments to Chapter 25 of the Sonoma County Code to clarify standards for drainage, erosion control, and fire safety (Policy Reference: PS-2n, 2v, 3c).

### **Public Safety Program 3: Hazard Materials Incident Response Plan**

Program Description: Maintain the Sonoma County Operational Area Hazardous Materials Incident Response Plan addressing prevention of and response to releases of hazardous materials and the proper disposal of hazardous wastes (Policy Reference: PS-4g).

### **Public Safety Program 4: Fire Sprinkler Ordinance**

Program Description: Prepare and adopt an ordinance requiring automatic sprinkler or other on-site fire detection and suppression systems in new residential and commercial structures (Policy Reference: PS-3l).

### **Public Safety Program 5: Public Facility Recovery Plan**

Program Description: Develop a strategic plan for recovery of essential public facilities following disasters, particularly earthquakes (Policy Reference: PS-1n).

### **Public Safety Program 6: Unreinforced Masonry Buildings**

Program Description: Prepare and adopt an ordinance requiring strengthening and/or reinforcement of unreinforced masonry buildings, except residential structures, that would consider the cost of the work and the value, frequency of use, and level of occupancy of the buildings (Policy Reference: PS-1o).

**Public Safety Program 7: Reduction of Russian River Flood Damage**

Program Description: Develop a comprehensive plan addressing flood losses in the Russian River (Policy Reference: PS-2d).

**Public Safety Program 8: Zero Net Fill Ordinance**

Program Description: Prepare and adopt an ordinance addressing zero net fill requirements in all areas of the unincorporated County subject to the 100-year FEMA special flood hazard areas (Policy Reference: PS-2e).

**Public Safety Program 9: Reduction of Petaluma River Flood Damage**

Program Description: Cooperatively with the City of Petaluma, initiate a program to identify existing risks and implement regional flood reduction projects within the Petaluma Subbasin (Policy Reference: PS-2h).

**Public Safety Program 10: Street Addressing Improvements**

Program Description: Develop a program to improve countywide street addressing in order to reduce emergency response times (Policy Reference: PS-3h).

**Public Safety Program 11: Implement Sonoma County Hazard Mitigation Plan**

Program Description: Implement mitigation measures and actions identified in the Sonoma County Hazard Mitigation Plan to the degree possible based on their priority and available funding. Update the plan and monitor mitigation progress on an ongoing basis as required by law.

Footnote: "\*" = Mitigating Policy