

V

SAFETY ELEMENT



## V. SAFETY ELEMENT

	<u>Page</u>
A. Authority and Purpose	V-1
B. Existing Conditions and Issues	V-2
1. Existing Conditions	V-2
a. Fire Hazards	V-2
b. Flooding	V-3
c. Seismic and Geological Hazards	V-5
1. Groundshaking	V-5
2. Liquefaction	V-6
3. Tsunamis	V-6
4. Landslides	V-6
d. Erosion	V-10
e. Coastal Erosion	V-10
f. Radiation	V-10
2. Issues	V-10
a. Fire Hazards	V-11
1. Wildlife Fire Hazards	V-11
2. Urban Fire Hazards	V-11
b. Flood Hazards	V-11
c. Seismic and Geologic Hazards	V-12
1. Major Faults	V-13
2. Groundshaking	V-14
3. Liquefaction	V-14
4. Tsunami	V-14
5. Landslides	V-14
d. Erosion	V-16
e. Coastal Erosion	V-16
f. Radiation Hazards	V-17
g. Emergency Preparedness	V-18
h. Acceptability of Risk	V-18
 Risk Criteria Associated with Seismic/Geologic Hazards	 V-23
i. Potential Method for Reducing Hazards	V-23
1. Fire Hazard Mitigations	V-23
2. Flood Hazard Mitigations	V-24
3. Earthquake Mitigation	V-24
4. Landslide Mitigation	V-25
5. Erosion Mitigation	V-25
6. Coastal Erosion Mitigation	V-25
7. Radiation Hazard Mitigation	V-25
 C. Objectives, Policies and Programs	 V-26

Safety Element  
Table of Contents

FIGURES

<u>Figure</u>		<u>Page</u>
S-1	100 Year Flood Plain	V-4
S-2	Ground Shaking Areas	V-7
S-3	Liquefaction Potential	V-8
S-4	Landslide Risk	V-9

TABLES

<u>Table</u>		
S-1	Taxonomy of Critical Facilities	V-21
S-2	Summary of Risk Criteria	V-22

## V-1 SAFETY ELEMENT

### A. AUTHORITY AND PURPOSE

The Safety Element addresses measures to protect, where feasible, citizens, visitors and structures of Morro Bay from major hazards such as earthquakes, floods and fires. In the past, these hazards were divided between two elements of the General Plan, the Seismic Safety Element which addressed earthquakes and the Safety Element which addressed other hazards. In 1984, the State Government Code was changed to allow the combination of these two elements into one document to be known as the Safety Element. (New)

Section 65302 (g) of the Government Code provides that a Safety Element shall be prepared:

for the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure; slope instability leading to mudslides and landslides, subsidence and other geologic hazards known to the legislative body; flooding; and wildland and urban fires. The safety element shall include mapping of known seismic and other geologic hazards. It shall also address evacuation routes, peakload water supply requirements, and minimum road widths and clearances around structures, as those items relate to identified fire and geologic hazards.

To the extent that a county's safety element is sufficiently detailed and contains appropriate policies and programs for adoption by a city, a city may adopt that portion of the county's safety element that pertains to the city's planning area in satisfaction of the requirement imposed by this subdivision.

Each county and city shall submit to the Division of Mines and Geology of the Department of Conservation one copy of the safety element and any technical studies used for developing the safety element. (New)

This Safety Element combines the provisions contained in the City's former Safety and Seismic Safety Elements as well as the Hazards section of the Local Coastal Plan. It also suggests areas that should be studied in the next update of this section of the General Plan. To meet this objective, this Safety Element includes technical analyses of different hazards in Morro Bay and policy recommendations to facilitate loss reduction from those hazards if they are realized. Specifically, the Element is concerned with the following potential hazards: wildland fire,

urban fire, natural flooding, dam inundation, geologic hazards (including summary seismic hazards), and radiation hazards. The Safety Element is also concerned with the emergency response capabilities of the various disaster service agencies in the City of Morro Bay and the County of San Luis Obispo. (S modified 1.1)

The Safety Element is intended to establish uniformity of policy and direction to minimize the risk from the hazards discussed in the Element. The heart of the Element is contained in the recommended goals, policies, safety criteria, and implementation strategies. Such information should be used in conjunction with other established policies contained in the General Plan. (S modified 1.1)

This Regional Safety Element has been prepared in two volumes for the Area Planning Council. The first volume is concerned with alternative planning actions for reducing risk. Volume II contains the risk analyses of potential hazards existing in the City, and provides estimates of the magnitude of various hazardous events which can be expected. (S modified)

It should be noted that the recommended policies contained in this document rely on the technical estimates of hazard magnitude, recurrence, and location contained in the original 1976 Safety and Seismic Safety Elements. These estimates are derived from sciences, such as seismology and fire ecology, which are relatively young, and in which much remains to be learned. The premise underlying the planning recommendations made in this volume is that we should incorporate hazards analysis into the planning process based on what we know today, rather than waiting until we know all that we would like to know. (S modified 1.1)

Throughout this report, reference is often made to the figures, tables, and maps presented in the Volume II Technical Report. It is therefore advisable to have a copy of the Technical Report on hand while reading this Safety Element. (S modified 1.2)

## B. EXISTING CONDITIONS AND ISSUES

### 1. Existing Conditions

a. Fire Hazards: Fires in undeveloped areas that result from the ignition of accumulated brush and woody material are termed "wildland fires" in this report. Wildland fires are treated separately in the Technical Report from "urban fires" which occur in the built-up areas of the City and primarily involve structures. Automobile fires and small to medium-sized brush fires within the City are also included in the urban fire category. These two categories of fire hazard are the types considered in this report. (S modified 1.3)

The dry vegetation throughout much of the year that exists in the hills east of Morro Bay, together with the dry climate and topography of this area, greatly enhances the potential of major brush fire. (LCP) The urbanized portions of Morro Bay are composed of a variety of structure types, some of which have flammable roofs and siding and are located in close proximity to fire-prone open lands. There is little separation between many buildings which increases the potential for a fire spreading. (New) Based on these and other factors, the community was rated by the Insurance Service Office on a scale of 1 to 10 (with 1 being the lowest risk) for their fire hazard. These ratings are then reflected in the Fire Insurance premiums which homeowners pay. For the urbanized portions of the City, the rating is a Class 5 (median) and the rural section go as low as Class 9 (high risk). (LCP 179)

The Navy jet fuel storage located in north Morro Bay poses another potential source of fire (and explosion) hazard. This facility occupies approximately 12 acres in the northern portion of the community. The facility is surrounded by residential development and undeveloped hills. At this time, the Navy does not anticipate expansion of this facility nor phasing out the operation.

Aviation fuel is brought to the facility by ocean tankers and is temporarily stored then transferred to air bases in the Central Valley. Currently, all receiving and shipping of fuel is through underground pipelines. A real potential problem may arise if the volume of fuel through the pipelines cannot be adequately transferred without the use of truck tankers. The impact of increased truck traffic in the area would become a hazard due to the narrow system of streets, exposing lives to increased potential of fuel spills and having trucks impact State Highway One without adequate traffic control in the form of signals. Policies addressing this facility are found in the Land Use Element and the Circulation Element. (LCP modified 180)

b. Flooding: Flood hazards in the City are also considered in two categories: natural flooding and dam inundation. "Natural flooding" hazards are those associated with major atmospheric events that result in the inundation of developed areas due to overflows of nearby stream courses or inadequacies in local storm drain facilities. Dam inundation hazards are those associated with the downstream inundation that would occur given a major structural failure in a nearby water impoundment. (S modified 1.3)

The City experienced major floods in 1969 and 1973. Flooding problems caused by these storms could have been worse if the Morro Bay flood plain had been developed with homesites or other urban uses. (LCP modified 168)

# FIGURE S-1

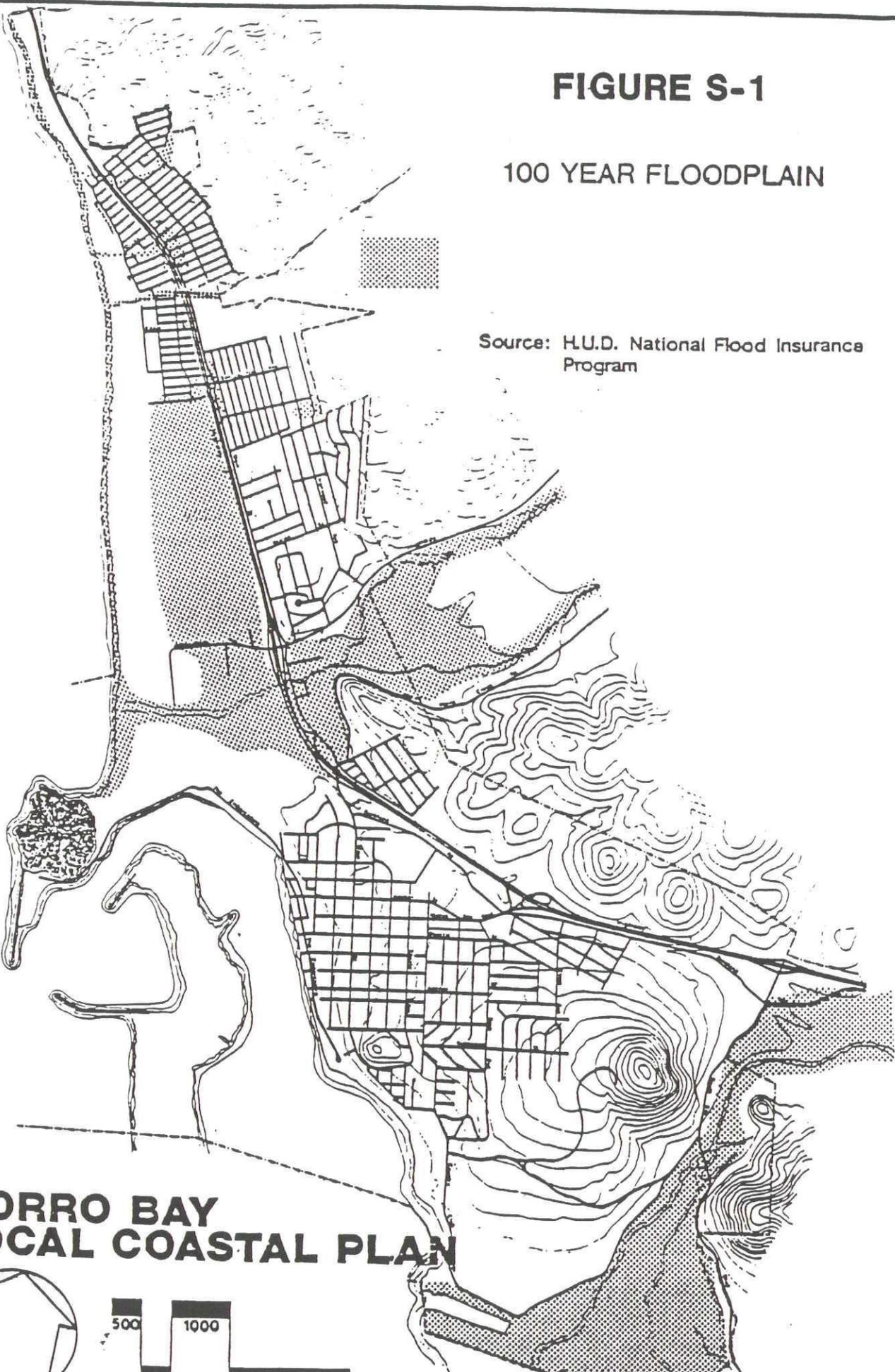
## 100 YEAR FLOODPLAIN

Source: H.U.D. National Flood Insurance Program

### MORRO BAY LOCAL COASTAL PLAN



500 1000



The greatest damage occurred during the storms of early 1969. Although storm waters were generally contained by those portions of Morro Creek that lie within the City, there was significant damage to telephone, power and gas lines, water wells and bridges. Though the majority of overland flood flow occurred in the low lying agricultural areas of the Morro and Chorro Valleys, there was severe damage to property within the City. (LCP 168)

Some of the major reasons for flooding was due to the pile up of debris on bridge piers, behind culverts, constricted channels, and utility crossings and the failure of earthen dikes to contain the storm waters. (LCP 168)

The storm of January, 1973, considered a storm of only a 20-year magnitude, brought flooding to the critical Highway One underpass where Highway 41 meets Main Street, and a number of areas in north Morro Bay east of Highway One. Flooding resulted due to backwater from culverts that were unable to handle the storm. (LCP 169)

Following the flooding that occurred in those years, Morro Bay applied for HUD's Federal Flood Insurance program which prompted the preparation of flood prone area maps and City passage of a model ordinance governing development in flood prone areas. Figure S-1 indicates the areas determined by the Army Corp of Engineers to be potentially subject to flooding in a 100-year storm. (LCP modified 169)

C. Seismic and Geologic Hazards: While the City of Morro Bay is in a seismically active area, there are no known active faults within or adjacent to the community. Nonetheless, potential threats to life and property from earthquakes are groundshaking, liquefaction, and tsunamis. (LCP 171)

Earthquakes originate as shock waves generated by movement along an active fault. The primary seismic hazards are ground shaking and the potential for ground rupture along the surface trace of the fault. Secondary seismic hazards result from the interaction of ground shaking with existing soil and bedrock conditions, and include liquefaction, settlement, landslides, tsunamis or "tidal waves", and seiches (oscillating waves in lakes or reservoirs). (S 1.3)

1. Groundshaking: Though not located close to the state's largest fault, the City may expect strong groundshaking from an earthquake on the San Andreas Fault Zone. This fault, located at its closest 41 miles from the City, is expected to generate an earthquake of 8.0 to 8.5 in the near future.

The level of groundshaking is based on the distance from the earthquake and the geologic strata underlying the

City. As shown in Figure S-2, those portions of the community underlaid by dune sand or alluvium may expect the greatest amount of shaking. The amount of groundshaking in other portions of the community underlaid by landslide deposits and active sand dunes may vary greatly.

Other faults, both on and offshore, can also cause groundshaking in the community but these are not expected to be as severe as that generated by the San Andreas Fault. (LCP modified 171)

2. Liquefaction: This condition results when a coarse-grained, saturated soil loses its structure due to groundshaking. The result is a fluid material, not unlike quicksand. Areas in the community potentially subject to high liquefaction risk are those underlaid by bay muds, landslide deposits and recent alluvium as shown in Figure S-3. (LCP 171)

3. Tsunamis: Seismic tidal waves or tsunamis, can be triggered by earthquakes or undersea landslides. These may be local with the tsunami striking shore within minutes after the quake or be thousands of miles away and taking hours to reach the coast. (LCP 171)

One of the earliest tsunamis on record occurred in 1878. The wave ran so high as to break over the sand spit which divides the bay from the ocean. Damage at Morro Bay is unknown, although a wharf at Point Sal was heavily damaged and Cayucos Wharf was reported to be slightly damaged. An earlier "tidal" wave apparently occurred in 1868. Damage to Morro Bay is unknown, but that wave was reported to have been disastrous to life and property along the western coast of America from the Columbia River to the Straits of Magellan. (New)

Morro Bay has suffered from tsunami damage in recent years, once in 1960 and then again in 1964. Triggered by an earthquake off the coast of Chili, the 1960 tsunami caused minor damage to a pier in the Morro Bay harbor. The 1964 tsunami resulted from an earthquake off Alaska and caused over \$2,500 damage in the harbor to wharfs, piers and buoys. (LCP 171)

4. Landslides: Abutting the City on three sides are steep hillsides. Development on these hillsides will alter the natural slope and topography often leading to landslides and erosion. Landslides are the downslope movement of rock and soil which may occur in a few minutes or through many years. Erosion refers to the breakdown and the washing away of surface material, usually soil. (LCP 175)

# FIGURE S-2

## GROUND SHAKING AREAS

 Areas of Potential Groundshaking

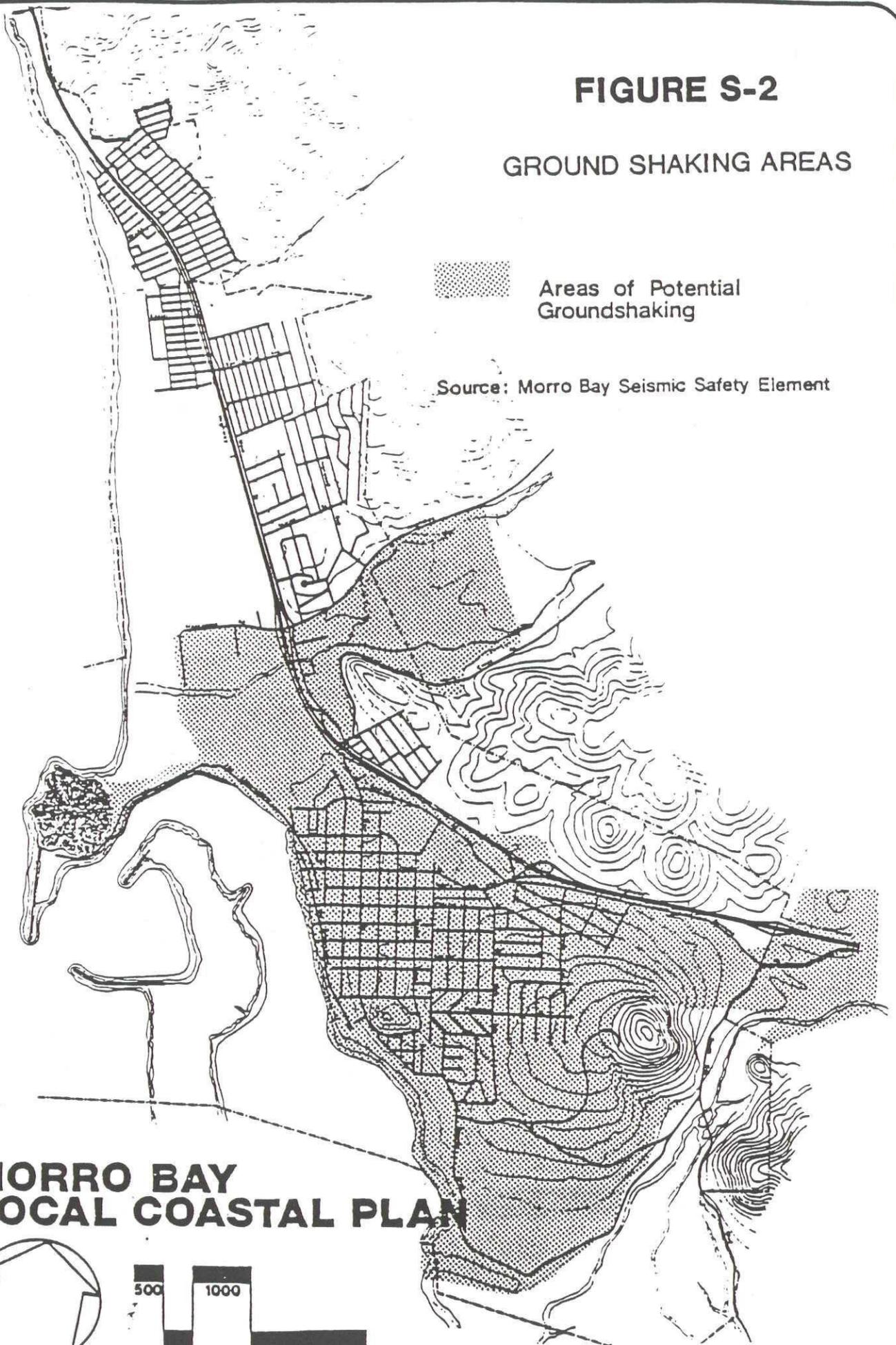
Source: Morro Bay Seismic Safety Element

### MORRO BAY LOCAL COASTAL PLAN



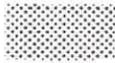
500

1000



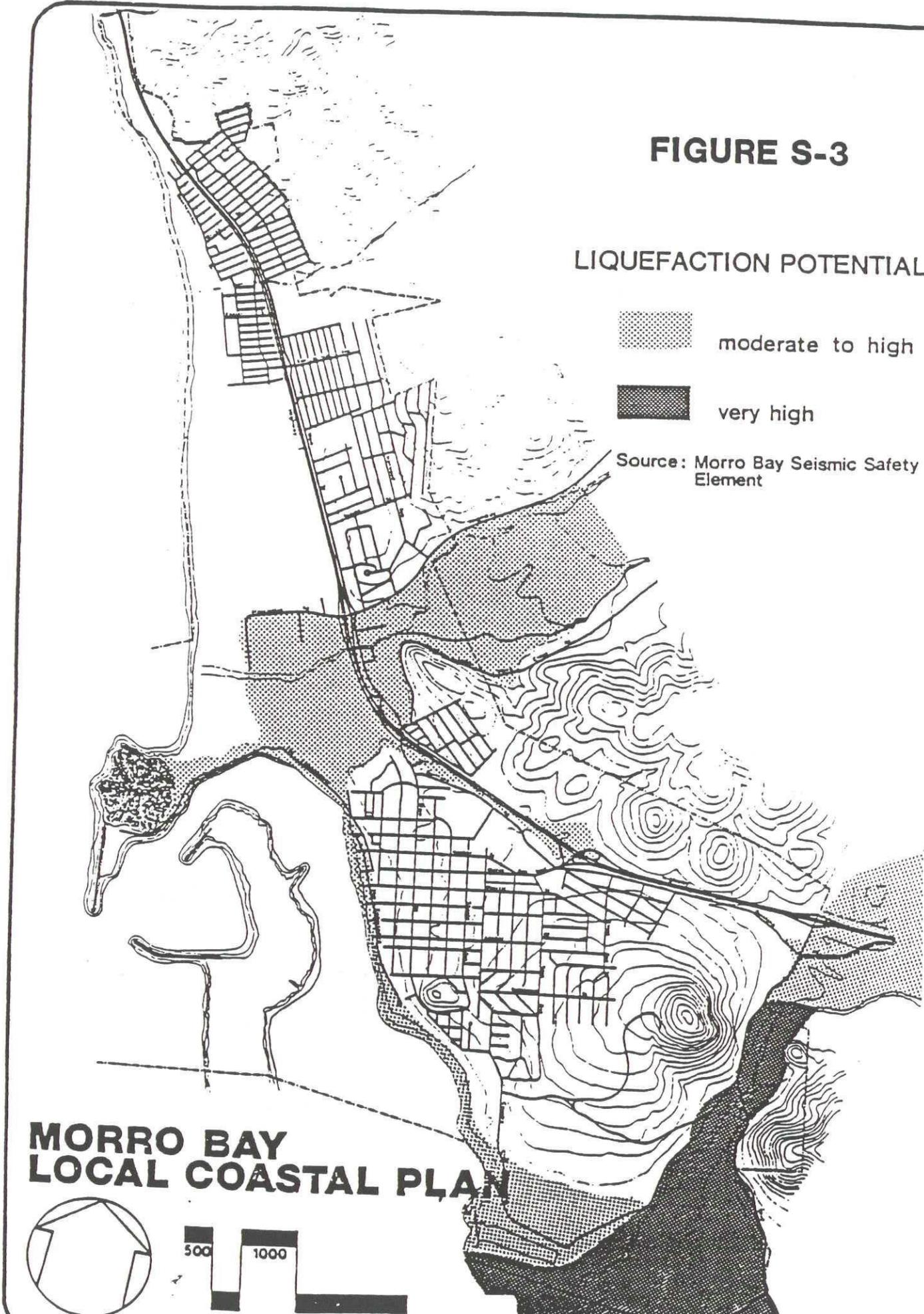
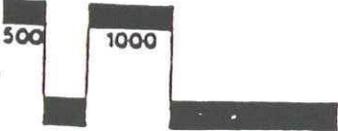
**FIGURE S-3**

**LIQUEFACTION POTENTIAL**

-  moderate to high
-  very high

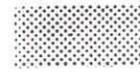
Source: Morro Bay Seismic Safety Element

**MORRO BAY  
LOCAL COASTAL PLAN**



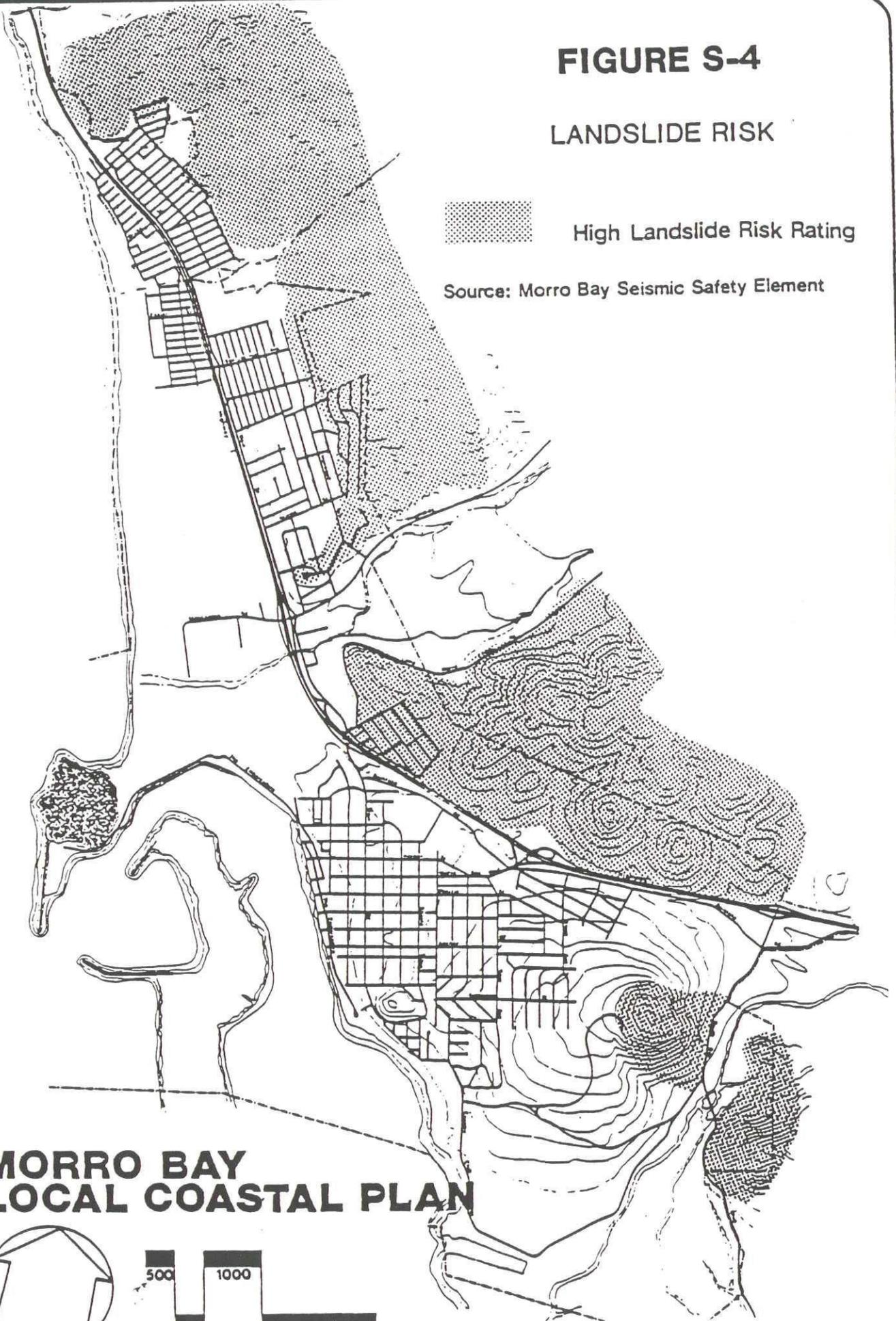
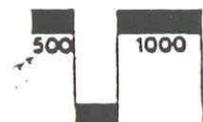
# FIGURE S-4

## LANDSLIDE RISK

 High Landslide Risk Rating

Source: Morro Bay Seismic Safety Element

### MORRO BAY LOCAL COASTAL PLAN



Due to the structural weakness of the underlying rocks, the hills to the east and north of the community have been subject to naturally caused slides throughout the ages (see Figure \*\*). While most of these slides are stable in their present condition, new development could reactivate them. This often results from grading practices accompanying development that steepen the slope angle or increase the slope height. (LCP 175)

d. Erosion: Disturbance of hillsides from development may also alter natural drainage patterns and vegetative cover, thus increasing runoff and the erosion that results. Development also brings an increase in impermeable surfaces-- such as roofs and driveways that also increase runoff. This runoff then contributes to downstream flooding and is lost for groundwater basin recharge. It also carries sediment and other pollutants into coastal streams and estuaries. Erosion within Morro Bay, Los Osos and surrounding agricultural areas has probably contributed to the sedimentation of the estuary and harbor. (LCP modified)

e. Coastal Erosion: The City experiences seasonal fluctuations in beach erosion. Usually, beach sands lost during winter storms are replenished by wave and tidal actions. Sands which are displaced by storms enter the harbor and create a need for periodic dredging to maintain a usable channel. No other major coastal erosion occurs in Morro Bay. (New 178-79)

f. Radiation: The City is located approximately 10 miles from the Diablo Canyon Nuclear Power Plant. In the event of an accidental release of radiation from the power plant, the City could be exposed to harmful amounts of radiation. An evacuation would be one of several options available to the City assuming that an evacuation were feasible.

The Emergency Response Plan adopted by the various jurisdictions within San Luis Obispo County provides some measure of protection for the residents and visitors of Morro Bay in the event of a major accident at the nuclear power plant.

## 2. ISSUES

The foundation of the Safety Element is the technical evaluation of fire, flooding, and geologic hazards. In addition, the background analysis of radiation hazards and emergency response capability form part of the basis of the recommended policies contained in this report. Major conclusions from the different technical analyses are as follows:

a. Fire Hazards:

1. Wildland Fire Hazards: Fires in wildland areas can destroy both vegetation and wildlife as well as threaten urban areas located on the fringe of the wildland areas.  
(New)

Fires in wildland areas can also have serious impacts on downstream development and water supplies. When vegetation is burned off, erosion becomes a critical problem, especially during the rainy season. Consequently, mudslides and landslides could threaten downhill development. (LCP modified 179)

It is also important that fires be prevented in hillside areas since the foothills are of major importance in protecting the watershed. The vegetation in these areas slow down overland flow which reduces erosion and allows greater groundwater recharge. Otherwise, the water is lost as runoff to the ocean and may greatly contribute to erosion, sedimentation and flooding downstream.

Wildland fires have not historically been a serious problem in the Morro Bay region due to a relatively low use of the hillside areas. Nevertheless, proper management of watershed areas is necessary to protect downstream land uses. (LCP 179)

2. Urban Fire Hazards: Principal urban fire hazards confronting the City of Morro Bay are: (1) inadequate water supplies in northern sections of the City, (2) poor access in and around the waterfront, especially during the tourist season, (3) response problems associated with operation from one fire station, and (4) the presence of the P.G.&E. power plant and supporting tank facilities. In addition, the jet fuel storage facility located in north Morro Bay may also pose some potential for urban fire hazard. (S modified)

b. Flood Hazards: The HUD Federal Flood Insurance Program established areas of Morro Bay which may be subject to those flooding caused by a 100-year storm. A map of flood prone areas and the model ordinance were prepared and were only recently adopted by the City. The findings of the flood study and mapping concluded that the City suffered from a variety of flooding problems:

1. The lower Morro Creek and Chorro Creek Valleys, now undeveloped, are areas subject to 100-year flood inundation. Flooding of Chorro Creek frequently impacts Twin Bridges on South Bay Boulevard. Emergency response between Morro Bay and Los Osos is restricted during flooding of twin bridges.

Recent Army Corp of Engineers studies have resulted in updated flood maps for Morro Bay. (LCP modified 169)

2. The hillside areas in the northern end of the City area are plagued by development-aggravated drainage problems--undersized culverts under State Highway One, City streets, and some private developments--which cause flood waters to back up and inundate areas upstream from the drainage constrictions.

3. The large open area east of State Highway One between Morro Bay High School and the Atascadero Beach Tract suffers from very poor drainage. During storms, water stands on the marshy property, unable to escape down any drainage courses. The entire area is subject to inundation from the 100-year flood.

4. The site of the high school itself, as well as the site of the City's sewage treatment plant and a portion of PG&E's property--all near the lower reach of Morro Creek as it empties to the sea--are subject to the 100-year flood. (LCP 169)

5. State Highway One, the most critical regional transportation link in Morro Bay, is subject to flooding during a 100-year storm where it crosses Morro Creek and at numerous locations in north Morro Bay where the highway crosses Unnamed and Noname Creeks, the drainage area at the foot of Nevis and Nassau Streets, and at the extreme northern end of the City where Toro Creek meets the highway. (LCP 169)

Figure S-1 is a schematic depiction of the flood prone areas as adapted from the Federal Flood Insurance Rate maps developed for the City of Morro Bay. The map, along with a model Flood Damage Prevention ordinance regulating development activities in flood prone areas, was adopted by the City Council in November, 1979. As yet, however, there are no City policies or standards short of the incremental permit review requirements of the Flood Damage Prevention ordinance, to guide City planning decisions as to the appropriateness of flood prone areas for development or open space uses. (LCP modified)

The City also may construct one or more dams for water storage purposes. At the time of development of those dams, studies should be conducted to assess the potential extent of flooding hazards if dam failures were to occur. (New SH 1.8)

c. Seismic and Geologic Hazards: In addition to primary and secondary seismic hazards, the Safety Element's technical analysis provides a brief discussion of the effects of seismic

hazards. Summary conclusions of these hazards are presented below. The following conclusions are generalized, and are based on investigations of specific structures within the City. Such investigations are, of course, necessary before specific conclusions regarding the safety of any individual structure can be made. (S modified 1.7)

1. Major Faults: The city of Morro Bay is located in a seismically active area.

The states of activity of the major faults effecting Morro Bay have been evaluated using available detailed mapping supplemented by local field examinations and aerial photo study. The evaluation has been made in the context of definitions and procedures established for the Alquist-Priolo Act.

The San Andreas fault is active, and is expected to be the source of a magnitude 8.0 - 8.5 earthquake in the near future. This earthquake would be accompanied by strong ground shaking for one minute or more in Morro Bay that could cause significant damage to older structures. (SS modified)

The Nacimiento fault is seismically active. Data is inadequate to determine the potential for future ground rupture. (SS)

The Rinconada fault is seismically active, but probably not the site of ground rupture in the near future. Data is inconclusive on the latter point, and additional studies would be advisable. (SS modified)

The Hosgri fault is seismically active. Recent studies indicate a possible earthquake of 7.6 magnitude. Additional study of the potential impact of an earthquake caused by the Hosgri fault is necessary.

The San Juan, La Panza, West Huasna, Edna, Indian Knob, San Miguelito, and Edna extended(?) faults are probably inactive. (SS modified)

No active or potentially active faults are known to be present within or adjacent to the City of Morro Bay. (SS modified)

Surface rupture resulting from fault movement is not considered a problem within the city. The city of Morro Bay is located in zone 1 (Plate I; and Plates IA & 2A from County Technical Report) based upon analysis for the County Seismic Safety Element. (SS)

2. Groundshaking: The primary source of strong ground shaking in Morro Bay is expected to be the San Andreas fault which is located 41 miles east of Morro Bay at its closest point. An earthquake of Richter magnitude 8.0 to 8.5 is expected in the near future. Safety and communication systems could be adversely affected. The Nacimiento fault is considered a secondary source of strong ground shaking, but would have negligible effect on Morro Bay. Shaking from earthquakes expected on the Rinconada and Hosgri Faults may not significantly override the severity of shaking expected from the San Andreas fault in the Morro Bay area. Additional studies of the Hosgri Fault may be necessary. (SS modified)

3. Liquefaction: Younger alluvium in the creek bottoms and at the upper ends of the Bay should be considered hazardous with respect to settlement and liquefaction potential. The following is a generalized guide to liquefaction potential intended for use by soils engineers.

<u>Material</u>	<u>Liquefaction Potential</u>	<u>Units on Plate I</u>
Rock	Very low	a, b, c
Terrace deposits, etc.	Low to moderate	d
Recent alluvium	Moderate to high	e, x
		(in part) (SS)

4. Tsunami: For planning purposes, tsunami risk is indicated by potential run up areas. Broadly speaking, this would include any area within one mile of the coast with an elevation of less than 50 feet. This would then include the Embarcadero, and all areas up to State Highway One in the Atascadero Beach area. Due to the sand spit and narrow entrance channel providing protection to the harbor, water level fluctuations here should be minimal. The California Division of Mines and Geology (1972) classifies the Morro Bay coast as "potentially dangerous if tide and tsunami are in phase." The major protection from tsunamis is a system of warning and evacuation. Warning is handled by the U.S. Weather Service and other agencies with evacuation in the hands of the local officials. The primary concern in evacuation is the low lying beach areas north of Coleman Park, heavily used for recreation. (LCP 174)

5. Landslides: Portions of the hillside areas have been identified as a high landslide risk zone. To provide more specific hazard information within this area (Zone F), the City commissioned a detailed geologic analysis which also identified appropriate development standards. These standards are based upon the individual parcels, geologic,

slope and soil characteristics, and ensure development is consistent with Coastal Act Policies. (LCP modified 179)

The special study was conducted by Central Coast Laboratory on a parcel-by-parcel basis for the subdivided areas of the City. In addition, the City currently has a policy that, in unsubdivided areas, a geology study must be conducted to determine landslide potential in Zone F areas. Further, the study divided Zone F into five subzones based on percent slope, landslide evidence other geological hazards and soil types. The five subzones are given generally as follows:

- Sub-Zone 1: Those land areas having slopes less than ten percent, free of landslides and other significant geological hazards and having soil types which are considered only moderately expansive and of low plasticity.
- Sub-Zone 1C: Same as Subzone 1 with soil types which are considered expansive to highly expansive.
- Sub-Zone 2A: Those land areas having slopes of 10 percent to 30 percent, free of landslides and other significant geological hazards which exhibit soil types which are either of volcanic or sandstone origin and exhibit low expansion and plasticity.
- Sub-Zone 2C: Those land areas having slopes of 10 percent to 30 percent, free of landslides and other obvious geological hazards which exhibit soils of high plasticity, medium to high expansion characteristics and moderate to low shear strength when wet.
- Sub-Zone 3: Those land areas having landslides, adverse water conditions, unstable soils, slopes greater than 30 percent or other apparent geological hazards.

With the exception of Sub-Zone 3, minimum foundation standards have been set for subdivided parcels on a parcel-by-parcel basis. For Sub-Zone 3, a detailed soils and geological report must be provided which identifies the hazards and provides for mitigating measures to assure a stable foundation. The report is required to be prepared by a licensed geologist or Certified Engineering Geologist. In addition, any subdivided lots so designated as having fill also must have a soils report prepared by a Registered

Engineer verifying the condition of the fill and the stability of the lot. (LCP modifying)

Note: The subzone maps and the Central Coast Laboratory reports are available from the City Community Development Department. Because of their scale, the maps cannot be reproduced in this document. (LCP 177)

d. Erosion: The community is concerned with the grading of roads on hillsides immediately adjacent to the City. This grading creates scenic impacts, increases erosion and may destabilize existing landslides, posing a threat to downslope development.

Due to the sensitivity of these areas, the Conservation Element (1974) has recommended that the City's Zoning and Subdivision Ordinance be amended to address specific hillside concerns. These include:

- (1) hillside density and slope limits;
- (2) grading and slope stabilization measures;
- (3) open space requirements;
- (4) site design; and
- (5) visual impacts.

The large amount of eroded sediment being deposited within the Morro Bay estuary can pose a severe threat to the biological productivity of this sensitive habitat (see Chapter on Environmentally Sensitive Habitat Areas). A study prepared for the county's Local Coastal Plan, Erosion Sources in the Morro Bay Watershed (1979), has identified agricultural practices within the watershed as a major source of sediment.

To ensure water quality protection, the Central Coast Regional Water Quality Control Board has developed standards relating to construction, agriculture and other activities that may cause erosion in the Morro Bay watershed. These standards, "Best Management Practices" are designed to minimize runoff and erosion. Use of these practices by both the City and the County watershed management plan as identified in the study Erosion and Sediment in Central Coast Watersheds (1979) could significantly reduce sedimentation in Morro Bay. This plan could be developed in conjunction with the Water Management Plan recommended for the Chorro and Morro groundwater basins (see Chapters on Agriculture and Public Works). (LCP 178)

e. Coastal Erosion: Coastal erosion within the community generally is not a problem with the exceptions of the constant shoaling in the harbor, the accretion of sand in the Coleman Park area and bluff erosion in several areas of the city. The harbor shoaling and the accretion of sand result from the naturally occurring littoral drift and wind pattern for this area.

This sand accumulation poses maintenance problems to the City and threatens to inundate Coleman Park. A dune revegetation program has begun for public ownership parcels with Coastal Conservancy financial assistance.

While not bordering the water, the bluff line running from the PG&E Power Plant to Morro Bay State Park is being eroded in some areas. This is due to the sandy nature of the soil making up the bluff. Another bluff line in the community is found along Beachcomber Drive behind Atascadero State Beach.

The Coastal Act requires bluff-top development to be sited and designed to assure structural stability while minimizing alteration of natural land forms. Since the bluff line along Beachcomber Drive is in Atascadero State Beach, the State Department of Parks and Recreation should ensure new development will not alter the existing topography nor contribute to bluff erosion. Special attention should also be paid to access trails down the bluff face to the beach so they do not contribute to bluff erosion. These measures may include revegetation, posting or development of stairways. The City shall also ensure runoff from the road does not add to the erosion. Although the bluff line along Beachcomber Drive is within the jurisdiction of State Parks and Recreation, the City will have the responsibility to review and approve all development proposed by State Parks upon LCP certification. Appropriate policies must be included to guide State Parks and other development consistent with the Coastal Act.

Because most of the existing bluff top fronting the Tidelands Park and Embarcadero has been developed and the visual character which this bluff brings to the waterfront area has been established, setbacks will be based on the site specific standards necessary to ensure structural stability. Alteration of the bluff face and the slope stabilizing vegetation will not be allowed.

However, for commercial development in the Embarcadero that will serve as a connecting link between the waterfront and downtown, development that steps down the bluff face may occur. This must be accomplished without major alteration to the bluff face, though retaining walls may be used. (LCP 179)

f. Radiation Hazards: Since the technical analysis of radiation hazards contained in Volume II of the Safety Element is a general background statement on radiation and nuclear power plants, no major conclusions specific to Morro Bay are provided. It is assumed that an accidental release of harmful levels of radiation is possible. Planning for such an accident is prudent and necessary for public safety. (S modified 1.8)

g. Emergency Preparedness: The San Luis Obispo County and Cities peacetime emergency organizations rely heavily on the concept of mutual aid for responding to major disasters. While the basic planning framework and emergency inventories should be adequate for most disasters, they may prove insufficient when confronted with a major earthquake, widespread flooding, or a large fire.

Mutual aid in San Luis Obispo County provides economical emergency services, but is less than optimally efficient, particularly in the fire-fighting organizations in the County.

Emergency communications between different agencies cooperating under mutual aid agreements may be impaired in a major disaster by the lack of a common emergency communication channel. (S modified 1.8-1.9)

h. Acceptability of Risk: Given that certain natural hazards exist in Morro Bay, it is necessary to decide whether the risks these hazards present are acceptable or whether action is necessary to reduce the level of risk. The Council on Intergovernmental Relations (CIR) defines "Risk" from natural and man-made hazards in three categories:

1. Acceptable Risk: The level of risk below which no specific action by government is deemed to be necessary.
2. Unacceptable Risk: The level of risk above which specific action by government is deemed to be necessary to protect life and property.
3. Avoidable Risk: A risk which need not be taken because individual or public goals can be achieved at the same, or less, total "cost" by other means without taking the risk.

To determine levels of acceptable risk is to provide an answer to the question "How safe is safe enough?" No environment is perfectly hazard-free. Natural and man-made hazards of some kind are always present, especially in urban environments. However, some hazards cause only minimal loss or occur so rarely that they need not be planned for at the community level. On the other hand, some events occur often enough, are large enough, and have the potential for major disruption of the community such that a community-wide response to the risk is called for. Deciding the level of response to natural hazards such as fire and flooding is a public process which involves making a judgment, either explicit or implicit, about acceptable risk. Scientific expertise can determine the magnitude of the hazard and estimate the probable effects, but it cannot decide for the

public how much risk to assume (or not assume by planning for loss-reduction).

The central concept used in determining levels of acceptable risk is the definition of natural events in terms of magnitude and frequency. The magnitude of an event refers to its size. Examples are the height of flood waters, the rating of an earthquake on the Richter scale, or the number of acres burned in a wildland fire. The frequency of an event refers to the number of times it occurs during a certain period of time. The relationship between magnitude and frequency is inverse. That is, the less often an event occurs, the greater is its size and potential impact. For example, rainstorms occur annually in San Luis Obispo County, but most often they are of low magnitude and do not seriously threaten residents. However, on infrequent occasions, as in January and February, 1969, a storm of large magnitude passes over the region and results in a dangerous flood. A way of summarizing this idea with respect to an earthquake is that the longer it waits, the bigger it will be.

The magnitude-frequency concept is involved in the decisions regarding acceptable risk in that the community must judge what magnitude event should be planned for. That judgment is based on the frequency or recurrence interval of the hazardous event. A description of the magnitude and other characteristics of the event are developed through a technical analysis. This information allows planners and engineers to develop loss-reduction measures and to design structures to provide protection up to the level of acceptable risk. In this sense, the magnitude earthquake or flood used in defining acceptable risk may be thought of as a "design earthquake" or "design flood".

The determination of acceptable risk from hazardous events also involves differentiating among man-made structures according to their potential effect on the loss of life and their importance in terms of emergency response and continued community functioning. In the hours immediately following the 1971 San Fernando earthquake in Southern California, emergency services were impaired by damage to police and fire stations, communication networks and utility lines. A number of major hospitals in the area were seriously damaged and were unable to continue functioning at the time they were needed most. These facilities and others are vital to the community's ability to respond to a major disaster and to minimize loss of life and property. The experience in San Fernando emphasizes the need to provide these "critical facilities" a higher level of protection from natural hazards than non-critical structures. Determining which facilities should be considered critical is best accomplished on a jurisdiction-by-jurisdiction basis. This Safety Element for the City of Morro Bay contains a recommended list of critical facilities based on potential effects on loss of life and importance to continued community functioning. The

list from the County Element is reproduced here as Table 5.1.11. Morro Bay's list may vary from this.

By considering both the natural event and the type of land use or facility, a planning framework for making risk decisions can be established. Table S-\* provides a summary of criteria used in the recommended policies of the next section. (S modified 1.10)

TABLE S-1

TAXONOMY OF CRITICAL FACILITIES

Facility	Potential Effect on Loss of Life (Normal)	Required for Community Functioning (Critical)
Dams (future)	X	
Electrical Sub-Stas.		X
Schools	X	
Fire Stations		X
Aqueducts/Pipelines	X	X
Utility Lines		X
County Buildings	X	
City Buildings	X	
Hospitals	X	X
Sewage Treatment Plant		X
Water Works		X
Radio Stations		X
Television Stations		X
Microwave Stations		X
Major Hwys./Bridges	X	X
Power Plants (Fossil)		X
Theaters/Auditoriums and other places of public assembly with over a 100 person capacity	X	X

TABLE S-2

SUMMARY OF RISK CRITERIA

Hazard <sup>1</sup>	Hazard Criteria
Wildland Fire	Risk categories: Extreme, High, Moderate Low, Nil
Urban Fire	Generalized categories not recommended: building-by-building evaluations necessary
Natural Flooding	100-year floodplain
Dam Inundation	Office of Emergency Services; Dam inundation maps.
Seismic/Geologic Hazards	See following discussion

<sup>1</sup>Risk evaluations for radiation hazards are beyond the scope of this Element. (S modified)

## Risk Criteria Associated Seismic/Geologic Hazards:

Qualification of the above foregoing "risk" definitions can be expressed in terms of a magnitude and a recurrence interval for a specific fault system. In Morro Bay, as indicated earlier, we are primarily concerned with the San Andreas fault system. From analysis derived in the County's Technical Report and expanded in the technical section of this report, the following criteria should be utilized as a basis for determining acceptable risk in Morro Bay.

<u>Type of Facility</u>	<u>Magnitude</u>	<u>Fault System</u>	<u>(Richter)</u>
Normal (Residences, commercial, light manufacturing, etc.)		San Andreas	8.0+
Critical (hospitals, communication centers, public building, etc.)		San Andreas	8.0+

Response spectra for the above fault have been included in the technical section of this General Plan. These response spectra should be analyzed by a structural engineer (Building or Safety Dept.) to determine the appropriate modification, if any, to the Morro Bay's uniform Building Code.

It should be stressed, however, that this represents only a recommendation of acceptable risk and the public must ultimately decide on the level of risk they deem acceptable. Further, the public must also decide upon the types of land use that would fall under the facility classifications "normal" and "critical". (SS modified)

### i. Potential Method for Reducing Hazards

1. Fire Hazard Mitigations: There are three basic methods to reduce potential fire hazards: 1) Prevent the source of fires, 2) make structures fire-safe by the use of fire resistant building materials and the provision of fire barriers around buildings near forests, brushland or grassland, and 3) improve the fire-fighting capabilities of the City.

Naturally occurring fires caused by lightning and other non-man-made causes are not within the control of the City or County. Man-made caused fires are often difficult to trace. The penalties for creating a wild-fire are one potential deterrent if the perpetrators are caught.

The use of non-combustible roofing materials for structures located near or adjacent to fire prone open areas would reduce the possibilities of structural fires. Also, the use of fire buffers could protect structures near open lands. In particular, fire "greenbreaks" could be provided around structures adjacent to natural open spaces.

The fire fighting capabilities of the City and County Fire Departments is dependent upon the availability of public funds. (New)

2. Flood Hazard Mitigation: Flooding regulations are strictly regulated by the criteria established by the Federal Department of Housing and Urban Development (HUD). The City's residents cannot receive Federal Flood Insurance unless the City has adopted regulations which meet the HUD criteria for areas subject to a 100-year flood. (New)

3. Earthquake Mitigation: In as much as earthquakes cannot be effectively predicted, preparedness is the prime planning tool to reduce injuries and damages. Structures should be constructed to withstand expected ground motion. Critical structures such as hospitals, police and fire department buildings shall be designed so that they can continue functioning during and after the largest anticipated shaking. Other non-critical structures such as stores and homes shall be designed so that they do not injure occupants in the event of an earthquake.

As with other potential wide-spread disasters, emergency preparedness of both safety agencies and the public is paramount in the event of a major earthquake. The County now has an emergency center which is intended to provide emergency coordination and information in the event of a disaster, whether it involves an earthquake, a fire, a flood or a nuclear radiation release.

The public should be prepared to react quickly in the event of a disaster. The following measures are only a few of the many that are available. Individuals should contact the County Office of Emergency Services. Education of the public is the key to successful actions. The citizens of Morro Bay should follow basic measures of preparedness:

- a. Have a portable radio in order to tune to an Emergency Broadcast System radio station for instructions.
- b. Have flashlights, first aid kits, water, food for several days' meals, wrenches to turn off water and gas, and other emergency provisions.

- c. Have plans for each type of emergency. For example, each household should have a plan for evacuation of the residence and, if necessary, the evacuation of the community. Know where and how to turn off water and gas supplies. (SS Modified)

4. Landslide Mitigation: Development should not be permitted in areas where landslides cannot be controlled. The Local Coastal Plan prohibits new development on slopes over 20 percent and restricts the amount of cut and fill allowed. Geology and soils reports are required on all properties which exhibit a potential for landslide risk. Development should be designed to fit the natural terrain and natural features and native vegetation, such as trees, should be preserved. (New)

5. Erosion Mitigation: The City's grading ordinance should incorporate the applicable standards recommended by the Central Coast Regional Water Quality Control Board. The City should also encourage the County to adopt similar standards for the agricultural areas located within the Morro Bay watershed. Measures should include restrictions of grading in hillside areas during the rainy months, requirements for siltation basins where necessary, effective planting practices and proper drainage devices. (New)

6. Coastal Erosion Mitigation: Development can be protected from the detrimental effects of coastal erosion by instituting regulations for adequate building setbacks from blufftops. Also, drainage systems should be installed to divert storm runoff from bluff faces. (New)

7. Radiation Hazard Mitigation: The County and City have adopted an Emergency Response Plan to deal with potential accidents at the Diablo Canyon Nuclear Power Plant. Measures incorporated in that plan range from taking shelter (by staying indoors and closing all windows and doors) to evacuation of the community. Sirens have been installed throughout the community to warn residents and visitors of an accident at Diablo Canyon. A summary of recommended actions is contained in the "Emergency Response Plan Booklet for the Diablo Canyon Power Plant". Copies of the booklet are available from the San Luis Obispo County Office of Emergency Services. (New)

C. OBJECTIVES, POLICIES AND PROGRAMS

OBJECTIVES:

1. To minimize injury and loss of life.
2. To minimize damage to public and private property.
3. To minimize social and economic dislocations resulting from injuries, loss of life, and property damage. (S)
4. To insure the continuity of vital services and functions. (SS 1.16)

POLICIES AND PROGRAMS:

POLICY S-1: To the extent feasible, the City will ensure that development within the City's jurisdiction is designed to withstand natural and man-made hazards to acceptable levels of risk. (S modified 1.28)

Program S-1.1 The City's building regulations should be reviewed and revised, if necessary, to incorporate new minimum safety requirements regarding seismic resistance, flood proofing, fire proofing, erosion control and protection against radiation hazards. (S modified 1.28)

Program S-1.2: All new construction in the City should, as a minimum, be built according to the most recent safety requirements in the Building Code. (S 1.29)

Program S-1.3: All new public facilities intended to reduce risk from natural or man-made hazards (e.g. flood control projects, fire breaks) should use the planning and technical criteria presented in the Safety Element technical section as basic guidelines. (S modified 1.29)

Program S-1.4: All new development located within areas subject to natural hazards from geologic, flood and fire conditions, shall be located so as to minimize risks to life and property. (LCP 180)

Program S-1.5: All new development shall ensure structural stability while not creating nor contributing to erosion or geologic instability or destruction of the site or surrounding area. (LCP 180)

POLICY S-2: The City should identify and evaluate existing structural hazards, and abate those hazards to acceptable levels of risk where feasible. (S modified 1.28)

Program S-2.1: Structures within the City's jurisdiction should be inspected by qualified structural engineers, fire officials, and flood control officials for susceptibility to damage from fire, flooding, and geologic hazards. Critical facilities should be inspected prior to non-critical facilities, and publicly-owned facilities prior to private facilities. Structural inspections are a major concern of the adopted Seismic Safety Element, and additional inspection criteria relative to seismic hazards are contained in that Element. Susceptibility to damage from flooding should be determined based on the 100-year flood. Fire hazards are best evaluated on a building-by-building basis by qualified inspection personnel. Rigid inspection standards for off-road vehicles (muffler and spark arrester controls) should also be established, and the use of off-road vehicles during periods of high fire danger should be controlled. (S 1.28)

Program S-2.2: Caltrans should review its facilities and roadways within the study area to determine the potential impact of expected earthquakes and floods, and should forward comments to the City. The Circulation Element of the General Plan and potential evacuation routes should be revised, if necessary. (S 1.28)

Program S-2.3: The Pacific Gas and Electric Company should review its facilities and distribution/transformation networks and centers to determine the potential impact of expected earthquakes, and should forward comments to the City. P.G. & E. should also review their gas and power lines for potential fire hazards. (S 1.29)

Program S-2.4: Structures identified as not conforming to amended earthquake standards for as hazardous in terms of fire or flooding should be brought into conformance where feasible with acceptable levels of risk by programs including, but not limited to, structural rehabilitation, occupancy reduction, and demolition and reconstruction. (S modified 1.29)

Program S-2.5: A review committee should be established by the City Council to consider the desirability of initiating condemnation proceedings against structures found to be unsafe. (S modified 1.17)

Program S-2.6: The City should advocate the expansion of State and Federal relocation assistance funds and programs to aid persons and business displaced from hazardous buildings. (S modified 1.29)

POLICY S-3: The City will protect people and structures from injury and destruction from fire within the fiscal and physical limitations of the City. (New)

Program S-3.1: Development should not be permitted to locate in medium wildland fire hazard areas without an investigation of the development's vulnerability to fire and its potential as a source of ignition. Wood frame and other combustible structures, and untreated wood shake roofs, should be prohibited in areas of high fire hazard. Fire greenbreaks should be provided between structures and wildland areas. (S modified 1.29)

Program S-3.2: To improve fire response capabilities in the City, a detailed study of fire flow deficiencies in the City's northern portion should be conducted and recommendations made to increase fire flows to acceptable standards. The City should also consider development of an additional fire station. (S 1.30)

Program S-3.3: Installation of smoke detectors in residences within the City will be required. (S modified 1.31)

Program S-3.4: To improve overall fire protection in the City and County, the City should, as a member of the Area Planning Council, consider reorganization of all fire defense agencies in the County into a single, consolidated fire department. As a minimum, fire departments should be consolidated on a regional basis. Such a consolidated department should act to relieve the California Division of Forestry of fighting structural fires, particularly during the summer months. (S modified 1.30)

Program S-3.5: Education programs in lower grades should be initiated using displays and demonstrations that would educate younger children to the nature and strength of fire. (S modified 1.31)

Program S-3.6: The City may support or sponsor exhibits and presentations in secondary schools which demonstrate the more involved aspects of fire dynamics, i.e., major contributing factors to fire hazard and the relationship of fire to the natural ecology. Encourage parental cooperation and assistance in overall fire education programs. (S modified 1.31)

POLICY S-4: New development should be protected from potential flooding. (New)

Program S-4.1: All development, including construction, excavation and grading, except for flood control projects

and agricultural uses shall be prohibited in the 100-year floodplain areas unless off-setting improvements in accordance with the HUD regulations are required. Development within flood plain areas shall not cause further stream channelization, alignment modifications or less of riparian habitat values consistent with Section 30236 of the Coastal Act. Permitted development shall be consistent with all applicable resource protection policies contained in the Coastal Act and in the City Land Use Plan.

The Land Use Plan Map shall designate the flood prone lands at the western limits of the Morro and Chorro Valleys for agricultural uses.

Developments in the flood prone areas within the City shall include finished floor elevations two feet above the 100-year flood elevation. The heights of permitted development shall be compatible with the character of the surrounding area and not conflict with scenic and visual qualities. (LCP 180-181)

Program S-4.2: Channelizations, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (1) necessary water supply projects, (2) flood control projects where no other method for protecting existing structures in the flood plain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) developments where the primary function is the improvement of fish and wildlife habitat. (LCP 184)

Program S-4.3: In reviewing development proposals of future water impoundments, the City should require (1) an evaluation of potential inundation areas and (2) design of the dam to withstand the earthquakes which can be expected in the area. (S 1.30)

POLICY S-5: The City will continue to enforce measures to ensure that seismic safety hazards are minimized. (New)

Program S-5.1: A program of building inspection should be initiated to identify all unreinforced masonry structures in the City that do not meet modern earthquake standards for construction. (SS modified)

Program S-5.2: The Technical Section of this General Plan should be made available to developers for review and use when land development is proposed. (SS modified)

Program S-5.3: A building strong-motion instrumentation program should be instituted for buildings over six (6) stories in height with an aggregate floor area of 60,000 square feet or more, and every building over ten (10) stories in height regardless of floor area.

Program S-5.4: Emergency communication centers, fire stations, and other emergency service facilities should be examined as to their earthquake resistant capacities. If found below acceptable standards, a program to mitigate potential hazards should be immediately established. (SS)

Program S-5.5: All critical facilities constructed prior to 1948 should be reviewed by a structural engineer for potential hazards. Since many of these structures have regional impact, the source of funding for the inspection program ought to be at the regional level. (SS)

Program S-5.6: Establish a priority system of roads, services and other vital needs in the event of an earthquake disaster. (SS)

Program S-5.7: The City should develop an information release program to familiarize the citizens of the region with the Seismic Safety Element. School Districts and agencies related to aged, handicapped and seismically susceptible industries should be encouraged to develop education programs relative to seismic awareness. (SS)

Program S-5.8: As provided in Chapter 70 of the Uniform Building Code, Morro Bay should retain on a full or part-time basis, a qualified engineering geologist to review reports. (SS modified)

POLICY S-6: Development should be prohibited where landslide risk is likely. Development within hillside areas should be designed so that landslide hazards are reduced or eliminated. (New)

Program S-6.1: Soils reports prepared by a licensed civil engineer with expertise in soils, and geology and reports prepared by a certified engineering geologist shall be required prior to acceptance for filing of development applications in the following areas:

- a. Zone F, subzones 2 and 3;
- b. all areas having fill material on the property;
- c. where there are known or suspected geologic, soils, or hydrologic problems in the immediate vicinity;

- d. In addition, soils and/or geology reports may be required whenever in the judgment of the Chief Building Official, or City Engineer such studies are needed.

The geology and soils reports shall identify and evaluate any hazards present including faults under or near the site, and shall provide for mitigating measures to assure a stable foundation. These reports shall contain statements that the proposed project will not destabilize adjacent or nearby land or improvements or create a public hazard or nuisance. Areas identified in the geology reports as having potentially active land slides or gross instability shall be retained in open space. The soils report shall make recommendations as to the need for any temporary shoring during the construction phase.

Whenever geology and/or soils reports are required, a detailed and accurate topographical and land use map shall be required. Such maps shall be prepared by a licensed professional surveyor and shall show topographical contours at 1' intervals over the entire site and for a distance of not less than 50' outside of the perimeter of the site. The topographical map shall show all existing improvements or structures in the area, individual trees of 6" diameter or greater at four (4) feet in height on the property and within 50 feet of its perimeter, and existing site drainage and watercourses. This map shall be available to the preparers of the geology and soils reports prior to completion of those reports.

Whenever geology and/or soils reports are required, grading, foundation, retaining wall and structural plans shall be designed and prepared by a licensed civil or structural engineer. Grading and excavation plans shall show the elevations of the corners of all proposed structures. The Chief Building Official may require independent peer review of any of the above reports and maps with the cost of such review being borne by the applicant. Whenever geology and/or soils reports are required, sediment and erosion control plans shall also be required.

Prior to issuance of any building permit where geology and soils reports are required, a bond shall be posted with the City in the amount of 150% of the estimated cost of restoring the site to a stable, non-hazardous condition in the event that construction plans are not completed.

A bond shall also be required for sedimentary and erosion control devices required by the City.

The Chief Building Official may require independent special inspections to review grading, fill, retaining wall, foundations or structural work, or erosion controls, with the cost of such special inspections being borne by the applicant. Requirements for any such special inspections shall be noted on the approved plans.

Upon completion of engineered foundations for projects where geology and soils reports were required, the responsible civil or structural engineer shall certify in writing to the City that the foundation was constructed in conformance with the approval structural design.

In addition to the requirements above, all grading and building plans shall conform to relevant sections of the Uniform Building Code, CAL OSHA requirements, and any grading ordinance that may be adopted by the City of Morro Bay

Program S-6.2: Plans for development shall minimize cut and fill operations. Plans showing excessive cutting and filling shall be modified or denied if it is determined that the development could be carried out with less alteration of the natural terrain. (LCP 181)

Program S-6.3: All development shall be designed to fit the site topography, soils, geology, hydrology, and any other existing conditions and be oriented so that grading and other site preparation is kept to an absolute minimum. To accomplish this, structures shall be built to existing natural grade whenever possible. Natural features, landforms, and native vegetation, such as trees, shall be preserved to the maximum extent feasible. Areas of the site which are not suited to development because of known soil, geologic, flood, erosion or other hazards shall remain in project open space. (LCP 181)

POLICY S-7: Measures should be instituted to reduce the incidence of erosion. (New)

Program S-7.1: For permitted grading operations on hillsides, the smallest practical areas of land shall be exposed at any one time during development, and the length of exposure shall be kept to the shortest practicable amount of time. Where a proposed grading operation has the potential for causing significant erosion or sedimentation of water bodies, the grading shall be

commenced and concluded during the dry season of April 1 to October 31 of each year. Grading permits shall include requirements for sediment catch basins, revegetation within a specified period of time and other slope stabilization measures. All measures for capturing sediments and stabilizing slopes including revegetation shall be in place before the beginning of the rainy season, and shall be implemented in conjunction with the initial grading operations.

Program S-7.2: Sediment basins (including debris basins, desilting basins, or silt traps) shall be installed on the project site in conjunction with the initial grading operations and maintained through the development process to remove sediment from runoff waters. Sediment basins shall be in place prior to the commencement of the winter rainy season defined in Program S-7.1. All sediment shall be retained on site unless removed to an appropriate dumping location approved by the City consistent with relevant policies of the Coastal Act and the Morro Bay Local Coastal Program. (LCP 182)

Program S-7.3: Temporary vegetation, seeding, mulching, or other suitable stabilization methods shall be used to protect soils subject to erosion that have been disturbed during grading or development. All cut and fill slopes shall be stabilized immediately with planting of native grasses and shrubs, appropriate nonnative plants, or with accepted landscaping practices. (LCP 182)

Program S-7.4: In permitted development, drainage devices shall be required in order to conduct surface water to storm drains or suitable watercourses to prevent erosion. Drainage devices shall be designed to accommodate increased runoff resulting from modified soil and surface conditions as a result of development. Water runoff shall be retained on-site whenever possible or whenever there is the capability to facilitate groundwater recharge. (LCP 182)

Program S-7.5: Degradation of the water quality of groundwater basins, nearby streams, or wetlands shall not result from development of the site. Pollutants, such as chemicals, fuels, lubricants, raw sewage, and other harmful waste, shall not be discharged into or alongside coastal streams or wetlands either during or after construction. (LCP 183)

Program S-7.6: To protect the sensitive Morro Bay Estuary, the City shall require all development including any interim agricultural uses to follow the Best Management Practices of the Regional Water Quality Board within the City limits and will urge the County to adopt the use of Best Management Practices for all land uses within the Morro Bay watershed.

These Best Management Practices, as determined by the Regional Water Quality Control Board, are designed to minimize runoff and erosion. (LCP 183)

Program S-7.7: The City shall also urge the County and other appropriate public agencies to develop a Watershed Management Plan to review all land uses within the watershed for potential impacts on water quality and quantity. (LCP 183)

POLICY S-8: Guidelines should be established to ensure safe development along coastal bluffs. (New)

Program S-8.1: All development along bluffs shall be adequately setback to ensure protection of the development for its economic life and development shall not require alteration of the existing bluff land form or beach. New development shall assure stability and structural integrity, and neither create nor contribute significantly to erosion or geologic instability by accomplishing the following:

(1) Bluff-top setbacks shall be determined from a site-specific geology report prepared by a Registered Engineering Geologist. The report shall set forth recommendations for building setbacks which shall ensure structural stability and integrity without altering bluff land form or necessitating the construction of protective devices such as seawalls for the life of the development (75-100 years). (LCP modified)

(2) The face of the bluff and vegetation or fill material stabilizing the slope shall not be altered. (LCP 183)

Program S-8.2: All new development on bluff tops shall be required to install drainage systems to carry runoff inland to the nearest public street. In areas where the topography prevents such conveyance, because additional filling or grading would create greater adverse environmental or visual impacts, private bluff drainage seaward should be permitted if the drainage system is said to accommodate drainage from adjacent parcels and the system is designed to minimize visual impacts utilizing natural coloring, natural landforms and vegetative planting to hide the system. (LCP 183-84)

Program S-8.3: Development shall not be permitted on the bluff face except for the above drainage systems and for engineered staircases or accessways to provide public beach access and pipelines for scientific research or coastal-dependent industry. To the maximum extent feasible, these structures shall be designed to minimize alteration of the bluff and beach. (LCP 184)

Program S-8.4: In the Embarcadero area between Surf Street and Anchor Streets, development may be stepped down the bluff face. However, the development shall not require the construction of protective devices or retaining walls that would alter natural landforms or impede public access. (LCP 184)

POLICY S-9: The City should be prepared in the event of a major nuclear accident at the Diablo Canyon Nuclear Power Plant. (New)

Program S-9.1: The City should review its Emergency Response Plan to anticipate emergency services which may be required, under mutual aid agreements, in the event of a radiological accident at the Diablo Canyon Nuclear Power Generating Station. (S modified 1.30)

POLICY S-10: The City will review and upgrade the Safety Element on a regular basis. (New S 1.31)

...: Upon adoption of the Safety Element, a review committee should be established to oversee the implementation of the Element and to advise the City Council of implementation progress. This committee should be composed of the Community Development Director, the Building Official, Personnel Director (the Safety Director), and at least one representative from each of the police and fire protection service agencies. (S modified 1.31)

Program 10.2: The Safety Element should be reviewed by the Community Development Department annually and should be comprehensively revised every five years or whenever substantially new scientific evidence becomes available. (S modified 1.31)

Program 10.3: In the next regular update of the Safety Element, an analysis of potential evacuation routes will be conducted in compliance with Government Code Section 65302 (g). In addition, peakload water supply requirements and clearances around structures will be studied as will the new available data regarding the Hosgri Fault. Any new problems or issues which are discovered will be reflected in revised or additional policies and programs. (New)

POLICY S-11: The City should educate the public in the nature and extent of natural hazards in the area and in ways of minimizing the effects of natural disasters. (New S 1.30)

Program S-11.1: Develop an information release program to familiarize the citizens of Morro Bay. Special attention should be afforded to those groups particularly susceptible

to seismic, fire, and flooding hazards including, but not limited to, school districts, agencies involved with the aged, and agencies involved with handicapped persons. These agencies should be encouraged to develop educational programs of their own relative to hazard awareness. The conclusions and recommendations of these elements should also be provided to land developers and those involved in the real estate profession. (S 1.30)

Program S-11.2: Establish community programs that train volunteers to assist police, fire, and civil defense personnel during and after a major earthquake, fire, or flood. (S 1.31)