VII. Safety & Hazardous Waste Management

A. INTRODUCTION

Public safety is one of the primary responsibilities of government. A risk-free environment is not possible, because we cannot always predict the forces of nature or the strength of man-made structures and effectiveness of preventative measures. Determinations of reasonable levels of safety involve tradeoffs of cost, public inconvenience and limitations on the use of private property. The Safety Element sets forth the City's goals and policies which are intended to minimize risk to people and property associated with natural and man-made hazards.

B. GEOLOGIC AND SEISMIC HAZARDS

BACKGROUND

Earthquake Faults and Surface Rupture

The San Andreas fault lies approximately two miles west of the San Mateo City boundary. Despite its close proximity, there is no evidence of significant ground rupturing in the City during the last one million years. There are no known active faults in San Mateo, and inactive faults which are present are older features which do not exhibit indications of recent motion. There is no reason to expect a recurrence of movement along these other fault traces.

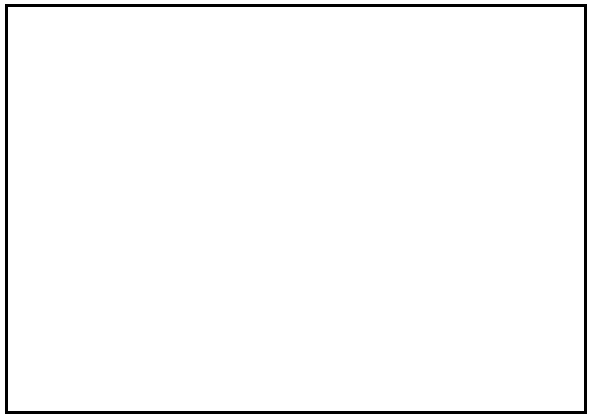
Ground Shaking and Seismically Induced Waves

Past earthquakes have shown that often the underlying soil conditions pose a greater hazard to structures than the proximity to a fault. Ground shaking from an earthquake is amplified and lasts longer in unconsolidated or water saturated soils such as bay mud than in harder bedrock (see Figure S-1). Ground shaking can cause structural failure of buildings in moderate to severe earthquakes, particularly older structures built prior to the establishment of seismic safety standards in 1933. Masonry buildings are particularly vulnerable to the lateral motion of earthquakes unless properly reinforced. In 1989, the City's Building Inspection Division identified 25 unreinforced masonry structures which may be seismically hazardous. All but two of these buildings are located downtown, predominantly on East Third Avenue, Second Avenue and B Street. As of September 1995, seven of these buildings have completed seismic retrofitting to increase stability in an earthquake, and four others are under construction. A list of these buildings is available in the Building Inspection Division.

Concrete tilt-up buildings constructed prior to 1973 may be vulnerable to structural damage due to ground shaking. The City has approximately 40 such buildings, a number of which have been retrofitted since the Loma Prieta earthquake in 1989. Most steel and wood frame buildings, due to their lighter materials and flexibility, have an excellent performance record.

Beyond structural failure, building features which may be hazardous in the event of an earthquake include exterior parapets and ornamentation and large windows. Other potentially dangerous effects of ground shaking may include separation of buildings from their foundations, falling furniture and suspended ceilings, and collapsed chimneys. Freeway overpasses are also critical structures which may collapse in a major earthquake.

The Loma Prieta earthquake on October 17, 1989, measured 7.1 on the Richter scale and had an epicenter located between Santa Cruz and San Jose. San Mateo sustained substantial building damage, but no fatalities. Earthquake damage in the City was estimated at approximately $240 million, which included $100 million in structural damage and the remainder due to damage to building contents. One unreinforced masonry building in the downtown experienced structural failure of parapet walls causing significant but repairable damage. Several concrete tilt-up structures and other buildings also experienced structural damage, but all can be repaired.
Extensive interior damage was caused by falling ceiling tiles, broken glass, and toppled furnishings. Numerous steel and concrete buildings had cracking of the concrete fascia, but no major structural damage. There were approximately 200 chimneys which failed or had significant damage.
While this earthquake resulted in substantial damage, it is important to note that its magnitude was classified as a "major" earthquake. The force of a great earthquake, similar to the 1906 San Francisco earthquake which is estimated to have been 8.3 on the Richter scale, would have been at least 16 times greater than the Loma Prieta earthquake. An earthquake of this magnitude would have a tremendous and long-term impact on the operations and financial health of the City.



In 1906, all unreinforced masonry buildings suffered major damage, requiring reconstruction or demolition.

The ground shaking of earthquakes can also cause water related hazards known as tsunamis and seiches. Tsunamis are sea waves commonly accompanying large submarine earthquakes. Such underwater fault ruptures are generally not present along the California coast. The likelihood of a major tsunami created near Alaska causing flooding of the San Mateo bayfront is very remote since a wave 20 feet in height at the Golden Gate would be necessary to reach Coyote Point. The area of inundation from such a tsunami is shown on Figure S-4.

A seiche is an earthquake induced water wave in a confined body of water, such as swimming pools, water storage tanks, or reservoirs. Even in large bodies of water, seiches typically are less than one foot high. The potential for overtopping of Crystal Springs Reservoir is very remote and would not pose a flooding danger. There are approximately 20 water supply tanks in San Mateo, most of which are covered.

Ground Failure: Landslides, Mudslides and Liquefaction

Slope failure is usually associated with heavy rainfall or a major earthquake. In the Bay Area, landslides most commonly occur on slopes greater than 15%. Grading activities which increase slope or alter drainage patterns often contribute to landslides. San Mateo's western hills are generally stable. Past known slope failures, which number over 50, have primarily occurred in the Laurelwood, Highlands and Country Club Heights areas, and are indicated on Figure S-2. Although past landslides have caused property damage, no loss of lives or dwellings has occurred.

Another form of ground failure is liquefaction, which occurs as a result of an earthquake when grains of soil become saturated. The soils become unstable and may behave as a liquid, causing sudden ground failure. Liquefaction can be particularly destructive to building foundations. Two common engineering practices to minimize these effects are to support buildings on piles driven through filled soils to bedrock or on "floating" foundations designed to shift with the altered soils. In San Mateo, the risk of liquefaction is highest on former baylands which were filled, which extends as far west as El Camino Real (SR 82) as shown on Figure S-2. Areas of particular concern include former sand beds or tidal channels indicated in Appendix P.

Other Geologic Problems: Ground Settlement and Erosion

Other geologic processes occur in San Mateo which may not be life-threatening, but nonetheless cause damage to property and the environment. Ground settlement results from the compaction of unconsolidated soils, causing buildings and foundations to crack, and utility lines to separate. In San Mateo, ground settlement typically occurs on filled baylands in the eastern portion of the City. Mitigating measures include proper soil compaction, construction methods such as pile driving or floating foundations, and allowance of settlement in the design of utilities.

Soil erosion and the resulting sedimentation of creeks and storm drains are natural processes which can be greatly accelerated by human activities such as grading, vegetation clearing and poorly engineered drainage systems. This problem is most critical in the western hills, and can be controlled through development restrictions and engineering techniques.

GOALS AND POLICIES

GOAL 1: Take steps to protect the community from unreasonable risk to life and property caused by seismic and geologic hazards.

POLICIES:

S 1.1: **Geologic Hazards.** Require site specific geotechnical and engineering studies, subject to the review and approval of the City Engineer and Building Official, for development proposed on sites identified in Figure S-2 as having moderate or high potential for ground failure. Permit development in areas of potential geologic hazards only where it can be demonstrated that the project will not be endangered by, nor contribute to, the hazardous condition on the site or on adjacent properties.

Figure S-2 identifies those areas of the City which may be subject to ground failure. If development is proposed, detailed geotechnical and engineering studies are necessary to determine if the development is appropriate to the particular site and to evaluate potential impacts on adjoining properties. In most cases, mitigation measures may be imposed, dictating certain engineering methods for appropriate building foundation construction and drainage control.

S 1.2: **Hillside Development Standards.** Regulate hillside development consistent with the City's Site Development Code and Open Space/Conservation Policy 3.1.

Most of San Mateo's western hills were subdivided during the 1950's and 1960's, some including slopes over 25% grade. During this subdivision process numerous lots were created which far exceeded the minimum lot size standards, and therefore could have been further subdivided. However, most of these "remainder" parcels were left unsubdivided due to their steep slopes, poor accessibility, and/or poor soil conditions. With the increasing cost of housing, subdivision and development of the "remainder" parcels in the western hills has become feasible. Development of steeply sloped property poses greater risks than relatively flat land. It typically involves substantial grading and alteration of the existing topography, which may affect the stability of adjoining property and alter local drainage patterns. If not properly engineered, a new structure may crack and separate in the event of seismic activity or landslide.

While these problems may be mitigated by proper engineering techniques, slope development has visual impacts on adjoining property owners and on more distant vistas. Open Space/Conservation Policy 3.1 discusses development on steep slopes in relation to density, the clustering of development to preserve steep slopes for open space, the preservation of existing topography by limiting cut and fill, and the visibility of new hillside development. The Site Development Code seeks to minimize risk of harm to persons or property by requiring appropriate engineering and/or hydrologic studies and recommendations for development located on slopes 15% or greater, or within a slope setback area as defined in the Code.

S 1.3: **Erosion Control.** Require erosion control measures for all development sites where grading activities are occurring, including those having landslide deposits, past erosion problems, the potential for storm water quality impacts, or slopes of 15% or greater which are to be altered. Control measures shall retain natural topographic and physical features of the site if feasible.

The impacts of erosion and altered drainage patterns can be most critical on land which has shown a tendency towards landsliding, where existing erosion gullies are apparent or on very steep slopes that

have a 15% or greater grade. On such sites, an engineering study of erosion control will be required in conjunction with new development proposals.

S 1.4: **Unreinforced Masonry Buildings.** Establish and maintain a program which requires mandatory modifications of existing unreinforced masonry buildings identified as being potentially hazardous, and similar unsafe building conditions, to reduce the associated life safety hazards. The design of building modifications should be in keeping with character of existing architecture.

Unreinforced masonry buildings typically suffer life-threatening damage during great earthquakes. State law requires that local governments identify unreinforced masonry buildings and adopt a program to abate such life-threatening conditions. San Mateo's 25 unreinforced masonry structures are predominantly located in the downtown, and 9 have been identified as having historic significance.

San Mateo's proposed seismic program would require a two-phase improvement program for all unreinforced masonry buildings. Installation of wall anchors would be required within three years. More complete renovations would be required within seven years for buildings having an occupant load exceeding 100 persons, and eight years for lower occupancy buildings. The second stage improvements would bring the high occupancy buildings up to approximately 75% of current seismic design standards for new buildings, and lower occupancy buildings to 50% of current standards.

The cost of rehabilitating unreinforced masonry structures is substantial, ranging from $5 to $25 per square foot in 1989 as estimated by the Seismic Safety Commission. The total cost for seismic reinforcing of San Mateo's 27 structures, excluding Chope Hospital, was estimated at $3.5 million in 1989.

While the costs of seismic upgrading may be substantial, it is the City's preference that the buildings, particularly those with historic value, be retained and improved. The City's policies with regard to historic preservation are contained in the Open Space/Conservation Element. Towards this end, the City will attempt to direct property owners towards sources of federal and state funds and tax credit programs, as well as local private lending institutions.

C. FLOOD HAZARDS

BACKGROUND

Stormwater Drainage

Storm water drains through San Mateo to the Bay via three distinct drainage basins -- the San Mateo Creek complex, North San Mateo complex, and the Marina Lagoon Complex, each composed of numerous stream channels, culverts, and storm drainage piping systems.

The San Mateo Creek drainage basin is 35 square miles in size, only 4 square miles of which are in San Mateo. Approximately 30% of the City drains into San Mateo Creek. Storm flows are regulated in the upper reaches of the creek by Lower Crystal Springs Dam and the two reservoirs it creates. The San Francisco Water Department controls winter and springtime releases from the dam to approximately 1,000 cubic feet per second (cfs), which is the capacity of the creek channel at Polhemus Bridge. Uncontrolled releases could occur if reservoir levels exceed the storage capacity during a major storm. The maximum uncontrolled discharge which could occur is 5,460 cfs, which would result in severe downstream flooding.

Apart from releases from Crystal Springs Reservoir, a peak calculated 100-year flood of 1,956 cfs could be generated from the watershed above El Camino Real (SR 82). Between El Camino Real (SR 82) and the bay are six bridges which have inadequate capacity to contain the maximum 100-year flood. The first constriction is the Mills Culvert beneath El Camino Real (SR 82) and to San Mateo Drive, which can accommodate only 1,400 cfs. Excess storm water would flow northeastward from El Camino Real (SR 82) towards the Bay, as indicated in Figure S-3. Average flooding depths from a peak storm of 1,956 cfs would be from one to three feet.

The San Mateo Creek watershed within the city limits is fully urbanized, and little additional runoff is anticipated from new development. Most of the remaining watershed are conservation lands to protect the water quality of Crystal Springs Reservoirs and will remain undeveloped.

The northern portion of the City drains to the bay via major piping systems in Poplar and Peninsula avenues. The southern two-thirds of San Mateo composes a 10-square-mile watershed which originates in the western hills of San Mateo and Belmont, and drains into Marina Lagoon. Peak storm flows from the western hills are controlled by four dams, three on Laurel Creek and one in the Town of Hillsborough above Borel Creek. The watershed is almost entirely urbanized with the exception of Sugarloaf Mountain, and little increase in runoff due to future development is anticipated. Control of erosion and impervious surfaces on Sugarloaf is important to reduce runoff into Laurel Creek.

In the past, flooding has occurred at several locations within the Marina Lagoon drainage complex due to inadequate channel and storage capacities or blockages during storms. In the 1970's, Laurel Creek Dam was overtopped, flooding a substantial portion of the San Mateo Village neighborhood. In the 1980's, East Laurel Creek Dam was overtopped, damaging homes immediately downstream. San Mateo Village was also flooded in 1955, 1966 and 1982.

Localized street flooding has also occurred in Fiesta Gardens along Kent Street and Saratoga Drive, along Alameda between Ventura Avenue and 31st Avenue, along the south side of SR 92, between Alameda and Elkhorn Court, near 25th Avenue and El Camino (SR 82), and in the Aragon/Maple neighborhood, east of Alameda. Localized flooding generally occurs due to the blockage of catch basins by leaves and other debris during periods of heavy rainfall. Potential flooding boundaries are indicated in Figure S-3.

Marina Lagoon was created from Seal Slough for flood control in the 1950's and deepened in 1965. Although heavy storm runoff never overtopped the Marina Lagoon levees, the water elevation rose to dangerous heights in 1974 and 1982. In 1984 the pump capacity at the Lagoon's entry into the Bay was increased to a maximum discharge capacity of 750,000 cfs, adequate to contain the 100-year storm and flooding in the Marina Lagoon drainage area. Improvements have been made to several storm drainage facilities including: East 40th Avenue storm drain, Pasadena storm drain, and Poplar Avenue storm drain.

These improvements along with additional ongoing storm drain improvements will help reduce localized street flooding during heavy rainfall.

Bay Water Flooding

Tidal Action

Levees along the San Mateo shoreline protect low-lying development east of US 101 from the effects of tidal fluctuations. The land area east of the freeway has ground elevations of -2.0 feet (San Mateo datum/0.36 feet NGVD) and above. The Bayfront Dike has the following elevations:

	San Mateo datum*	NGVD
San Mateo Creek to Coyote Point	10 ft.	12.36 ft.
San Mateo Creek	5 ft.	7.36 ft.
Former Landfill site	8 ft.	10.36 ft.
San Mateo Water Quality Control Plant	8 ft.	10.36 ft.
Third Avenue	10 ft.	12.36 ft.

NOTE: San Mateo datum is 2.36 feet lower than the National Geodetic Vertical Datum (NGVD)

Sea level may rise in the future due to global warming trends. A 1986 study for the San Francisco Bay Conservation and Development Commission (BCDC) predicts a four to five-inch rise over the next 50 years. The U. S. Army Corps of Engineers recommends a dike elevation of 8 feet (San Mateo datum/10.36 ft. NGVD) for San Mateo, which includes calculation for freeboard, settlement and wave runup. By this standard, the height of the Bayfront Dike is inadequate in the area of San Mateo Creek.

Flooding is possible from the combined effects of high tides and very heavy storm flows. In San Mateo, only San Mateo Creek is affected by tidal action, although a tide gate system has been installed for emergency situations. The system would not be completely effective against the severe event of a 100-year storm and 100-year high tide occurring simultaneously. Flooding has not occurred in the past as a result of these conditions.

Tsunami

Tsunamis, or seismically generated sea waves, are rare in California due to the lack of submarine earthquake faults. An Alaskan generated tsunami would have to reach a height of at least 20 feet at the Golden Gate to overtop San Mateo's levees with a minimum runup of five feet at higher high tide. The highest tsunami affecting the area during the last 120 years had a height of 7.4 feet at the Golden Gate, causing a two-foot runup along the San Mateo shoreline.

Dike Failure

San Mateo's levees are structurally stable, and the probability of their failure is very low. However, failure could result from a major earthquake or severe storm conditions. Should a failure occur at high tide, property could be inundated up to an elevation of 4.7 feet (San Mateo datum/7.06 ft. NGVD), or a maximum water depth of about six feet in the lowest areas of the Shoreview neighborhood. The area of potential inundation is shown in Figure S-4.

Dam Failure

Six dams affect San Mateo: Crystal Springs, San Andreas, Laurel Creek and East Laurel Creek(2), and Tobin Creek in Hillsborough.

Lower Crystal Springs Dam retains water supply for San Francisco and most cities within San Mateo County. In 1977, the seismic safety of the dam was studied, finding that the risk of structural damage to the dam in a maximum 8.3 Richter magnitude earthquake is low, and that landslides which might be triggered by such an earthquake would not generate waves capable of overtopping the dam. Although the probability of Lower Crystal Spring Dam's failure is remote, should such an event occur, the San Mateo Area Office of Emergency Services (OES) estimates that a population of 70,000 would be affected, with inundation occurring from the downtown area north to the Burlingame Recreation Lagoon and south to the Ralston Avenue/US 101 interchange. The area of potential inundation is shown in Figure S-4.

San Andreas Dam is located on San Andreas Creek in Burlingame and is also used to impound water for San Francisco and much of San Mateo County. Seismic safety studies in 1979 and 1983 indicated that the dam would probably remain stable during strong seismic shaking.

Laurel Creek Dam is located at the end of Laurelwood Drive and reduces the peak storm water runoff of 600 cfs in half. The most recent reports by the California Division of Safety of Dams (DSOD) indicate that the dam is structurally safe and will perform without failure during a major seismic event.

East Laurel Creek Dam is located at the end of East Laurel Creek Drive, and is also used to control peak storm runoff. The dam is too small to be regulated by DSOD and its seismic stability is unknown. Two other small dams are located in Belmont (East Laurel Creek) and in Hillsborough (Tobin Creek).

GOALS AND POLICIES

GOAL 2: Protect the community from unreasonable risk to life and property caused by flood hazards.

POLICIES:

S 2.1: **Creek Alteration.** Prohibit any reduction of creek channel capacity, impoundment or diversion of creek channel flows which would adversely affect adjacent properties or the degree of flooding. Prevent erosion of creek banks.

Most of San Mateo's creeks are under private ownership, with adjacent properties extending to the centerline of the creeks. Development of these parcels should not result in alteration of the creeks in a way that could alter the creek capacity or water flow characteristics. Such activities have the potential for causing downstream flooding or may increase bank erosion.

S 2.2: **Development Adjacent to Creeks.** Protect new development adjacent to creeks by requiring adequate building setbacks from creek banks and provision of access easements for creek maintenance purposes.

A creek setback for new structures is necessary for adequate maintenance access, to permit creek improvements and to protect buildings from creek bank erosion. The Downtown Specific Plan requires a setback along San Mateo Creek for flood protection and maintenance purposes. As hydrologic studies are completed for other creeks and drainage channels, setback and maintenance access requirements will be developed as appropriate.

S 2.3: **Development Within Flood Plains.** Protect new development within a creek flood plain by locating new habitable floor area above the 100-year flood-water level or by incorporating other flood-proofing measures consistent with Federal Emergency Management Agency (FEMA) regulations.

The City does not have any FEMA designated flood plains. If flood plains are designated by FEMA in the future, properties located within the 100-year flood plain should be required to locate habitable floorspace above the projected flood elevation to minimize possible property damage consistent with FEMA regulations. Additions of less than 50% of the value of existing structures would be exempt. Other means of flood-proofing structures should be explored by the City.

S 2.4: **Crystal Springs Reservoir.** Encourage the City of San Francisco to develop an operations model or capital improvement for the entire San Francisco Water Supply System and Lower Crystal Springs Reservoir to allow acceptance of heavy and prolonged stormwater runoff without the necessity of releasing hazardous volumes of stormwater into San Mateo Creek.

The San Francisco Water Department controls the release of water from Lower Crystal Springs Reservoir to maintain flood storage capacity in the event of a major storm. However, a precise operations model for the reservoir has never been prepared, which would calculate winter storm runoff quantities flowing into the reservoir and provide for controlled drawdown of the reservoir in anticipation of peak storm conditions. If the capacity of the reservoir is exceeded and uncontrolled discharge occurs, major portions of San Mateo would be severely flooded.

An alternative would be to add additional height to the dam spillway to retain a higher water level in the event of a major storm and defer discharge to non-storm periods.

S 2.5: **Comprehensive Drainage Study.** Conduct a comprehensive drainage study of San Mateo's seven watershed areas to improve and maintain drainage capacity adequate to convey the design storm. Include consideration of creek maintenance and an education and/or enforcement program to minimize illegal dumping of debris and chemicals.

While a hydrologic analysis has been done for San Mateo Creek, such a comprehensive study of flooding potential and identification of needed improvements has not been done for the complex of creeks which

drain into Marina Lagoon. The adequacy of the City's local stormwater collection system should also be analyzed for necessary improvements. At the south end of Marina Lagoon, the 1950 flap gate structure should be considered for replacement to improve Lagoon water quality and reduce siltation.

S 2.6: **Lowlands Protection.** Protect lowlands from the potential rise in the sea level, high tides and tsunamis. Raise levees to a minimum elevation of 8 feet (San Mateo datum) and construct other tide protection works. Protect new habitable buildings in areas subject to flooding in the event of levee failure.

Recent studies of expected sea level rise and recommendations of the Army Corps of Engineers indicate that portions of San Mateo's Bayfront Dike will need to be raised to an elevation of 8 feet (San Mateo datum/10.36 ft. NGVD) for long-term protection from tidal flooding. Consideration should also be given to protection of new construction by elevating habitable floor levels above potential flood heights.

D. WILD FIRE HAZARDS

BACKGROUND

Wildland fire hazards in San Mateo exist in the few remaining undeveloped portions of the western hills, which include Sugarloaf Mountain, Laurel Creek Canyon, portions of the unincorporated Highlands area and the Parrott Drive area adjacent to Hillsborough (see Figure S-5). These areas are subject to wildland type fires due to existing vegetation, particularly chaparral, the steep slopes and the temperate climate with dry summer months. During the past 15 years only one significant fire has occurred. It burned 20 acres in the Laurel Creek Canyon watershed and caused limited residential damage. Although recent fires have not occurred, these areas pose substantial risks to nearby residences and to the natural environment.

Urban fire hazards and water supply requirements are discussed in the Land Use Element.

GOALS AND POLICIES

GOAL 3: Maintain adequate fire and life safety protection from wildland fires.

POLICY:

S 3.1: **Wildland Fire Plan.** Establish a wildland fire plan for all sites identified in the Safety Element on Figure S-5 which are subject to wild fire hazards. Require all development adjacent to wildlands to provide fire retardant roofing materials, adequate site access, and fire breaks of at least 30 feet.

Fire retardant roofing materials reduce the spread of fire by wind-borne embers, and "greenbelt" landscaping using irrigated, non-combustible plant species, at a minimum radius of 30 feet surrounding

the structures, acts as a fire break. Adequate site access for fire suppression vehicles, particularly to steeply sloped areas, is also very important. Current standards require a minimum 20-foot roadway, exclusive of parking. Generally two access routes are required unless other mitigation, such as fire sprinklers, are incorporated into buildings. Access ways exceeding 300 feet in length must have turnarounds with radii adequate for fire vehicles.

E. EMERGENCY OPERATIONS

BACKGROUND

The City prepared a Multi-Hazard Functional Plan (MHFP) in 1995 as required by the California Emergency Services Act. It defines the City's planned response to emergency situations such as fire, earthquake, flood, hazardous materials spill, civil disturbance or war.

The City's Emergency Operations Center (EOC) is located at the Police Department at 2000 South Delaware. The center contains emergency supplies and equipment and would serve as a communications and administrative headquarters. Since the EOC is located in the flood plain, an alternate EOC is located at Fire Station 7, 1801 De Anza Boulevard. The MHFP identifies fourteen possible shelter locations at school sites, including the College of San Mateo.

GOALS AND POLICIES

GOAL 4: Minimize potential damage to life, environment and property through timely, well-prepared and well-coordinated emergency preparedness, response plans and programs.

POLICIES:

S 4.1: **Emergency Readiness.** Maintain the City's emergency readiness and response capabilities, especially regarding hazardous materials spills, natural gas pipeline ruptures, earthquakes, and flooding due to dam failure, tsunami, peak storms and like failure. Increase public awareness of potential hazards and the City's emergency readiness and response program.

Emergency readiness depends upon maintenance of an updated and useable Multi-Hazard Functional Plan, trained personnel through frequent emergency drills, and functional emergency equipment, particularly emergency communications, power supplies and vehicles. The public should be made aware of potential dangers, particularly those living or working in areas subject to inundation, and of contingency plans or information sources.

S 4.2: **Evacuation Routes.** Maintain adequate evacuation routes as identified by arterial streets shown in the Circulation Element, Figure C-1.

In the event of an emergency, the major arterial streets identified in the Circulation Element would serve as principal evacuation routes. Routes which parallel US 101 and SR 92 are particularly important since they would provide a backup to the freeway in the event overpasses collapse or are blocked.

F. HAZARDOUS MATERIALS

BACKGROUND

Much of the economic success of the Bay area is based on research and manufacturing processes, the byproducts of which include substances which may be harmful to people and to the surrounding environment. Hazardous waste ranges from familiar substances such as waste oil and cleaning solvents, to highly toxic industrial compounds, and include toxic metals, gases, flammable and explosive liquids and solids, corrosive materials, radioactive materials and infectious biological waste.

Up until 1990, the management of hazardous waste relied heavily upon land disposal of untreated materials. With the elimination of this option, reduction of waste volumes or recycling waste compounds for reuse has become the preferred strategies.

In 1989, a majority of cities in San Mateo County approved the San Mateo County Hazardous Waste Management Plan (HWMP). The HWMP emphasizes waste reduction and recycling, extensive educational processes, coordinated identification, permitting and inspection of waste generators, and creation of a permanent facility for deposit of household hazardous waste. A major feature of the plan is the identification of sites suitable for various types of hazardous waste management facilities.

This portion of the General Plan constitutes the City of San Mateo Hazardous Waste Management Plan as provided for in Section 25135 of the California Health and Safety Code. The County HWMP is incorporated into the General Plan by this reference, and major provisions of that plan are summarized below.

Existing Waste Generation

In 1986, San Mateo County generated 35,490 tons of hazardous waste for transport to designated treatment, storage or disposal facilities. Approximately 18% of the waste stream was treated and disposed of in San Mateo County, primarily at the Romic Chemical Corporation in East Palo Alto. In 1989, there were 139 permitted hazardous waste generators in the City of San Mateo, roughly half of which were service stations (49) which generate waste oil and dry cleaners (15) which generate solutions with organic residues. The City of San Mateo contributed less than 1% to the county's waste stream in 1986, generating about 350 tons of hazardous waste in that year.

Most of the waste generators in San Mateo are small quantity generators -- small businesses and households which generate less than 12 tons per year. While this is beneficial from the standpoint of waste quantities created, many small generators do not dispose of waste in a proper or legal manner due to lack of knowledge or adequate enforcement. To facilitate the safe handling of hazardous waste from

small generators, the HWMP proposes programs which would provide educational brochures for businesses and households, increase efforts at identifying all waste generating firms, and establish a household hazardous waste transfer station which would operate on a semi-permanent basis.

Existing Waste Management Capacity

In 1986, 82% of the County's hazardous wastes, or approximately 29,000 tons, was exported to management facilities elsewhere in California or other states. However, approximately 59,000 tons of waste was imported into the county for treatment, principally at the Romic Chemical Corporation. This means that San Mateo County was a net waste importer. This is important since State legislation provides that counties that do not meet their "fair-share" responsibility for accepting hazardous waste must approve new treatment facilities.

Projected Waste Generation and Management Capacity

In the year 2000, San Mateo County is projected to generate approximately 55,025 tons of hazardous waste (a 55% increase over 1986 volumes), of which 83% will be from commercial and industrial sources, 13% from household sources, and 4% from clean-up of contaminated sites. It is estimated that waste reduction and recycling activities could reduce commercial/industrial waste generation by 10%-40%.

The capacity for waste treatment in San Mateo County should increase to at least 95,480 tons by the year 2000 due to expansion in operating capacity of the Romic Corporation. This means that the County will be a net waste importer, by a margin of almost 2:1, thus meeting its fair share responsibilities for the future and providing cities with much more flexibility in reviewing proposed waste management facilities.

Siting Waste Management Facilities

The HWMP provided criteria for the siting of new hazardous waste management facilities, and indicates the areas which appear initially suitable for locating new facilities. In general, the siting criteria direct new facility development away from areas having significant natural hazard potential (landslides, potable water supplies, aquifers, high soil permeability); environmental resources (wetlands, riparian corridors, wildlife reserves and prime agricultural land); and population concentrations (residential zones). New facilities would be allowed in industrial areas near transportation corridors and hazardous waste generators to minimize transport through a community.

In the City of San Mateo, the HWMP has designated 15 areas which are zoned for either commercial or industrial uses as suitable for waste treatment, recycling, storage and transfer facilities (see Figure S-5). Incinerators and residual repositories would not be permitted in San Mateo. The sites designated for treatment, recycling, storage and transfer facilities are located in manufacturing districts adjacent to the Southern Pacific rail corridor. Sites designated for storage and transfer facilities only are in service commercial zoning districts adjacent to the rail corridor, west of US 101 on Amphlett, and in Coyote Point Park.

Due to the highly developed nature of San Mateo and the lack of large waste generating firms, it is unlikely that a large treatment or recycling facility will attempt to locate in the City. However, should an application be filed to locate a hazardous waste facility in San Mateo, a detailed process would be

initiated including preparation of a site specific risk assessment analyzing short- and long-term risks associated with the proposed facility. If the risk assessment reveals that potential risks cannot be adequately mitigated, a proposal may be disapproved even if it is located within a general area which has been designated in the HWMP as a potentially suitable site for a hazardous waste facility.

Contaminated Sites

Many properties in the county and in the City of San Mateo are contaminated by hazardous waste infiltrating into the soil and groundwater supply due to faulty underground storage tanks or illegal disposal techniques. A 1989 list of contaminated sites published by the State Office of Planning and Research identified 46 sites in San Mateo as being contaminated, mostly from underground tanks. These sites are in various stages of clean-up through efforts of the County Department of Health, the State Department of Health Services, the San Francisco Regional Water Quality Control Board, and private property owners. The County has adopted an ordinance which requires improved underground storage tanks which include double containment vessels and spill monitoring apparatus.

Transportation Routes

Hazardous waste primarily is transported within San Mateo via trucks. Since the County is both an importer and exporter of wastes, there is a significant potential for accidental release of wastes in transit. Local government is pre-empted from regulating the transport of hazardous wastes on State highways, which include US 101, SR 92 and I-280. Jurisdiction is under the California Department of Transportation (CalTrans) with enforcement by the California Highway Patrol. Local agencies have the authority to restrict the use of local roads for waste transport, as well as the time of transit, if not unduly restrictive to commerce.

Generally, selection of transportation routes should minimize the time and distance that hazardous waste is in transit, avoid residential neighborhoods and environmentally sensitive areas, avoid periods and areas of traffic congestion, minimize use of local roads and provide for adequate emergency response services.

Emergency Response

The high volumes of hazardous materials handled and transported in San Mateo County pose a significant risk of accidental release or spill.

The San Mateo County Area Emergency Services Council has principal responsibility for emergency response coordination. The Council was established by a joint powers agreement of the County and all cities within the county, and has adopted a Hazardous Materials Area Plan which establishes responsibilities and actions for responding to a wide range of hazardous material incidents. If an incident were to occur in the City of San Mateo, the San Mateo Police Department would act as incident command, unless it occurred on a State highway under the authority of the California Highway Patrol. The local agency would be assisted by the South County Fire Authority, which maintains a fully equipped hazardous materials response vehicle to identify the hazardous material and provide initial containment. Technical assistance would also be provided by the County Environmental Health Section.

GOALS AND POLICIES

GOAL 5: Protect the community's health, safety and welfare relating to the use, storage, transport, and disposal of hazardous materials.

POLICIES:

S 5.1: **County Cooperation.** Cooperate with the County of San Mateo in the regulation of hazardous materials and transportation of such material in San Mateo.

State legislation has designated counties as the level of government to assume the lead role in subregional planning for hazardous waste management. The San Mateo County Departments of Health, Environmental Management, Public Works and District Attorneys Office have direct responsibilities for planning and implementing the County Hazardous Waste Management Plan on behalf of all cities in the County.

S 5.2: **County Hazardous Waste Management Plan.** Adopt by reference all goals, policies, implementation measures, and supporting data contained in the San Mateo County Hazardous Waste Management Plan.

The County Hazardous Waste Management Plan (HWMP) establishes a comprehensive approach to management of hazardous wastes in San Mateo County, including siting criteria for new waste management facilities, educational and enforcement efforts to minimize and control the waste stream, and maintenance of a unified data base on waste generators. Other policies adopted by the City of San Mateo will elaborate and further define aspects of the County HWMP which reflect local conditions and objectives, but which are consistent with the overall direction of the County HWMP.

S 5.3: **On-site Waste Treatment.** Promote on-site treatment of hazardous wastes by waste generators to minimize the use of hazardous materials and the transfer of waste for off site treatment.

The optimal methods of hazardous waste management are either source reduction, such as substituting alternative raw materials or altering production processes to reduce the amount of wastes generated, or on-site recycling, which reuses the generated waste in the production process or as a marketable byproduct. The HWMP has adopted a goal of a 40% reduction in waste generation by the year 2000 through educational efforts including preparation of informational pamphlets, the sponsoring of seminars on alternative technologies, and directly assisting firms in assessing their reduction potential, and by requiring large waste generators to submit waste reduction plans.

S 5.4: **Transportation Routes.** Restrict the transportation of hazardous materials and waste to truck routes designated in Circulation Policy C-1.3, and limit such transportation to non-commute hours.

Risks associated with hazardous waste spills are exacerbated during transportation since such spills would be uncontained and could affect a substantial population of motorists, pedestrians and occupants of nearby residences and businesses. Transportation during peak commute hours increases risks due to the increased surrounding population, increased accident potential during such hours, and the difficulty in

obtaining emergency response through traffic congestion. Transportation through local, residential streets is unacceptable due to the risks posed to residents.

S 5.5: **Regulating Hazardous Waste Management Facilities.** Regulate the location and operation of hazardous waste management facilities through the issuance of a special use permit.

The development of hazardous waste management facilities which accept waste from off-site generators should require the issuance of a discretionary use permit to allow for individual consideration of applications for new waste management facilities and their impacts on nearby land uses, transportation routes and the environment.

S 5.6: **Siting of Hazardous Waste Management Facilities.** Restrict the possible location of new hazardous waste management facilities to those areas designated on Figure S-5. Prohibit the location of residual repository and incineration facilities in the City of San Mateo due to proximity to residential uses. Consider allowing waste treatment, transfer and storage facilities in manufacturing districts only, and allowing waste transfer and storage facilities in service commercial districts. The location of waste management facilities in the City should be based on the ratings of area suitability contained in Appendix Q.

The County HWMP has indicated fifteen areas within the City of San Mateo which are suitable for the location of new off-site hazardous waste management facilities based on siting criteria contained in the Plan. These areas are shown on Figure S-5, and are limited to manufacturing and service commercial land use designations which would typically allow the types of businesses which use hazardous materials. In addition, the City has established a matrix of various constraints affecting these areas, and has rated the relative suitability of the areas as a guide to future applicants and decision-makers. This matrix is included as Appendix Q.

S 5.7: **Design of Hazardous Waste Management Facilities.** Require the following features and mitigation measures in the design of proposed hazardous waste management facilities to minimize potential health, safety and aesthetic impacts on surrounding properties and occupants:

a. For sites located in areas subject to flooding or inundation as shown on Figures S-3 & 4, require facilities to have a surface elevation at least 1.5 feet above the maximum flood water level for areas containing hazardous substances or to be flood-proofed in some other manner suitable to the City.

b. Require facilities to provide for full on-site containment of maximum permitted quantities of hazardous substances, including protection of storm drain or sanitary sewer inlets from accidental entry of hazardous materials.

c. Require facilities to provide separate storage and/or treatment of potentially reactive substances, including separate spill containment vessels. Require that storage of hazardous gasses provides for adequate filtration and neutralization devices to prohibit accidental release of toxic substances.

d. Require that all storage and treatment occur within an enclosed structure.

The design of hazardous waste management facilities should mitigate many potential impacts of such facilities, including the possibilities of off-site chemical spills or gas releases, dangerous reactions of chemicals when accidentally mixed, or the entry of hazardous substances into the storm or sanitary sewer systems. To offer further protection from accidental release and as an aesthetic consideration, storage of hazardous materials should not be permitted outside a building.

S 5.8: **Risk Assessment.** Require the preparation of a risk assessment to determine site suitability for applications for hazardous waste management facilities, establishing the distance requirements from public assembly, residential or immobile population and recreational areas or structures; impacts from seismic, geologic and flood hazards; impacts on wetlands, endangered species, air quality and emergency response capabilities; and proximity to major transport routes.

The process for review of applications for hazardous waste management facilities requires the preparation of a risk assessment for consideration by the decision-making bodies to determine the suitability of the site for the proposed facility and necessary mitigation measures if the installation is permitted. The HWMP does not contain distance requirements for waste management facilities from sensitive land uses, such as residences or areas of assembly, due to differing characteristics of each waste management facility. Distance requirements for a facility which stores waste oil would be very different from a facility storing toxic gases. These distance requirements will have to be determined by the risk assessment, evaluating the specific facility proposed and the characteristics of the surrounding environment.

S 5.9: **Shared Data.** Investigate means of sharing County data on businesses which store hazardous substances with local emergency service providers, such as the Police and Fire departments, as well as the Public Works Department for the wastewater source control program.

The first emergency units which would respond to a local emergency would be the San Mateo Police and Fire departments. These units should have adequate information sources to determine the location and types of hazardous substances which are likely to be encountered at commercial and institutional locations throughout the City. The Public Works Department would need to respond to hazardous substances that may impact the City's Wastewater Treatment Plant or stormwater drainage system.

S 5.10: **Contaminated Sites.** Require the clean-up of contaminated sites indicated on the Hazardous Waste and Substances Sites List published by the State Office of Planning and Research in conjunction with substantial site development or redevelopment, where feasible.

Sites within San Mateo which are contaminated with hazardous substances are threats to the quality of ground water aquifers and should be cleaned through decontamination of soils and filtration of ground water. Clean-up should be required in conjunction with redevelopment of the property or major expansions of existing uses.

S 5.11: **Cost Recovery.** Require businesses which generate hazardous waste or applicants for hazardous waste management facilities to pay necessary costs for implementation of the HWMP programs and for application costs, and to pay for costs associated with emergency response services in the event of a hazardous material release, to the extent permitted by law.

Provisions of State law allow for cost recovery for permitting and enforcement actions for hazardous waste generators, and for costs associated with applications for new hazardous waste management facilities. Application costs for hazardous waste management facilities would include regulatory fees, license fees, fees relating to the environmental review process, costs of required public notice, costs of the citizens local advisory committee, and continuing monitoring fees. In addition, the costs associated with emergency response services, which might include spill containment, traffic control and area evacuation, should be passed on to the business operator having responsibility for the hazardous material released.