Part 4 – ENVIRONMENTAL QUALITY

4000 The elements in this part describe certain environmental quality objectives and criteria that pertain throughout the planning area. Three elements are included in Part 4: the safety element, the conservation element, and the noise element.

Conservation Element

Introduction

4200 The lands and waters of Portola Valley and its planning area comprise nearly one-half of the headwaters of the San Francisquito Creek watershed and a substantial amount of the natural foothills and hillsides remaining on the Midpeninsula. The town and its residents are the stewards of these natural resources and should cooperate with surrounding jurisdictions on watershed management and regional conservation.

Runoff from many tributaries in the watershed become concentrated in the San Francisquito Creek as it passes through Palo Alto and discharges into the San Francisco Bay. Flooding of these lower lands is an ongoing concern of Palo Alto and neighboring communities. Efforts to minimize flooding problems and preserve the health of the system will continue through actions of federal, state and local agencies. Portola Valley is and will continue to be a participant in these endeavors.

The conservation element concerns four basic categories: water--creeks, ponds, ground water, and imported water; vegetation--both native and exotic; soils and geology; and wildlife. This division is for convenience only; the interrelationships of these resources should be recognized and cherished.

4201 The conservation element provides a programmatic approach for the conservation, restoration, development and utilization of natural resources. Some aspects of conservation programs can be accomplished solely through public efforts while others can only be effectuated by identifying self interests or appealing to the community spirit of the owners of private property within the town. This element is concerned with programs, requiring both public and private action, that will conserve and enhance the natural qualities of the planning area.

4202 The effective conservation, restoration, development and utilization of natural resources cannot be accomplished without professional study and evaluation of critical areas or needs. The conservation element generally describes those fragile areas of the ecosystem that must be protected. It provides, in addition, policies that will help ensure that in planning and development of specific land use proposals environmental impact is not overlooked, that conservation actions are considered, and that such evaluations and actions are sufficiently comprehensive in accordance with professionally established guidelines.

Definitions

4203 **Public Conservation Programs** are largely carried out by local govenments such as cities and counties. The town of Portola Valley can implement conservation measures through its regulatory powers including its zoning, subdivision and site development ordinances. Special districts as well as non-profit organizations also play roles. The Midpeninsula Regional Open Space District addresses conservation issues on land it owns in and adjoining the town. In addition, the Peninsula Open Space Trust, a non-profit trust, acquires land that will ultimately be retained as open space and held in a natural condition. Also included are those educational, technical assistance, incentive, acquisition and protective work programs that can be pursued by public agencies.

4204 **Private Conservation Programs** include protective work programs sponsored by private organizations and individual efforts for the conservation of natural resources on private sites. Private groups can, through the dissemination of conservation information, educate those unaware of environmental problem areas and, more importantly, values to be conserved. In addition, private dedication of conservation easements and/or financial donations for the protection of the natural processes would enhance all conservation efforts.

Objectives

4205 The conservation element includes: objectives, principles and standards; and a description of programs.

4206 For the objectives of the conservation element to be implemented, public and private efforts cannot be carried out in isolation of each other. It is the purpose of this element to provide a unified framework for the achievement of the conservation objectives.

4207 Water—Creeks, Ponds, Ground Water, and Imported Water

1. To protect the area against excessive storm water runoff, flooding, erosion and other related damage.

2. To protect natural ground water recharge areas.

3. To maintain standards to insure a high water quality.

4. To preserve the natural character of all watershed land.

5. To prevent obstructions to the natural flow of water that would adversely affect natural processes.

6. To maintain a healthy ecological system for plants and animals in and along all bodies of water.

7. To encourage the conservation of water resources.

8. To encourage the recycling of water, both domestic and imported.

4208 Vegetation—Both Native and Exotic

1. To minimize disturbance of the natural terrain and native vegetation.

2. To preserve and protect all native and naturalized plants with special attention to preservation of unique, rare or endangered species and plant communities such as oak woodland and serpentine grasslands.

3. To encourage the planting of native plant species as part of any site development for ecological, aesthetic and water conservation purposes.

4. To ensure that when changes in natural grades or removal of existing vegetation is required on any public or private project, remedial measures call for the restoration or introduction of native vegetative cover for ecological as well as erosion control purposes.

5. To ensure that all thoroughfares and local roads are designed and planned to preserve the natural beauty and character of the corridor to the maximum extent possible.

6. To encourage the planting of native trees and shrubs to provide a substantial buffer between roadways and adjoining properties in harmony with the general character of the town.

7. To encourage the removal and prevention of the spreading of aggressive exotics such as pampas grass, acacia, yellow star thistle, French broom, Scotch broom and eucalyptus.

8. To preserve and maintain an area of native vegetation along creek corridors in order to separate turf and impervious surfaces from the creeks.

9. To protect forests and other vegetation for their roles in helping maintain and improve air quality.

4209 Soils and Geology

1. To prohibit the quarrying of rock, sand and gravel, as such uses are incompatible with basic town objectives.

2. To prevent, control and correct the erosion of soil.

3. To prohibit the dumping of any waste material that may harm or destroy soil quality and character.

4. To encourage wise soil husbandry and soil enrichment with organic wastes and other soil building materials.

5. To limit, and where determined necessary for public safety, prohibit development in hazardous geologic areas.

6. To encourage agricultural uses on soils suited for agricultural purposes when appropriate.

4210 Wildlife

1. To ensure that in the design and construction of public and private developments, the habitat of all wildlife will be protected to the maximum extent feasible, with special emphasis on protecting the habitat of any endangered species.

2. To maintain and protect creek corridors for wildlife who use this resource for food, shelter, migration and breeding.

3. To protect large and small natural systems for the purpose of supporting wildlife.

Principles

4211 Water—Creeks, Ponds and Ground Water

1. Recognizing that we live in a semi-arid area with increasing demand on limited water supplies, water conservation methods must be a guiding principle in all land use planning.

2. Environmental impact reports or studies, prepared professionally, should be required of public and private projects that propose extensive grading or vegetation removal on watershed lands.

3. Dumping of waste materials into creeks or streams or within their established undeveloped drainage basins should be prohibited.

4. Use of agricultural fertilizers and chemicals in areas along creeks should be tightly controlled so as to avoid adverse impacts.

5. The town shall require that there be no significant alterations of stream channels or obstructions to the natural flow of water. Creeks should be maintained in their naturally meandering channels consistent with geomorphic processes. Where channels are damaged or property threatened, bank stabilization by biotechnical methods are preferable to engineered solutions such as concrete walls and similar structures.

6. The natural flow of streams should be maintained and not diverted for other uses.

7. To protect water quality, the town shall encourage development to maintain an undisturbed or enhanced protective buffer between all cut and fill slopes, non-native turf or areas under chemical management or impermeable surfaces, and any creek corridors.

8. To require management practices that will reduce the amount of pollution entering water bodies.

9. Development should be restricted in areas subject to flooding.

4212 Vegetation

1. Removal of native vegetation should be minimized, and replanting required where necessary to maintain soil stability, prevent erosion and maximize reoxygenation.

2. Forest resources should be protected from harvesting.

3. Mature native trees and shrubs should be conserved.

4. Plantings in public trail easements or public road rights of way shall be of native plants and trees and shall not interfere with the use of the easements for public purposes such as equestrians, hikers, pedestrians, bicyclists, runners and vehicles.

5. The town should encourage restoration of unique or rare vegetation and habitats.

6. Along creeks, indigenous vegetation should be protected and, where necessary, restored and enhanced.

7. Management of native vegetation for the purpose of fire safe management practices should be done only to the extent necessary to meet reasonable fire safety objectives while still seeking to protect the biologial resources of the environment.

4213 Soils and Geology

1. Zoning and other land use regulations should be used to limit, and in some cases prohibit, development in geologically hazardous areas. The degree of development limitation provided for in such regulations should be commensurate with the degree of hazard involved and the public costs likely to be incurred if emergency or remedial public action becomes necessary in these areas.

2. Land use regulations should allow for and encourage using the best soils for agriculture when appropriate.

4214 Wildlife

1. An environmental impact report or study, prepared by a qualified biologist, should be required to determine if the habitat of wildlife is being impacted, particularly of endangered species, by any proposed public or private project where such encroachment appears likely.

2. All subdivision and site development proposals should be reviewed to ensure that they do not obstruct wildlife access to important water, food and breeding areas.

3. Designate creek corridors as sensitive areas which provide important aquatic and terrestrial wildlife habitat. Setback requirements should be established by zoning for all new development along creeks. All new subdivisions and site development proposals should contain setback area sufficient to buffer wildlife inhabiting the creek corridor from the impacts of development.

4. Protect lands and habitat that support endangered or protected species wherever possible and consistent with state and federal requirements.

5. Give attention to restoring native habitat for wildlife when reviewing development proposals and initiating town projects.

Standards

4215 Specific standards are and will be included within the zoning, subdivision and site development ordinances.

Description

4216 Several conservation program areas are proposed. Each program area is based on conservation of the natural processes or ensuring public health and safety. Specific recommendations made are directed at the objectives of the four categories of concern: water (creeks, ponds, groundwater and imported water); vegetation (native and exotic); soils, geology; and wildlife.

4217 The program areas proposed are not meant to be the basis for the establishment and implementation of specific conservation programs in isolation of one another as the entire ecosystem is closely interrelated. They provide, rather, a unified framework for inter-relating action programs, projects, and other actions to ensure that conservation efforts will be of maximum efficiency and effectiveness.

4218 Each program area proposed could be designated as the responsibility of either the public or private sector; however, it is necessary for program implementation that all programs are understood and supported by both sectors. Further, conservation is dependent upon each individual's realization of his or her intimate relationship with the environment. All the public efforts are of limited value without citizen participation in protecting the environment.

Education

4219 Public education and information programs detailing conservation values and problem areas and providing guidance of protective actions should be organized and administered by town staff and elected and appointed officials in cooperation with schools at all levels. This would include, in addition, special public meetings and information sessions with established private clubs or groups. Private conservation groups can also play an important part in citizen education.

Regulation

4220 The natural character of Portola Valley can be conserved in large part by ensuring that new and existing development is controlled by suitable regulation – mainly zoning, subdivision and site development regulations. These regulations are applied by the town as part of its "police power," the right of government to enact laws which are in the public interest and which are directly related to the health, safety and general welfare of the community. Ordinances adopted in 1967 and as subsequently amended seek to preserve the natural setting. The zoning, subdivision and site development regulations provide much of the framework within which the town will develop and are sufficient to achieve many of the objectives of the conservation element by ensuring that development projects are always considered in the context of conservation of the environment and that conservation easements are dedictated when appropriate. The regulations should include control over development in areas where natural hazards exist. These regulations will only achieve the objectives with careful and imaginative guidance by town staff, elected representatives and citizens.

4221 The town has established special setbacks along the major creeks in the town, which are: Los Trancos Creek, Corte Madera Creek and Sausal Creek. The purposes of the setbacks are to improve the quality of creekbank protection measures, reduce risk to property improvements, protect scenic values and protect the riparian habitat important to wildlife. Administration of these provisions by town officials and staff will be a major factor in protection of these important habitats.

4222 The town is served by septic systems and sewers. The comparative merits of these two methods of sewage disposal should be studied further.

4223 The town's report "Portola Valley Sensitive Biological Resources Assessment and Fuel Hazard Assessment" dated 2008 and 2010, includes GIS maps of vegetation, soils and fire hazard and also provides extensive technical information on native vegetation. Guidelines for protecting habitat are included and should be consulted regularly by planning staff and decision-making bodies in conjunction with the review of development proposals. Futhermore, the report includes guidelines for protecting biological resources when undertaking vegetation management for the purpose of fire hazard mitigation.

4224 The implementation of this element with regard to water resources shall be coordinated with any countywide water agency and other agencies that have developed, served or conserved water for any purpose for the town.

Acquisition

4225 There are cases where regulation will not provide a basis for achieving conservation objectives. In these situations, a town program for acquisition may be needed. There are two basic types of land ownership – full or fee title, and partial title, such as through a conservation easement or ownership of development rights. For a discussion of acquisition, see Appendix 6: Implementation of the Open Space Element.

Incentives

4226 For effective conservation of natural resources, a program of public incentives should be considered. Incentives in the form of tax relief or some other financial form (e.g., Williamson Act, income tax allowance for gifts, etc.) could be used for the conservation of large areas critically important to natural processes. Changes in this type of incentive would require a higher level of public involvement (state and federal legislation) to increase flexibility at the local level. The town has already adopted policy in favor of such incentives now permitted at the local level. Incentives could also take the form of allowing modification of normal regulations for special conservation considerations by the property owner or developer.

Technical Advice

4227 Professional technical advice is essential for full understanding of the natural processes. As noted above, the town's report "Portola Valley Sensitive Biological Resources Assessment and Fuel Hazard Assessment" dated 2008 and 2010 provides detailed mapping of vegetation in the town along with lists of endangered and threatened species associated with such vegetation. A system for applying the information in the planning program and in particular when reviewing development proposals should be developed.

4228 The town has adopted a Geologic Map and Ground Movement Potential Map along with an implementing policy statement and zoning ordinance provisions. These documents provide significant guidance in helping ensure the safety of developments in areas subject to landslides and other geologic hazards and also in avoiding damage to the natural environment including erosion and flooding. This information will guide public decision makers and should be available to the private sector for both education and advice.

4229 Information on available professional services and sources of professional advice including county, state and federal agencies, professional societies, conservation groups, and appropriate local professionals (e.g., landscape architects, geologists, biologists and hydrologists) should be made available

at the Portola Valley town hall and through the town library and public schools within the town as well as at the high school and community college levels.

Remedial Work Programs

4230 Remedial work programs directed at specific conservation problem areas can prevent irreversible damage to the environment. Also, programs requiring organized private group efforts, clean up campaigns, etc., can help to improve the environment and bring people together in a common effort. Town sponsored projects such as litter removal and removal of invasive vegetation, as well as other programs, can make a substantial contribution to the conservation of the environment.

Miscellaneous Private Efforts

4231 For the conservation program to be effective, individual, organized and unorganized private efforts are necessary. These efforts include individual lot maintenance to high standards based on the preservation of the natural character (e.g., care in controlling site drainage, use and control of exotic plants to prevent widespread weed growth, etc.), dedications of conservation easements and financial donations with the requirement that they be spent for the protection of the natural processes.

Table 1. Guide to Park, Recreation, and Open Space Proposals in the General Plan

Park, Recreation or Open Space	***Park and Recreation Element***	***Open Space Element***	***Trail & Path Element***	***Scenic Roads and Highways Element***	***Land Use Element***
Neighborhood Preserve	-	X			
Neighborhood Park	X				
Community Preserve	-	X			
Community Park	X				
Other Community Parks or Preserves	X	X			
Regional Park or Private Regional Facility	X	X			
Open Space Preserve		X			
Scenic Corridor	-	X			
Greenway	-	X			
Open Space Limited Development		X			
Agricultural Lands		X			
Secondarily Park, Recreation, or Open Space*					
Residential Open Space Preserves					X
Trails and Paths			X		
Scenic Roads and Highways				X	
* These land use categories serve primarily for residential or circulation purposes, but have secondary uses as parks, recreation areas, or open spaces.					

Safety Element

Introduction

Purpose

4100 The safety element presents: 1) an identification and evaluation of geologic and fire hazards in the Portola Valley planning area, 2) a statement of official Portola Valley town policy for the avoidance, reduction or abatement of those hazards, and 3) guidelines for disaster response. The basic purpose of the element is to provide a policy basis for measures the town should take to prevent loss of life, reduce injuries and property damage, and minimize economic and social dislocations which could result from earthquake, conflagration and certain other natural hazards.

Scope

4101 The element deals with the potential geologic and fire hazards to persons and property in the planning area. Thus, geologic and fire hazards are treated while such hazards as wind storm, lightning, falling trees, unsafe structures, motor vehicle accidents and crime (including theft, threats to personal safety and vandalism) are not included. These other hazards are dealt with to some degree in other elements of the general plan. In addition, town regulations and state laws provide public policy and regulate conduct in relation to a wide range of hazards. The town should determine the further extent to which the powers and resources of town government could be utilized to improve public safety. Specific hazards could be ranked in relation to impact, efficacy of present programs, and costs. The basic question is: How can town powers to inform, regulate or provide facilities and services be more beneficially applied (in a cost-effective sense) to

increase public safety without unduly infringing upon personal freedom of choice and action?

Definitions

4102 The following definitions of technical terms are used in this element of the general plan:

1. **Hazard:** a source of danger, peril or jeopardy.

2. **Risk:** the chance of injury, damage or loss.

3. **High Risk:** high probability of property loss and/or personal injury.

4. **Seismic:** pertaining to or caused by an earthquake.

5. **Fault:** a plane or surface in earth materials along which shear failure has occurred and materials on opposite sides have moved relative to one another in response to the accumulation of stress in the rocks.

6. **Active Fault:** a fault that has moved in recent geologic time (10,000 years m.o.l.) and which is likely to move again in the relatively near future.

7. **Inactive Fault:** a fault which shows no evidence of movement in recent geologic time and which is inferred to have little potential for movement in the relatively near future.

8. **Fault Zone:** a zone of related faults which commonly are braided and sub-parallel, but which may be branching and divergent. Its width ranges from a few feet to several miles.

9. **Fault Trace:** the intersection between a fault plane and the ground surface. It is graphically portrayed as a line plotted on geologic maps.

10. **"Maximum Probable" Earthquake:** the greatest magnitude earthquake which can reasonably be expected to occur in a particular area.

11. **Ground Failures:** includes landslide, soil liquefaction, lurch cracking*, surface faulting, ground settlement, lateral spreading*, soil creep, soil expansion.

* Not considered to be a significant hazard in Portola Valley, but if new information reveals problems of public concern, the element should be expanded to address the

12. **Soil Liquefaction:** change of water-saturated cohesionless soil to fluid-like state usually from intense ground shaking; soil loses strength and flows as a liquid.

13. **Landslide:** the downslope movement of masses of earth material along a slip surface.

14. **Active Landslide:** a landslide which is moving or shows signs of movement within historic time.

15. **Ancient Landslide:** a landslide deposit which does not show signs of having moved within historic time.

16. **Landslide Deposit:** earth materials which have been deposited through the process of landsliding.

San Mateo City-County Planning Task Force Report

4103 During 1974-75, Portola Valley cooperated with the other cities in San Mateo County and the county in the preparation of a draft seismic and safety element. The county draft provides a broad setting for the Portola Valley element and includes matters which could later provide a basis for modifications to the Portola Valley element. The draft county element is in two volumes as follows: *Seismic and Safety Elements of the General Plan, Volume One: Goals, Policies and Programs; Volume Two: Technical Supplement.*

Goals

4104 The basic goals of the Town of Portola Valley in adopting this element of the general plan are to prevent loss of life, to reduce injuries and property damage and to minimize economic and social dislocation which may result from earthquakes, other geologic hazards and fires.

Objectives

4105 The objectives of the Town of Portola Valley in adopting this element of the general plan are:

1. To define the relative degree of risk in various parts of the planning area so that this information will be used as a guide for minimizing or

hazard.

avoiding risk for new construction and for risk abatement for existing development.

2. To minimize the risk to human life from structures located in hazardous areas.

3. To provide a basis for designating land uses which are appropriate to the geologic and fire risks of the various portions of the planning area.

4. To ensure that facilities whose continuing functioning is essential to society, and facilities needed in the event of emergency, are so located and designed that they will continue to function in the event of fire or natural disaster.

5. To facilitate post-disaster relief and recovery operations.

6. To increase public awareness of geologic and fire hazards, and of means available to avoid or mitigate the effects of these hazards.

Principles

4106 The following principles are intended to guide the town and private parties in future actions.

1. Land uses should be controlled to avoid exposure to risk in excess of the level generally acceptable to the community (defined in this element as "Acceptable Risk").

2. Locate development, to the maximum extent feasible, should avoid areas which present high risk exposure.

3. Development in hazardous areas should be limited to structures and improvements which would not threaten human life or cause substantial financial loss if damaged, or the development or site should be engineered to mitigate the hazard.

4. Where utility lines and roads are located in or cross high hazard areas, all reasonable measures should be taken to insure continuity or quick restoration of service and prevention of secondary hazards such as fire or flood.

5. High hazard areas should not be subdivided unless and until adequate mitigating measures are assured.

6. Critical facilities, such as major transportation links, communications and utility lines and emergency shelter facilities, should be located, designed and operated in a manner which maximizes their ability to remain functional after a disaster.

7. New structures should be designed and constructed to withstand, within levels of acceptable risk, the hazards known to exist at their locations.

8. Additions to or modifications of existing structures should not decrease the ability of the original structure to withstand any earthquake or other geologic hazards.

9. The public should be made aware of hazards and measures which can be taken to protect their lives and property.

10. Reports of geologic and/or soil investigations should be required in all instances in which a permit is sought and available information indicates a potential substantial threat to life or property from a geological hazard.

11. The location and extent of areas covered by soil and geologic investigations received by the town should be recorded on a town map, and the reports thereon should be considered to be public records. Where appropriate, the results of such detailed investigations will be utilized to supplement and supersede more general information.

Acceptable Risk (In Relation to Structures and Occupancies)

4107 This section: (a) defines the term "acceptable risk", and (b) assigns various structures, occupancies and land uses to risk classes.

Acceptable Risk

4108 The term "acceptable risk" is used to describe the level of risk that the majority of citizens will accept without asking for governmental action to provide protection. To illustrate this point, consider a site which is subject to occasional flooding. If the chances are one in a thousand that the site will be flooded in any given year, local citizens will probably accept that risk without asking for special protection. If the chances of flooding are one in ten, however, either governmental regulations would be enacted to keep people from building on the site (in order to protect life and property), or

property owners would ask that government build protection devices to control the flood waters.

Classification of Structures and Occupancies

4109 Five major classes of structures and occupancies are established in Table 1 for the purpose of risk rating. The first two classes include critical facilities and occupancies – those structures and occupancies which are especially important for the preservation of life, the protection of property or for the continuing functioning of society. Less critical structures and occupancies are included in Classes 3, 4 and 5. The table includes structures and occupancies not presently or likely to ever be in the Portola Valley planning area. They are included, however, to provide a context for the particular structures and occupancies relevant to the planning area. The fourth column in Table 1 describes the maximum amount of damage deemed acceptable in the event of a great earthquake similar to the 1906 earthquake or in the event of a major fire. The last column classifies the acceptable damage in terms of acceptable risk.

Potential Hazards in the Planning Area

4110 Each of the following potential hazards is briefly described in the following pages as it relates to the Portola Valley planning area:

1. Faulting
2. Ground Shaking
3. Landsliding
4. Ground Settlement
5. Soil Liquefaction
6. Flooding
7. Erosion and Sedimentation
8. Expansive Soils and Soil Creep
9. Fire Hazards

4111 Documents upon which these descriptions are largely based and which provide additional pertinent information are listed in Appendix 14. Also,

the most pertinent references for each type of hazard are listed by numbers in parentheses within and following each hazard summary.

4112 The descriptions of the hazards contained herein and in the sources cited in Appendix 14 provide the general basis for applying the policies set forth in this element. As new information becomes available which supplements or modifies these descriptions of hazards, such new information, when officially accepted by the town, may be used in applying or interpreting town policy.

Faulting

4113 Portola Valley is bisected by the San Andreas Fault Zone which is made up of a large number of individual fault traces along which movement has occurred at some time in the past. A few of the traces of the San Andreas Fault Zone are considered to be active; some are deemed to be inactive; and others are poorly defined or are as yet unrecognized, and the

Table 1. inserted this page

possibility of their activity is questionable. Experience in California and in other parts of the world where active faulting is taking place indicates that future fault movements are most likely to occur along the traces of recent displacements. Ground rupturing, with horizontal displacements of 8 to 10 feet, took place along several fault traces through Portola Valley in the 1906 earthquake. Measurable earth strain and other geologic considerations suggest that similar or greater amounts of displacement may be anticipated in the Portola Valley area in the years ahead. Recurrence intervals for major movements along the Portola Valley segment of the San Andreas Fault are calculated to be approximately 100 years.

4114 Although future fault movement is generally anticipated along only those faults judged to be active, there is always the possibility that movement may occur along traces deemed to be inactive, previously unrecognized, or newly formed. The most detailed information regarding the description and location of the most readily recognizable active fault traces in the Portola Valley area is contained in the report by W.R. Dickinson entitled "Commentary and Reconnaissance Photogeologic Map of San Andreas Rift Belt, Portola Valley, California" (1)* and accompanying map (2).

4115 The traces of the San Andreas Fault Zone judged to be active and with significant potential for future displacement are shown with distinctive heavy lines on the geologic map of the Town of Portola Valley (Scale 1" = 500') (3). Fault traces from this source are also shown on the Special Studies Zones Maps of the Mindego Hill and Palo Alto Quadrangles (Scale 1" = 2000') (4), issued by the California Division of Mines and Geology in compliance with requirements of the Alquist-Priolo Special Studies Zones Act.

4116 The hazard associated with active fault traces is clear. Any structure built across such a trace and subsequently offset by faulting would be in danger of collapse and constitute a threat of life. Studies of the San Andreas Fault in California and other similar faults elsewhere in the world show that dislocations associated with faulting tend to be concentrated along relatively narrow traces. A belt of disturbed ground several hundred feet wide or more, characterized by secondary fractures and cracks, ground lurching and warping may develop along traces of dislocation. Although deformation of this zone may result in serious structural damage to buildings within it, the risk of structural collapse due solely to permanent ground displacement is considerably less than for sites across or immediately adjacent to the

* All references referred to by number are listed in complete citation form in Appendix 1.

principal trace of movement. For further information, see also references (4a) (4b) (4c) (4d) (5) (6) (7) (8) (9) (10) and (11).

Ground Shaking

4117 Although sparsely populated, the Portola Valley area experienced considerable damage from ground shaking in the 1906 earthquake, which is estimated to have been of a Richter magnitude* 8.3, with local intensities ranging from VIII to X, on the Modified Mercalli scale** (1956 edition).

4118 Experts estimate that there is a "significant probability" that the San Andreas Fault will produce an earthquake of the magnitude of the 1906 earthquake sometime during the next 30 years (12); this could be in the Portola Valley area, or elsewhere along other sections of the fault.

4119 The characteristics of a "maximum probable" earthquake which might affect the Portola Valley planning area are described in Table 2. In estimating risk of loss from an earthquake, the occurrence of the maximum probable earthquake (8.3 Richter, XI Mercalli) should be the assumed basis for prudent planning.

Table 2. Maximum Probable Earthquake on the San Andreas Fault

Magnitude	8.3
Maximum*(a)* Acceleration (g)	0.5g (peak 1.0g)
Predominant*(a)* Period (Seconds)	0.2 to 0.45
Probable Duration*(b)* of Strongest Ground Shaking (Seconds)	35+(total duration 50 to 60)
Maximum Modified Mercalli Intensity	XI

(a) see Schnabel and Seed (13)
(b) see Seed (14)

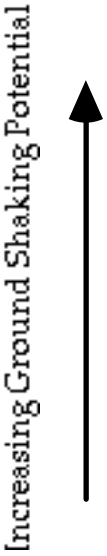
4120 Effects of ground shaking in Portola Valley would vary with different underlying rock formations, soil conditions, and the amount of underground water present. Those areas underlain by relatively thick, unconsolidated, water-soaked surficial sediments (such as some recent alluvial deposits) have a greater potential for damaging effects due to ground shaking than do

* Magnitude is an objective, instrumentally determined measure of the energy released by an earthquake at its source. The magnitude scale is logarithmic, hence an increase in one unit of magnitude (e.g. 6 to 7) represents a ten-fold increase in energy released at the source.

** See Appendix 14 for explanation of the Modified Mercalli Intensity Scale.

areas of firm bedrock. Table 3, below, defines three "geologic categories" in the Portola Valley planning area in which the geologic materials are grouped on the basis of their anticipated response to seismic shaking. Materials in Category A are considered likely to respond more actively to an earthquake than those in Category B, which in turn, would respond more actively than those in Category C.

Table 3. Relative Ground Shaking Potential in the Portola Valley Planning Area*



Geologic Category A	*Surficial Materials* – generally young, often saturated, unconsolidated alluvial deposits of gravel, sand, silt and clay commonly confined to valley floors; slope wash; landslide debris and artificial fill.
Geologic Category B	*Near-Bedrock Materials* – semi-consolidated to consolidated older alluvial deposits of gravel, sand, silt and clay (Santa Clara Formation)
Geologic Category C	*Bedrock Materials* – hard, stratified to massive, deposits of sandstone, shale, conglomerate, chert, mafic, igneous rocks and serpentine (generally shown as Stable Bedrock-Sbr-on Movement Potential Map of Portola Valley)

For further information, see references 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 and 17

Landsliding

4121 Landsliding is the mass-movement of soil and rock downslope along one or more recognizable slip surfaces; the movement may be rapid (as in rock-falls) or very slow (as in earth flows). In the California coast ranges, landsliding is a natural and widespread phenomenon occurring on many slopes underlain by relatively unstable rocks and soils. Initiation of movement of a new landslide or reactivation of an existing one may be caused by either natural processes or human activities. Strength of hillslope materials may be reduced by weathering and decay of rocks and soils,

* See Geologic and Movement Potential Maps of Town of Portola Valley for the location of areas underlain by materials described above, reference (3).

saturation and strong vibrations. The balance of forces acting on hillslopes, ordinarily in equilibrium, may be upset by addition of weight, removal of lateral support and seismic accelerations. Excavation, construction, irrigation and disposal of waste water in septic drainfields contribute to these processes. Strong ground motion during earthquakes may initiate new landslides and reactivate existing ones. Studies following larger earthquakes in California demonstrate that landsliding is commonly the most widespread type of earthquake related ground failure.

4122 The geologic map of Portola Valley shows the location of numerous landslides. Most notably, it indicates that more than half of the hillsides in the western portion of the Portola Valley planning area have been subject to landslide activity. Some of these landslides are ancient and naturally stabilized; some of them are recent and potentially hazardous; and some are actively moving. The hazard to public and private property as well as to public safety from landslides is clear. Roads and utility lines crossing an active landslide may be blocked or severed. Structures may be damaged or destroyed if encroached on or carried downslope by an actively moving landslide. For further information, see references (3) (7) (15) and (18).

Ground Settlement

4123 Ground settlement is the sinking of the surface of the land and is most commonly due to the compaction of unconsolidated granular sediments and soils. Compaction and settlement of such materials is a natural process that ordinarily takes place slowly and imperceptibly. However, the process can be accelerated by loading imperfectly compacted soils with embankments or buildings, by excessive withdrawal of ground water, or by ground shaking resulting from earthquakes. Seismically induced ground settlement or "shakedown" may occur very rapidly. Settlement, particularly when aggravated by human or seismic processes, may be unequally distributed over a small area (differential settlement) with damaging effects to foundations of structures resting directly on the settled ground. Ground settlement during earthquakes has been a major source of property damage in many earthquake-prone regions of the world.

4124 Areas within Portola Valley with the highest potential for ground settlement are those shown on the geologic map of the town as alluvium, slope wash, and landslide deposits. However, some areas underlain by other units may also be subject to ground settlement. Detailed site investigations are required to determine local settlement potential. For further information, see references (3) (5) and (15).

Soil Liquefaction

4125 Soil liquefaction is the phenomenon in which certain water-saturated soils temporarily lose their strength when subjected to intense shaking and flow as a fluid. Soils most susceptible to liquefaction are saturated, well-sorted, poorly-compacted, fine sands and silts. Substantial damage in California and other areas of the world has been caused by soil liquefaction brought about by earthquakes.

4126 Although sufficiently detailed geologic and engineering information to predict accurately sites of soil liquefaction in Portola Valley is not currently available, the possibility of liquefaction in localized areas along the valley floor, underlain by unconsolidated alluvium and a seasonally high water table, is considered to be relatively high.

Flooding

4127 In the past, Portola Valley has experienced minor flooding in areas adjacent to streams. These areas include portions of the natural floodplains of Corte Madera, Sausal and Los Trancos creeks, and locations where inadequate or obstructed drainage facilities have been unable to contain peak flows. Hydrologic principles suggest that similar minor flooding will recur sporadically and that somewhat more extensive flooding may take place during widely spaced intervals. The *Flood Insurance Study for Portola Valley* (20) prepared by the U.S. Soil Conservation Service in 1971 focuses attention on Corte Madera Creek and illustrates the potential for local to general overbank flooding for return periods between 10 and 500 years with floodplain water depths of up to 5 feet for the 100 year flood. Inundation by the 100 year flood is indicated for significant portions of the floodplain along Willowbrook Drive and between Westridge and the town boundary. The *Master Storm Drainage Report for Portola Valley* (1970) (21) cites a number of existing drainage facilities judged to be inadequate to pass 10 to 25 year flood flows or which are subject to obstruction by debris and which may contribute to local flooding conditions in their vicinity during periods of high runoff.

4128 In addition to the periodic recurrence of minor flooding due to intense rainfall, portions of Portola Valley are exposed to the hazard of flooding that may result from seismically induced failure of small dams. Boronda Lake in Palo Alto Foothills Park in the Los Trancos Creek drainage and the small reservoir behind The Sequoias and the Morshead Lake in the Sausal Creek drainage are retained by earthen embankments. Should either of these dams fail during an earthquake, some downstream flooding may be expected

although no data are available to assess accurately either the seismic stability of the dams or the potential flood hazard.

For further information, see references (7) and (22).

Erosion and Sedimentation

4129 Erosion and sedimentation are on-going natural processes in Portola Valley as they are elsewhere in the world. Factors influencing the rate of erosion at any particular location include climate, weather, rock and soil characteristics, slope and vegetation. Erosion occurs chiefly on steeper slopes in the upper reaches of drainage basins where runoff velocities are high. Sedimentation, on the other hand, takes place mainly in the lower reaches of drainages where stream gradients and velocities are reduced. No stream gauging or sediment load data are available for the streams in Portola Valley, but it is apparent that the highest erosion potential is found on the steep slopes descending from Skyline Boulevard to the valley floor. Moderately high erosion potential also exists along some short, steep drainages in the Westridge and Alpine Hills areas.

4130 The *Report and General Soil Map of San Mateo County* (23), revised in 1970 by the U.S. Soil Conservation Service, provides a generalized view of the distribution of principal soil associations in the Portola Valley area and the relative erodibility of the soil groups. It assigns a high erosion hazard to the soils on the steep slopes west of the valley floor and a moderate hazard to the foothill areas to the east.

4131 Although no detailed studies of erodibility of the various geologic units (and their associated soils) shown on the geologic map of the town have been made, some generalizations are possible. Other factors being equal, surficial deposits of alluvium and slope wash as well as landslide deposits can be expected to be most susceptible to erosion; the beds of the Santa Clara Formation of intermediate erodibility; and the older bedrock units of least, but variable, erosion potential.

4132 Throughout much of Portola Valley and the surrounding area, the combination of natural slopes, soil structure and native vegetation contribute to a relatively slow natural erosional rate. On the other hand, where natural conditions are disturbed by grading and site development or poorly controlled animal keeping, erosion can be greatly accelerated and cause damage both to the site where it occurs and downstream where sedimentation of the eroded debris takes place.

4133 With the exception of the flood plain of Corte Madera Creek along the Portola Valley-Woodside boundary west of Mapache Drive, few persistent areas of natural sedimentation exist in Portola Valley. Most of the sediment produced by erosion is exported by stream flow beyond the boundaries of the town. Local sedimentation does occur along the main creeks and tributary drainages chiefly where human activities have altered stream flow characteristics. Here, sediment accumulations have partially obstructed a number of culverts and drainage ditches, increasing the hazard of local flooding at these points.

For further information, see references (7) and (24).

Expansive Soils and Soil Creep

4134 Some soils and bedrock materials in the Portola Valley area swell when they become wet and shrink when they dry as a result of water absorption by certain expansible clay minerals they contain. Building foundations bearing on such materials may suffer destructive distortions if not properly engineered.

4135 Expansive soils may be encountered anywhere within the Portola Valley area, but they occur most frequently in areas shown on the town's Movement Potential of Undisturbed Ground Map as expansive soils and bedrock. Individual site investigations and laboratory testing are required to identify expansive soil conditions.

4136 Repeated expansion and contraction of soils on slopes results in slow creep of the soil layer in a downslope direction. The expansion and contraction may be caused merely by bulk adsorption and loss of water or freezing and thawing, but soils containing truly expansible clays are subject to pronounced soil creep. Soil creep may exert large enough lateral forces on building foundations to produce significant distortions of the structure or damage to the foundation if unanticipated in the foundation design. For further information, see references (3), (7), and (23).

Fire Hazards

4137 The Portola Valley planning area is served by the Woodside Fire Protection District, the California State Division of Forestry, and Stanford University. Northern and eastern portions of the planning area are also served by the Menlo Park Fire Protection District and the Palo Alto Fire Department. All of these fire protection services fight both structural and non-structural fires, although the equipment operated by the California State Division of Forestry

is designed to be most effective against grass, brush and forest fires, rather than structural fires.

4138 A Fire Hazards Map, on which are designated areas subject to significant fire hazards, has been prepared by the Woodside Fire Protection District for the Portola Valley planning area portion of the district. This map can be found in a pocket following this general plan. The boundaries are approximate because: 1) they are based on general information and 2) hazards usually increase or diminish gradually rather than abruptly as shown by the lines on the map.

4139 The map indicates that except for a few isolated small areas in the developed portion of the town, the significant fire hazard area is that which lies south and west of Portola Road and south and east of Alpine Road. This includes primarily all of the undeveloped portion of the town. To varying degrees these area are considered hazardous based on the following four basic fire safety factors:

1. Water Supply. The basic criterion for judging the adequacy of water supply for fire fighting purposes is 1,000 gallons per minute for a period of 2 hours, with a residual pressure of 20-lbs/sq. in.

2. Accessibility. The factor of "accessibility" is measured in terms of travel time from a fire station to a potential fire location. It is a measure of the time that a fire-fighting crew will need to get to the fire and start extinguishing it.

3. Land Slope. Land slope influences fire safety in two ways. First, fire tends to spread up steep slopes far faster than it does on level land. Secondly, the slope of the land determines how easy it is to move firefighters and equipment to the scene of the fire.

4. Flammability and Fuel Loading. The term "flammability" is an index of how easily material is ignited, while "fuel loading" is an index of how much material is present to burn. Dry grass, for example, is very flammable but has a very light fuel loading and would burn out quickly. On the other hand, a pile of firewood may be very hard to ignite, but once lit, would burn for a long time. The two factors are considered as a single rating factor in this study.

4140 The following portions of the planning area are not shown on the Fire Hazards Map: the open lands of Stanford University in the northerly part of the planning area including Jasper Ridge Biological Preserve, SLAC, Webb Ranch and the Academic Reserve; the unincorporated area southeast of the

town; and the sparsely developed portions of Santa Clara County including the Palo Alto Foothill Park which occupy the easterly fringe of the planning area. An analysis employing the basic fire hazard factors previously described likely would reveal portions of these areas would be subject to significant fire hazards. When data is available from the responsible fire protection agencies, such data should be referenced herein.

4141 The conclusions drawn from the analysis of fire hazards in Portola Valley are:

1. The relatively level sections of the Portola Valley planning area which have been developed with roads and have good water supply systems are relatively well protected from fire hazards. These areas can be reached quickly by fire fighting equipment, and firefighters area normally able to subdue fires in these areas quite rapidly. These lands include those which are not otherwise ascribed hazard designations on the fire hazards map.

2. The sections of the Portola Valley planning area which are in steep hillside terrain, have few roads and are lacking in water supply are relatively hazardous when judged from a fire safety point of view. These areas cannot be reached quickly by fire fighters, and when they are reached, fire fighters may have substantial difficulty in fighting the fire because of difficulty of movement, dependence on hand carried equipment, and lack of water. These lands are clearly the most hazardous in the planning area. For further information, see reference (25).

Policies

4142 The following policies are intended to guide the town and private parties in future actions.

4143 1. ***Policies Concerning Fault Displacement Hazards***

a. Consider all faults shown on the map "Fault Lines Mapped by W.R. Dickenson, November 1971" (2) and "Special Studies Zones Maps" (4), as each may be amended, as active faults, unless and until evidence to the contrary is developed through field investigations.

b. Locate structures for human occupancy appropriate distances from fault traces shown on the map "Fault Lines Mapped by W.R. Dickenson, November 1971" (2), as may be amended. Specify in town regulations appropriate distances from each type of fault trace and establish procedures for bringing about compliance with this policy.

c. Subdivisions, structures or other developments within the special studies zones shown on the maps "Special Studies Zones Maps" (4) should at a minimum comply with pertinent state regulations.

d. Design and construct new roads, bridges and utility lines (either public or private) that cross active fault traces in a manner which recognizes the hazard of fault movement. Such designs should consider that there is a possibility of a 20 foot right-lateral displacement on the Woodside and Trancos traces of the San Andreas Fault. Equip water, gas, and electric lines that cross active fault traces with shut-off devices which utilize the best available technology for quick shut-off consistent with providing reliable service.

e. Examine all existing utility lines that cross active fault traces to determine their ability to survive fault movement (in the amount described in paragraph d. above). Utility companies should institute orderly programs of installing shut-off devices on these lines, starting with the lines that cross the Woodside and Trancos traces and those which serve the most people. Consider above-ground crossing of fault traces where continued service and safety cannot be assured for subsurface lines. Establish and maintain adequate emergency water supplies in areas served by water lines which cross active fault traces.

f. Consider fault traces such as those of the Pilarcitos Fault, the unnamed fault that trends past Searsville Lake along Bear Creek (26), and others shown on the Geologic Map of the Town as inactive in the review of applications for the construction of buildings for human occupancy, site development, land divisions and subdivisions. Appropriate geological investigations should be made and reviewed to determine the fault location and characteristics prior to the approval of any such applications.

4144 2. Policies Concerning Ground Shaking Hazards

a. Design and construct critical facilities in the Portola Valley planning area to withstand the "maximum probable" earthquake and remain in service.

b. Review the structural integrity of all existing critical facilities in the town and strengthen, remove or replace those which are found to be unable to meet policy a. above.

c. Design and construct structures for human occupancy to retain their structural integrity when subjected to the anticipated shaking from a "maximum probable" earthquake. Place emphasis on seismic design and seismic bracing systems. Where deemed appropriate by the town, designs shall be reviewed by a structural engineer.

d. The Town of Portola Valley endorses the review and updating of the Uniform Building Code (which the town has adopted by reference), with the objective of adding to it revisions which reflect information gained from recent earthquakes.

3. Policies Concerning Landslide Hazards

a. Review all proposed developments with respect to the "Geologic Map" and "Movement Potential of Undisturbed Ground" map (3) of the town. Require geologic and soil reports for all significant development of all areas shown as landslides. Reports should be responsive to the information indicated on these maps.

b. Locate structures for human habitation and most public utilities so as not to risk other than minimum disturbances from potential landslides. Give due consideration to mitigating measures, based on geologic and other reports acceptable to the town, which can be taken to reduce the risk from seismic and non-seismic hazards to an acceptable level (as defined in Table 1 and related text).

c. Where roads or utility lines are proposed to cross landslide areas for reasons of convenience or necessity, they should be permitted only if special design and construction techniques can be employed to assure that acceptable risk levels will be met.

d. Adopt implementing policies and/or regulations which are consistent with Policies a. through e. above and which will help assure that any failures of ground due to landslides will not endanger public or private property beyond levels of acceptable risk defined in this element.

4146 4. Policy Concerning Ground Settlement

a. Consider those areas shown on the "Geologic Map" (3) as alluvium, slope wash or landslide deposits to be areas of potential ground settlement and require detailed site investigation of this potential. Address potential for settlement in other locations in routine site investigations.

4147 5. Policy Concerning Soil Liquefaction

a. Consider the possibility of soil liquefaction in site investigations in connection with applications for development, especially in areas along the valley floor underlain by unconsolidated alluvium and a seasonally high water table.

4148 6. Policies Concerning Flood Hazards

a. Review all applications for subdivisions, building permits and other similar approvals in the vicinity of major drainage channels with respect to potential flooding.

b. Do not erect structures in areas determined to be subject to "100 year floods" unless appropriate measures will mitigate potential adverse effects on the structures and nearby properties. Minor structures where there is no threat to life and little threat to property may be excepted.

c. Rely upon maps accompanying the *Flood Insurance Study, Portola Valley* (20), until superseded by more accurate maps, to define the "100 year flood" area along the relevant portion of Corte Madera Creek unless professionally prepared hydrological reports indicate that the subject site is not within an area which is subjected to "100 year floods."

d. Replace or improve existing drainage structures such as culverts and pipes deemed to be inadequate to meet acceptable standards.

e. Do not erect structures which will impede the flow of flood waters in a flood channel.

f. Encourage owners of buildings which are in flood-prone areas to take appropriate measures to reduce the likelihood of flood damage to their property. Control any such measures so as to not increase the flood or erosion hazards to other properties.

g. Maintain appropriate vegetation on the terrain in the Portola Valley planning area to minimize runoff of rainfall, consistent with other safety practices.

h. The town intends to continue to participate in the National Flood Insurance Program and recommends that the Federal Insurance Administration expedite completion of maps which will indicate the areas in Portola Valley which are subject to "100 year floods."

i. When more accurate maps are available indicating areas within the town which are subject to "100 year floods" the town should amend its codes and ordinances so as to prohibit construction which would be hazardous to life or property in these areas, or would adversely affect the flow of storm waters.

j. When the state required flood inundation map for Searsville Dam is available, it should be used in reviewing land uses proposed in the general plan for affected downstream areas.

4149 7. Policy Concerning Erosion and Sedimentation

a. Maintain natural slopes and preserve existing vegetation, especially in hillside areas. When change in natural grade or removal of existing vegetation is required, employ remedial measures to restore or provide appropriate vegetative cover and to control storm water runoff. Give special attention to minimizing erosion problems resulting from the keeping of animals. In specific application these policies will be tempered by needs for fire safety.

The town currently administers the provisions of the subdivision ordinance concerning landscaping and erosion control and the provisions of the site development ordinance concerning grading, giving special attention to the protective measures which are appropriate prior to the advent of seasonal rains.

4150 8. Policy Concerning Expansive Soils and Soil Creep

a. In areas where information available to town officials indicates the probability of expansive soils or soil creep, soils reports should be submitted in connection with all applications for development. In those instances in which expansive or creep soils are reported, measures as are necessary to mitigate the probable effects of this hazard will be required.

4151 9. Policies Concerning Fire Hazards

a. Do not construct buildings for human occupancy, critical facilities and high value structures in areas classified as having a high fire risk, unless it is demonstrated that mitigating measures will be taken which will reduce the fire risk to an acceptable level.

b. Prior to the approval of any subdivision of lands in an area of high fire risk, the planning commission should review the results of a study which includes at least the following topics:

1) the costs and means of providing fire protection to the subdivision, and

2) an indication of who pays for the costs involved, and who receives the benefits.

c. Provide adequate clearance around structures to prevent spread of fire by direct exposure to assure adequate access in times of emergency and for the suppression of fire.

d. In locations identified as presenting high fire hazard, require special protective measures to control spread of fire and provide safety to occupants, including but not limited to types of construction and use of appropriate materials.

e. When reasonable and needed, make privately owned sources of water, such as swimming pools, in or adjacent to high fire risk areas, accessible to fire trucks for use for on-site fire protection.

f. Establish street naming and numbering systems to avoid potential confusion for emergency response vehicles.

g. Design and permit all private roads for unrestricted access to all Woodside Fire Protection District equipment.

Emergency Preparedness

4152 Effective response to emergencies requires that, in advance of need, emergency services be organized and necessary physical facilities be provided. Areas of concern include:

1. Fire fighting and rescue

2. Law enforcement

3. Medical services
    a. trained personnel: first aid, nurses, doctors
    b. ambulance service
    c. availability of hospitals
    d. stockpiling of medical supplies
4. Availability of emergency shelter
5. Provision of emergency food supplies
6. Communications networks
    a. emergency services
    b. citizen information
7. Public utilities
8. Transportation facilities
9. Evacuation routes to undamaged areas

4153 The town program for emergency and disaster response should continue to give specific consideration to both the general nature of hazard exposure in the planning area and specific steps that can be taken in advance of natural disaster to facilitate emergency response.

4154 Emergency response measures for the Town of Portola Valley are set forth in the Portola Valley Emergency Preparedness Program (27) (a cooperative program with the San Mateo County Office of Emergency Preparedness, with support from the State of California Office of Emergency Preparedness).

4155 Emergency preparedness planning for the Portola Valley area is based on the premise that local emergencies will be dealt with quickly and effectively by local forces, such as local fire protection services, the County Sheriff, and local health services. The assumption is also made that any major disaster or emergency will require outside assistance, from nearby cities, the county, the state, or from federal sources.

4156 Portola Valley is aware that if an emergency situation affects a wide geographical area (as an earthquake might), that the densely populated areas will probably receive aid first, and that rural areas such as Portola Valley will

receive lower priority attention. For this reason, residents of the Portola Valley area need to keep an adequate supply of food, water and medical supplies available, sufficient to sustain them for considerable time after a disaster.

4157 Policies Concerning Emergency Preparedness

1. Interstate 280 and the arterial roads shown in the circulation element of this general plan are established as "evacuation routes" that will be utilized in the event of emergency.

2. The town recognizes the need to have roads of adequate capacity for use in times of emergency. The town has adopted specific standards for road design, including standards for road width, grade and alignment that it finds to be appropriate for the movement of emergency equipment.

3. The town recognizes the necessity of having emergency evacuation routes unimpeded by structures near the traveled way, by narrow bridges, by low overhead signs or by trees that would block the passage of vehicles in time of emergencies. It is therefore town policy to maintain emergency evacuation routes (described in paragraph 1 above) in usable condition. The town has adopted zoning regulations and a building code which set forth minimum distances around and between structures.

4. Design and construct subdivisions and other developments in the Portola Valley planning area in such a manner that levels of "acceptable risk" are not exceeded and that built-in "mitigating measures" are taken. This includes the provision of adequate water supplies, roads which are suitable for the safe passage of emergency vehicles and adequate street-name signs.

5. The Town of Portola Valley supports a program to identify existing hazards and reduce the risk from them. Risk reduction includes measures to improve water supplies, to provide emergency "escape routes" in areas of high risk, to provide legible road signs and other appropriate measures.

6. The Town of Portola Valley supports measures to increase the ability of local fire, police and health forces to deal with emergencies as they arise, within affordable economic cost.

7. The Town of Portola Valley will continue its cooperation with county, state and federal agencies in emergency preparedness measures and in mutual assistance programs.

8. The Town of Portola Valley recommends that residents of the Portola Valley planning area keep on hand supplies of food, water, and medical supplies that will be sufficient for their needs for several days in the event of disaster.

9. The town endorses, and will continue to participate in, public information programs which will assist local residents in coping with local emergencies that arise from time to time (such as the need for fire protection, or emergency health services), as well as being prepared for possible major disasters.

10. The town recognizes the necessity of having an adequate water supply for fire fighting purposes. It is town policy that lands within the Portola Valley planning area be provided with an adequate water supply as they are developed. More specific standards for water flow, water pressure and water availability for fire fighting are set forth in town regulations.

General Policies for Implementation

4158 The preceding pages contain recommendations for avoiding or mitigating the hazards that have been identified. Many of the measures that might be taken to mitigate the hazards cited in this element could produce results in conflict with other elements of the general plan. Just because natural hazards can be mitigated does not mean that in all cases they should be, especially if such action would produce results which are in conflict with the conservation element, the land use element, the open space element, or other sections of the general plan.

4159 For example, take a tract of land in the hillside areas of Portola Valley that is afflicted with several small landslides and is in an area with very poor fire protection. Merely because the hazards of landslide and fire can be reduced to an acceptably low level of risk does not mean that the town should approve the building of a subdivision there. Before any decision is made on the matter, the town should consider carefully the costs and the benefits of such hillside development, both immediate and long range, and then judge whether or not the public interest would be best served by the approval of the proposed land development.