

CHAPTER

8

HEALTH AND SAFETY ELEMENT

INTRODUCTION

This Element addresses a wide range of issues related to human health and safety. The topics addressed here include geologic and seismic hazards, flooding, hazardous materials, public protection, disaster planning, and fire hazards. The overall intent of this Element is to protect persons and their property by identifying potential hazards within the community, minimizing these potential risks whenever possible, and providing for appropriate and timely response in cases of catastrophic events.

General Description of the Element and Various Components/Sections

A Health and Safety Element is a required element of the General Plan. It establishes a framework of objectives, policies and implementation programs that will be the basis for proficient land use planning to reduce unreasonable risks and protect public health and welfare.

In accordance with the State General Plan Guidelines, the Health and Safety Element includes maps of known hazards including seismic and geologic hazards, floodplains, and potential fire hazards. This chapter addresses ground shaking, fault displacement, liquefaction, subsidence, levee and dam failure, tsunamis, hazardous

materials, fire hazards, and public protection and disaster planning.

Organization of the Element

The Health and Safety Element is organized into three main sections; 1) an Introduction section that includes an overview of the element and its consistency with State law; 2) a Goals, Policies and Implementation Programs section covering the following five categories: geologic and seismic hazards, flood hazards, fire hazards, hazardous materials, and public protection and disaster planning; and 3) a Settings section that describes existing conditions in each of the five categories described above.

Consistency with State Law

California Government Code Section 65302(g) requires that a Health and Safety element be included in a General Plan, and more specifically mandates that the element address the following:

"...the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, tsunami, seiches, and dam failure; slope instability leading to mudslides and landslides; subsidence, liquefaction and other seismic hazards identified pursuant to Chapter 7.8 (commencing

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with Section 2690) of the Public Resources Code, 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 geologic and fire hazards.... "

This element has been prepared in conformance with all mandatory requirements of state law. Specific topics addressed include:

- ❑ Geologic formations and soil types
- ❑ Seismic hazards, including surface faulting, seismic shaking, ground failure, and liquefaction
- ❑ 100-Year floodplain locations
- ❑ Flood hazards, including stormwater and tidal inundation, tsunami and seiches, subsidence, and canal, dam and levee failure
- ❑ Wildland and urban fire hazards
- ❑ Disaster Planning

Relationship to Other Elements of the General Plan

The Health and Safety Element is expected to affect land use policies and hence is coordinated with the Land Use Element. Health and safety considerations may affect the Open Space and Conservation and Public Services and Facilities Elements, and may present additional justification for lowering density in conjunction with land use decisions, based partly on seismic and flood risk. The Health and Safety Element is also related to the Housing and Circulation Elements in that it discusses hazards that may affect decision-making in these issue areas.

GOALS, POLICIES AND PROGRAMS

I. GEOLOGY AND SEISMIC HAZARDS

Goal 8.1

Protect human life, reduce the potential for serious injury, and minimize the risk of property losses from the effects of earthquakes, including fault rupture, ground shaking, and liquefaction-induced ground failure.

Policy 8.1.1

Existing and new buildings, structures, and walls within the City shall meet minimum seismic safety standards.

Policy 8.1.2

Projects within areas of potential significant seismic activity shall provide detailed geologic, geologic-seismic and soils studies by a Registered Geologist (RG), Certified Engineering Geologist (CEG), and/or Geotechnical Engineer to evaluate geologic-seismic and soils conditions, as well as ground shaking and liquefaction potential.

Policy 8.1.3

The development of structures in areas of high liquefaction potential shall be contingent on geologic and engineering studies which: 1) define and delineate potentially hazardous geologic and/or soils conditions, 2) recommend means of mitigating these adverse conditions; and 3) provide implementation of the mitigation measures.

Policy 8.1.4

All new buildings, structures, and walls shall conform to the latest seismic and geologic safety structural standards of the California Building Code.

Policy 8.1.5

Prohibit the erection of critical structures and facilities whose loss would substantially affect the public safety or the provision of needed services, in areas where there is a high risk of severe damage in the event of an earthquake (due to ground shaking, liquefaction, etc.) unless appropriate engineering and construction practices are applied to ensure structural stability.

Program 8.1.A

Structures intended for human occupancy shall be adequately set back from active and potentially active faults as appropriate. Ensure that minimum setbacks take into account the varying degree of seismic risk and the consequences of failure.

Program 8.1.B

Through the environmental review process, new development shall provide comprehensive geologic, seismic, and/or soils and engineering studies for any critical structure proposed for construction in areas subject to groundshaking, fault displacement, ground failure, or liquefaction.

Program 8.1.C

Within one (1) year, amend the zoning ordinance to include standards for the repair or replacement of un-reinforced masonry structures.

II. FLOOD HAZARDS

Goal 8.2

Protect public safety and minimize the risk to life and property from flooding.

Policy 8.2.1

New development shall provide site plans that identify all floodplains, flood hazards, and other natural drainages.

Program 8.2.A

Ensure that potential flooding impacts, including on-site flood damage, and potential inundation, are adequately addressed through the environmental review process and appropriate mitigation measures are imposed.

Program 8.2.B

Implement a development review process that will ensure any new construction within the 100-year floodplain or possible inundation areas will not compromise the health, safety, and welfare of the community.

III. FIRE HAZARDS

Goal 8.3

Reduce the risk of personal injury, loss of life, and property damage resulting from fires.

Policy 8.3.1

Fire protection services and facilities shall provide adequate protection and response throughout the Greenfield Planning Area.

Policy 8.3.2

New development shall furnish water systems which meet city, county, and state residual fire flow requirements and adequate on-site water storage as determined by the Greenfield Fire Protection District.

Policy 8.3.3

New development shall have adequate access for fire fighting and emergency equipment, as determined by the Fire Protection District.

Program 8.3.A

Adopt and enforce building and fire prevention codes that require property owners to reduce fire hazards on their properties.

Program 8.3.B

Ensure that the planning and design of new developments minimizes the risks of fire and includes adequate provisions for vegetation management, emergency access, fire fighting, and fire suppression.

Program 8.3.C

Work collaboratively with other jurisdictions and agencies to reduce fire hazards in Greenfield, with emphasis on prevention and suppression.

IV. HAZARDOUS MATERIALS

Goal 8.4

Provide protection from hazards associated with the use, transport, treatment, and disposal of hazardous substances.

Policy 8.4.1

Identify and address hazardous waste releases from private companies or public agencies.

Policy 8.4.2

Adopt regulations for the storage of hazardous materials and wastes in the City including secondary contaminant and periodic examination for all storage of toxic materials.

Policy 8.4.3

Industrial facilities shall be constructed and operated in accordance with up-to-date safety and environmental protection standards.

Policy 8.4.4

Industries which store and process hazardous materials shall provide a sufficient buffer zone between the installation and the property boundaries to protect public safety, as determined by the City Building official, with recommendations of the Fire Chief and County Health Department.

Policy 8.4.5

New developments shall evaluate the presence or absence of naturally occurring asbestos and mitigate any impacts.

Program 8.4.A

Encourage the State Department of Health Services and the California Highway Patrol to review permits for radioactive materials on a regular basis and to promulgate and enforce public safety standards for the use of these materials, including the placarding of transport vehicles.

Program 8.4.B

Request that State and Federal agencies with responsibilities for regulating the transportation of hazardous materials review regulations and procedures, in cooperation with the City, to determine means of mitigating the public safety hazard in urbanized areas.

Program 8.4.C

Prior to site improvements for properties that are suspected or known to contain hazardous materials and sites that are listed on or identified on any hazardous material/waste database search shall require that the site and surrounding area be reviewed, tested, and remediated for potential hazardous materials in accordance with all local, state, and federal regulations.

V. AIR QUALITY

Goal 8.5

Minimize the air pollutants and toxic air emissions created by implementation of the General Plan.

Policy 8.5.1

Support the reduction of air pollutants through land use, transportation, and energy use planning.

Policy 8.5.2

Encourage transportation modes that minimize contaminant emissions from motor vehicle use.

Policy 8.5.3

Implement the General Plan to be consistent with the pollution reduction goals of the Air Quality Management Plan (AQMP) for the Monterey Bay Region, as periodically updated.

Policy 8.5.4

New development shall be located and designed to conserve air quality and minimize direct and indirect emissions of air contaminants, including diesel emissions.

Program 8.5.A

Minimize impacts of new development by reviewing development proposals for potential impacts pursuant to CEQA and the Monterey Bay Unified Air Pollution Control District CEQA Guidelines. Apply land use and transportation planning techniques such as:

- Incorporation of public transit stops;
- Pedestrian and bicycle linkage to commercial centers, employment centers, schools, and parks;
- Preferential parking for car pools and van pools;
- Traffic flow improvements; and
- Employer trip reduction programs.

Program 8.5.B

Control dust and particulate matter by implementing the Monterey Bay Unified Air Pollution Control District fugitive dust control measures, including:

- Restricting outdoor storage of fine particulate matter;
- Requiring liners for truck beds and covering of loads;
- Controlling construction activities and emissions from unpaved areas; and
- Paving areas used for vehicle maneuvering.

In addition, the City shall address construction and operational diesel exhaust impacts in consultation with the Air District, and the need for risk assessments, when conditions warrant.

Program 8.5.C

Work with the Monterey Bay Unified Air Pollution Control District, the Association of Monterey Bay Area Governments (AMBAG) and, to the extent feasible, meet federal and State air quality standards for all pollutants. To ensure that new measures can be practically enforced in the region, participate in future amendments and updates of the Air Quality Management Plan (AQMP) for the Monterey Bay Region.

VI. PUBLIC PROTECTION AND DISASTER PLANNING

Goal 8.6

Provide for a continued high level of public protection services and coordination of disaster services.

Policy 8.6.1

The Office of Emergency Services, in cooperation with the City and public protection agencies, shall delineate evacuation routes and, where possible, alternate routes around points of congestion or where road failure could occur.

Policy 8.6.2

In order to ensure prompt public protection services, address numbers shall be required to be easily seen from the street or road.

Policy 8.6.3

High-occupancy buildings over two stories in height shall provide adequate access for medical emergency equipment.

Policy 8.6.4

Design and construct all buildings greater than two-stories so that the evacuation of occupants and the creation of a safe environment in case of a substantial disaster, such as a severe earthquake or fire, are provided for.

Program 8.6.A

In cooperation with adjacent cities and public protection agencies, delineate evacuation routes, emergency vehicle routes for disaster response and, where possible, alternative routes where congestion or road failure could occur.

Program 8.6.B

Major developments shall not be approved if fire-fighting services are not available or are not adequate for the area.

Program 8.6.C

Update the City of Greenfield Emergency Response Plan that identifies specific response procedures and responsibilities for responding to emergency situations and includes regular testing of the Plan at appropriate intervals.

Program 8.6.D

Adopt a development standard for residential, commercial, and industrial land uses requiring visible addresses for all future structures.

SETTING

Topics discussed below include Geology, Seismic Hazards, Flood Hazards, Fire Hazards, Hazardous Materials and Waste, Air Quality, Naturally occurring Asbestos, and Public Protection and Disaster Planning.

STRUCTURAL COMPATIBILITY

Among the most basic strategies for reducing risk of property damage and

injuries to persons is ensuring land uses are sited in appropriate locations. Specifically, sensitive land uses and critical public facilities should not be located in areas that are highly susceptible to damage due to seismic events, ground failure, flooding or other known hazards.

Table 8-1 provides guidelines for siting of critical facilities. In reviewing development proposals, the City will consider the compatibility of proposed uses, and the known risk of hazards as documented on **Figures 8-1** through **8-4** and other available sources of information.

**Table 8-1
Critical Structures Compatibility**

Level of Acceptable Risk	Types of Structures	Siting Criteria
1. Extremely Low	Structures whose continued functioning is critical, or whose failure might be catastrophic; power inter-tie systems, plants manufacturing or storing explosives or toxic materials, etc.	Not in critical areas
2. Slightly Higher than in level 1	Structures whose use is critically needed after a disaster: important utility centers: hospitals, police stations, emergency communication facilities, fire stations, small dams, and critical transportation elements such as bridges and overpasses.	Not recommended in critical areas
3. Lowest Possible Risk to Occupants of the Structure	Structures of high occupancy, or whose use after a disaster would be particularly convenient: schools, churches, theaters, large hotels, and other high-rise buildings housing large numbers of people, other places normally attracting large concentrations of people, civic buildings such as fire stations, secondary utility structures, large commercial enterprises, most roads, alternative or non-critical bridges and overpasses.	In critical area with proper mitigation
4. An "Ordinary" Level of risks to occupants of the structure	The vast majority of structures: most commercial and industrial buildings, small hotels and apartment buildings, and single-family residences.	In all areas, built to appropriate design standards.

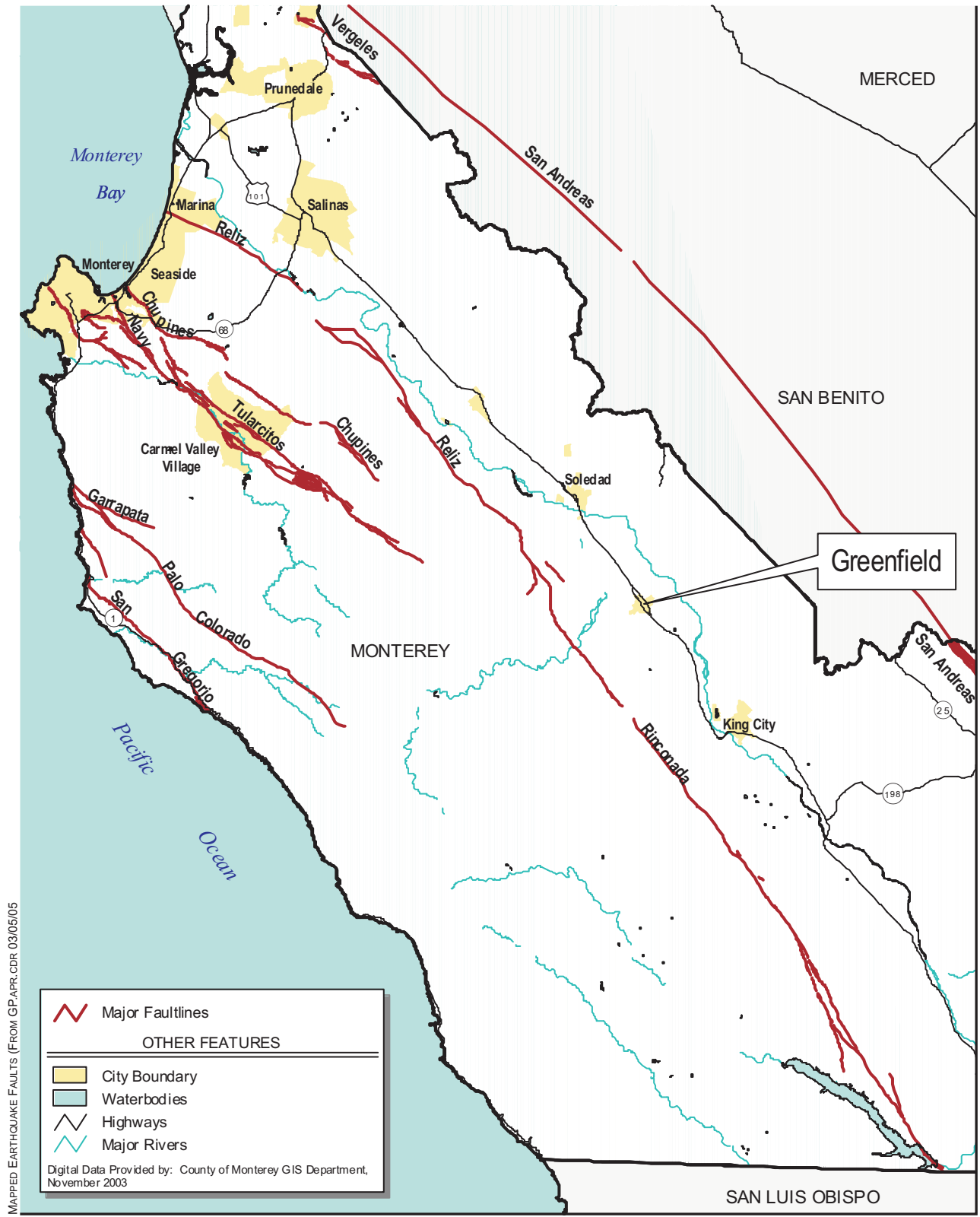


FIGURE 8.1
REGIONAL FAULT MAP

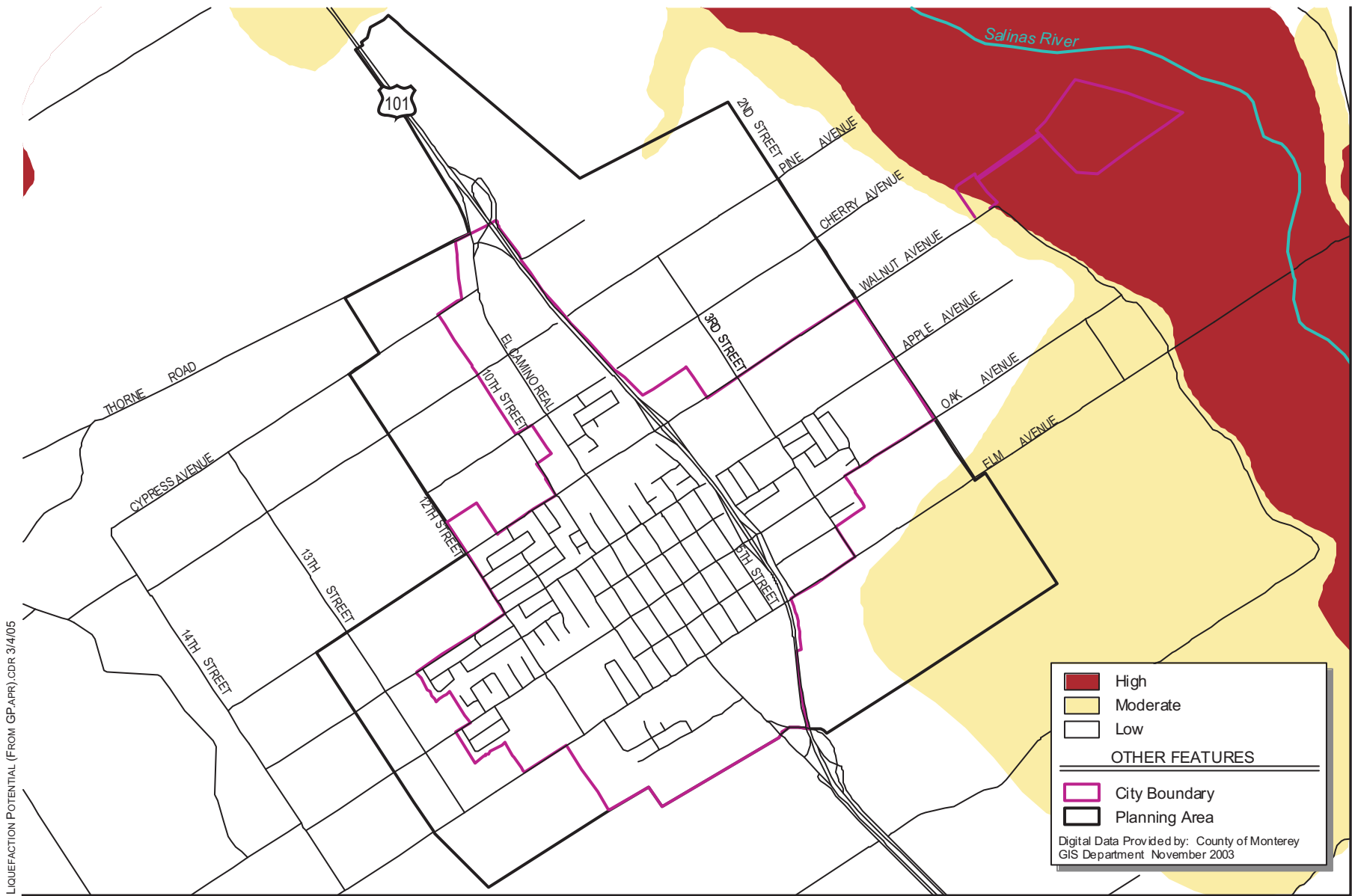
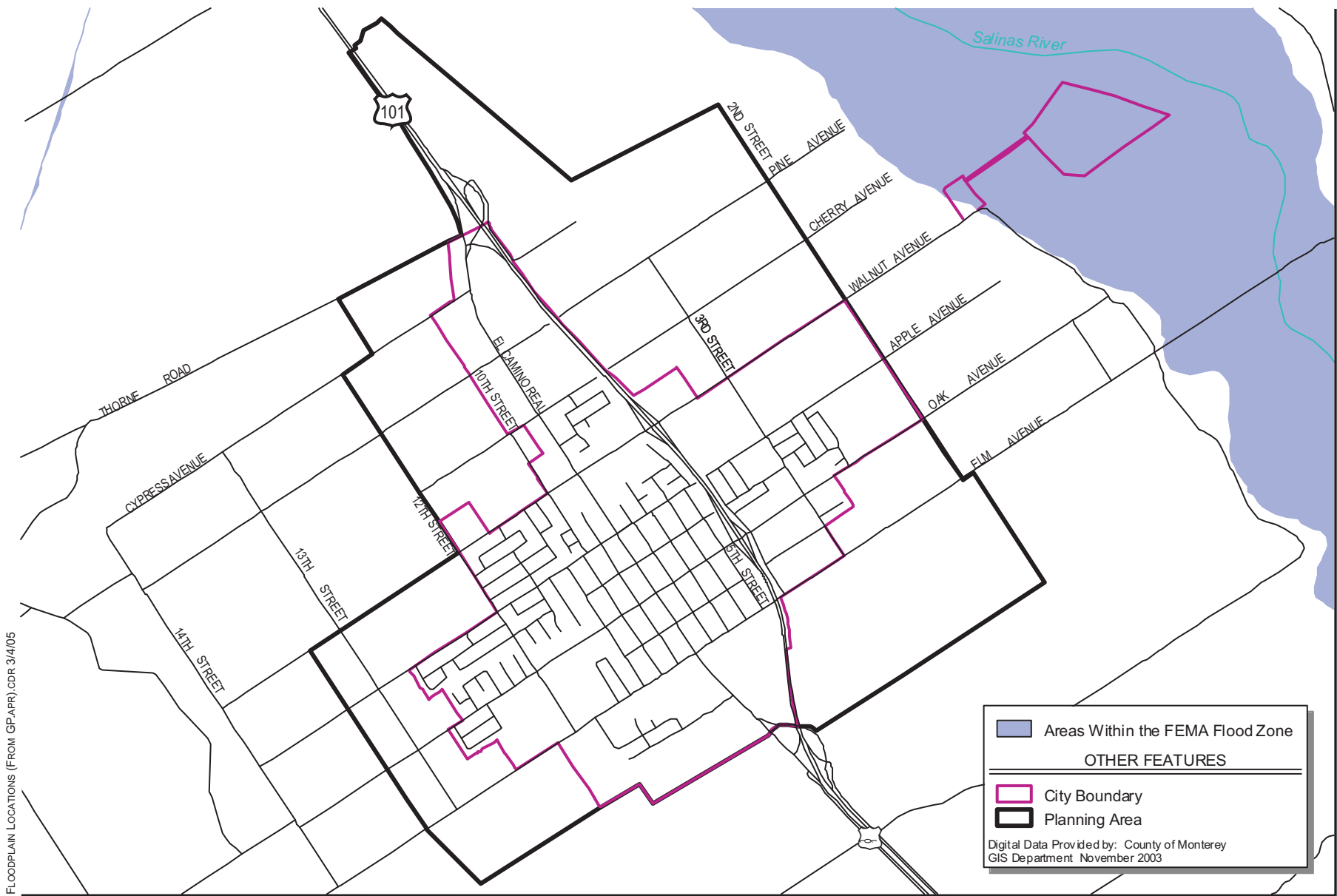


FIGURE 8-2
ESTIMATED LIQUEFACTION POTENTIAL

PMC

PACIFIC MUNICIPAL
CONSULTANTS



FLOODPLAIN LOCATIONS (FROM GP_APP).CDF. 3/4/05



FIGURE 8-3
100 YEAR FLOODPLAIN

PMC

PACIFIC MUNICIPAL
CONSULTANTS

LOCATION OF POTENTIALLY HAZARDOUS MATERIALS.CDR (FROM LAND USE.APR) 03/04/05



FIGURE 8-4
LOCATION OF POTENTIALLY HAZARDOUS MATERIALS

GEOLOGY

The City of Greenfield is located in the central portion of the broad and primarily flat Salinas Valley. Located in the Coast Ranges Geomorphic Province of California, the Salinas Valley is bounded by the Santa Lucia Range on the southwest and the Gabilan Range on the northeast. The orientation of these topographic features parallels the region's northwest trending structural grain. The majority of the Greenfield Planning Area is comprised of Quaternary alluvial deposits. The sediments, which consist of sands, gravels and clays, represent interfingered fluvial deposits derived from the Salinas River and Arroyo Seco Creek and alluvial fan deposits emanating from the Santa Lucia Range.

SEISMIC HAZARDS

The City of Greenfield is located within the Central Salinas Valley, which is bordered on the east by the San Andreas Fault. Because of the likelihood of an earthquake along its length, the San Andreas has been classified as an "active" fault as per the Alquist-Priolo Special Studies Zones Act of 1972. Many faults not classified as "active" by the Alquist-Priolo Act are still considered by geologists to be active and capable of inflicting severe loss of life and property.

The closest potentially active fault to the City of Greenfield is the Reliz/Rinconada fault. No known historical earthquakes have occurred on this fault; however, evidence exists of late Quaternary activity. A maximum expected magnitude earthquake of 7.3 on the Richter scale has been attributed to this fault. Historical data regarding seismically induced ground failures in northern California (Youd and Hoose, 1978) shows no recorded ground failures within the City of Greenfield. Table 8-2 illustrates active and potentially active faults near the City of Greenfield.

Severe earthquakes are characteristically accompanied by surface faulting and less commonly by tsunamis and seiches. Flooding may also be triggered by dam or levee failure resulting from an earthquake, or by seismically induced settlement or subsidence. All of these geologic effects are capable of causing property damages and risks to life and safety of persons.

A major earthquake could have the potential to cause the failure of the San Antonio or Nacimiento dam structures. Upon failure, water would spill out quickly and head generally northeast to the low-lying land of the Central Salinas Valley. It is assumed that the City of Greenfield and the adjacent vicinity would be significantly affected in the event of total dam failure.

**Table 8-2
Earthquake Faults**

Fault	Distance From Greenfield (Miles)	Fault Length (Miles)	Maximum Magnitude
Rinconada	6	113	7.3
Reliez/Rinconada	10	118	7.3
San Andreas (Creeping)	14	75	5.0
Monterey Bay-Tularcitos	16	51	7.1
Calaveras (Southern)	20	64	6.2
Hosgri	29	103	7.3
Quien Sabe	29	14	6.5
Palo Colorado-Sur	30	50	7.0
Ortialita	34	40	6.9
Zayante-Vergeles	34	35	6.8

Source: California Department of Mines and Geology

Ground Shaking

Severe damage can result from ground rupture along a fault trace or from severe ground shaking for any sustained amount of time. The size of the earthquake, distance to the fault that generated the earthquake, and the geology of the site determine the severity of ground shaking. Thick, loose materials tend to amplify and prolong the ground shaking during an event whereas dense materials such as bedrock tend to minimize the effects of ground shaking.

The characteristics of ground motion in alluvial areas will differ somewhat from nearby bedrock areas. These differences may be important when considering the design of sophisticated structures. Areas underlain by firm, dry alluvium are considered to possess a moderate damage susceptibility.

The alluvial materials located in valley bottoms, such as in the Salinas Valley, are more susceptible to prolonged and amplified ground shaking during a seismic event than the bedrock in the uplands. Primary damage from ground shaking during an earthquake consists of damage to structures as a result of repeated lateral

movement. Secondary damage to structures results from liquefaction and seismic compaction, land sliding and dam failure.

Liquefaction

Liquefaction is the transformation of soil from a solid to a liquid state due to increased pore-water pressure, usually in response to strong ground shaking. Liquefaction usually occurs in loose, saturated silts and sands. Structures supported on top of such soil during an earthquake can experience sudden differential settlement.

Subsidence, or dynamic compaction, is the densifying of loose, unconsolidated materials during an event and can cause similar damage to structures. Lateral spreading occurs when soils liquefy beneath a slope, but can also occur beneath level ground if an open topographic face is near.

Catastrophic ground failures may result from liquefaction that pose a major threat to the safety of structures. Major landslides, settling and tilting of buildings on level ground, and failure of water retaining structures have all been observed as a result of this type of ground failure. However, due

to the relatively level topography found throughout the Greenfield Planning Area, and the dense sands of gravel and cobble found beneath the alluvial deposits, the liquefaction potential of the soils in the Planning Area appear to be relatively low.

FLOOD HAZARDS

In accordance with the Federal Flood Insurance Administration flood hazard boundary maps, hazards related to flood inundation from natural drainage in the planning area do not apply to any areas within the City. The failure of either the Nacimiento or San Antonio Dams is considered to be a very low risk hazard. If failure did occur, through either seismic activity or war emergency, the City of Greenfield would be affected to only a small degree under most circumstances, excluding the coincidence of dam failure with a 100-year storm event. This is due mainly to the distance from the reservoirs and the opportunity for the largest volume of water to dissipate on the intervening lands before reaching the City of Greenfield. Travel time of peak flood is estimated to be 14 hours from San Antonio Dam and 15 hours from Nacimiento Reservoir.

FEMA Provisions & Disaster Relief

The Federal Emergency Management Agency (FEMA) conducts hazard mitigation through disaster-specific Programmatic Environmental Assessments (PEAs). Through the PEA for Typical Recurring Actions Resulting from Flood Disasters in California (1998), FEMA proposes to administer Federal disaster assistance pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 93-288, as amended (the Act), its implementing regulations in 44 Code of Federal Regulations (CFR) Part 206 (Federal Disaster Assistance) and the National Flood Insurance Reform Act of 1994 (PL 103-325).

FEMA must comply with the National Environmental Policy Act of 1969 (NEPA) prior to funding disaster assistance or mitigation actions (projects), for which NEPA usually requires an Environmental Assessment (EA). The PEAs allow typical recurring actions to be grouped and assessed by location or type of action, so that FEMA is not required to produce a separate EA for each project. FEMA administers three programs that fund such disaster assistance and mitigation projects:

Public Assistance Program (Act Section 406). This program is dedicated to the restoration of damaged facilities to pre-disaster conditions, and assists local governments and private non-profit organizations with the costs of disaster response and recovery;

Hazard Mitigation Grant Program (Act Section 404). This program provides cost-share funds to communities to reduce the long-term risk of disaster impacts;

Flood Mitigation Assistance Program (Title V of the National Insurance Reform Act of 1994). This program administers cost-share funding of community projects that can mitigate flood-related impacts.

Local utilization of FEMA program 1 would require either a flood, fire, or other disaster, but programs 2 and 3 may provide means by which flood impacts could be mitigated. Examples of such mitigation could include the expansion of detention structures or the construction of new flood control projects designed to reduce peak flows.

FIRE HAZARDS

Fire hazards threaten lives, property, and natural resources, and present a considerable problem to vegetation and wildlife habitats throughout the Planning Area. Grassland fires are easily ignited in

dry seasons. These fires are relatively easily controlled if they can be reached by fire equipment.

Wildland and Urban Fire Hazards

The California Department of Forestry and Fire Protection has classified fire hazard areas throughout Monterey County using a scale that classifies areas by the number of days of moderate, high, and very high fire hazard. The City of Greenfield is not classified by this scale and is considered a Local Responsibility Area and is served by the Greenfield Fire Protection District.

State Responsibility Areas (SRAs)

Pursuant to California Public Resources Code Section 4125 et seq., commonly known as the State Fire Responsibility Act, the State Board of Forestry classifies all lands within the State of California based on certain factors. Examples of these factors include cover, beneficial use of water from watersheds, probable damage from erosion, and fire risks and hazards. Next, the State Board of Forestry determines those areas for which the financial responsibility of preventing and suppressing fires is primarily the responsibility of the State of California. The prevention and suppression of fires in all areas that are not within a state responsibility area (SRA) becomes primarily the responsibility of the local or federal agencies, as applicable. Greenfield and the SOI Areas are not within a SRA and fire protection is the sole responsibility of the Greenfield Fire Protection District. See the Growth Management Element for a discussion of fire protection in the Planning Area.

HAZARDOUS MATERIALS AND WASTE

Solid, liquid, and hazardous materials and waste by area residents and businesses contribute to environmental and human health hazards that have become an increasing public concern. Toxicity and contamination of soils, water, air, and organisms present hazards of varying severity that can be controlled and minimized by proper waste management and disposal.

Title 22 of the California Code of Regulations (CCR) defines a hazardous material as follows:

... a substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed" (California Code of Regulations, Title 22, Section 66260.10).

Known Sources of Contamination

There are several known areas in the City where chemicals and other hazardous materials are located. Potential hazards include explosion and flammability of petroleum products and other chemicals, and chemical toxicity. Notwithstanding industrial safety procedures, the presence of large quantities of hazardous materials within the Planning Area and the County, particularly close to and/or upwind of populated areas, poses a potential safety hazard at all times.

Many miles of pipelines for the transportation of natural gas traverse the Planning Area, including residential and commercial areas. See **Figure 8-4 Hazardous Areas Locations**. The public safety hazard from a pipeline break would depend on the proximity of the accident to populated areas as well as the nature of the event that produced it. In general, natural gas is believed to be less hazardous to the public than petroleum because it is transported at lower pressures and, when released, rises and dissipates into the atmosphere.

Propane tanks are located at the Shell Station at the northern end of town and at Farm Agriculture located at Elm Avenue and 3rd Street. Additionally, there are several 52 gallon barrels of 12 percent liquid chlorine stored at the City's wells (13th Street and Oak Avenue and 14th Street between Walnut Avenue and Pine Street).

In addition to the hazardous materials noted above, agriculture presents the potential for exposure of sensitive land uses to hazardous chemicals. Activities such as application of fertilizers, pesticides and insecticides can present health and safety concerns. Applications of such chemicals are governed by various state and federal standards, and application of such chemicals is generally regulated by the County Agricultural Commissioner. The Land Use Policies of the Land Use Element seek to minimize this hazard by requiring setbacks, buffers and vegetation, as appropriate, to separate residential land uses from adjacent agricultural uses.

Risk of Upset

Gas storage facilities and the wastewater treatment plant have the potential of being significant safety hazards. Accidental explosions or spills can result in fires, noxious gases, bad odors, and pollution.

The following are areas of the City that have the potential to be safety hazards should a catastrophe of any kind occur.

Propane

As mentioned above, propane tanks are located at the Shell Station at the northern end of town and at Farm Agriculture located at Elm Avenue and 3rd Street. Propane is delivered to these sites by large tank trucks and is then distributed to users (primarily for small BBQ tanks). All propane is brought in or exported via truck, there are no propane lines extending throughout the City.

Compatibility of these facilities with future uses should be considered within the General Plan process.

Naturally Occurring Asbestos

Asbestos is the common name for a group of naturally occurring fibrous silicate minerals that can separate into thin but strong and durable fibers. Naturally occurring asbestos deposits are located in many parts of California and are commonly associated with serpentine rock. It is a known human carcinogen by State, Federal, and International agencies and was identified as a Toxic Air Contaminant by the California Air Resources Board in 1986.

Health Effects of Exposure to Asbestos

Asbestos fibers can cause health problems if inhaled. Many asbestos fibers deposited in the lung are retained there for long periods of time, others may be translocated to other parts of the body (e.g., the lining of the lung and abdomen), and others can be completely cleared slowly from the system. The fibers can cause chronic local inflammation and disrupt orderly cell division, both of which can facilitate the development of cancer and asbestosis, which is a non-cancerous lung disease

involving diffuse fibrotic scarring of the lungs. Thus, inhalation of asbestos fibers can initiate a chain of events resulting in cancer or other asbestos-related illness, which may not become apparent for years, even long after the exposure has ended.

For individuals living in areas of naturally occurring asbestos, there are many potential pathways for airborne exposure. Exposures to soil dust containing asbestos can occur under a variety of scenarios, including children playing in the soil, dust raised from unpaved roads and driveways covered with crushed serpentine, grading and construction associated with development of new housing, gardening and other human activities. For homes built on asbestos outcroppings, asbestos can be tracked into the home and can also enter as fibers suspended in outdoor air. Once such fibers are indoors, they can be re-suspended by normal household activities, such as vacuuming (as many fibers will simply pass through vacuum cleaner bags).

The general public exposed to low levels of asbestos may be at elevated risk (e.g., above background rates) of lung cancer and mesothelioma. The risk is proportional to the cumulative inhaled dose (number of fibers), and also increases with the time since first exposure. Although there are a number of factors that influence the disease-causing potency of any given asbestos, such as fiber length and width, fiber type, and fiber chemistry, all forms are carcinogens, and exposure should be minimized (State of California Office of Environmental Health Hazard Assessment 2004).

Air Sampling

The Monterey Bay Unified Air Pollution Control District performed air quality monitoring in King City during 2001 over a period of three phases from June to September. During Phase I (June 2 – 7,

2001) an average of five days of emission data resulted in a level of .0041 structures per cubic centimeter (cc) of air sampled. During Phase II (June 20 - 25, 2001), an average of five days of meter readings showed an emission of .0014 structures per cc. These samples were taken at seven different locations throughout the city limits. During Phase III, an average of five days of monitor readings throughout the City showed an average of .0007 samples per cc of air sampled. During Phase III, measurements were taken from San Lorenzo Park, San Antonio Park, King City Park, Forden Park, Monterey County Public Works Yard, and upwind of Del Rey Elementary School. Asbestos levels more than 0.0018 structures per cc of air are considered significant.

Soil Sampling

In response to the detection of low levels of asbestos in the ambient air quality, Monterey County Health Department, Division of Environmental Health conducted a soil investigation of the Salinas Valley to determine if the asbestos detected in King City was a local phenomenon or an area wide situation. A total of 37 sites were sampled for naturally occurring asbestos throughout the Salinas Valley with samples collected at the surface and at a depth of approximately six to eight inches. Approximately 74 samples were analyzed for asbestos. Asbestos levels in the samples ranged from no detection to 0.50 percent. Of the 37 sites that were sampled, ten sites were only positive for asbestos at the surface, three sites were positive for asbestos below the surface, and 14 sites were positive for asbestos at the surface and below the surface. Areas that were sampled near Greenfield include Elm Street, just west of the City and Oak Park. Additionally, throughout the Salinas valley the following areas were sampled: vacant lots, waterways (Arroyo Seco River, Salinas River, San

Lorenzo Creek), quarries, agricultural fields, city parks, wastewater treatment plant, asbestos mill, Public Works yard, and the Santa Lucia, Del Rey, and the San Lorenzo Schools in King City.

The Monterey County Health Department consulted with the State Department of Conservation and the Division of Mines and Geology and concluded that the wide spread low levels of asbestos detected in the soils within the Salinas Valley have been deposited over many years by flood waters draining known asbestos areas in the mountains approximately 30 miles to the east that contain serpentine outcroppings. Monterey County plans to continue testing in order to better understand the occurrence of naturally occurring asbestos levels in the Salinas Valley.

AIR QUALITY

The City of Greenfield is located in the North Central Coast Air Basin, which is regulated by the Monterey Bay Unified Air Pollution Control District (MBUAPCD).

Related Plans and Programs

A number of existing plans and programs relate directly to the goals of the Health and Safety Element. Enacted through federal, state, and local action, these plans and programs are administered by agencies with responsibility for their enforcement.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) was adopted by the state legislature in response to a public mandate for a thorough environmental analysis of projects that might adversely affect the environment. The provisions of the law, review procedure and any subsequent analysis are described in the CEQA Statutes and Guidelines.

Federal Clean Air Act

The Federal Clean Air Act established National Ambient Air Quality Standards (NAAQS) in 1970 for six pollutants: carbon monoxide, ozone, particulates, nitrogen dioxide, sulfur dioxide, and lead. The Act requires states with air pollution that exceeds the NAAQS to prepare air quality plans demonstrating how the standards would be met (State Implementation Plans-SIPs). In 1990, amendments to the Act established categories of severity for non-attainment areas (“marginal” to “extreme”). In 1994, the California Air Resources Board adopted a revised State Implementation Plan for ozone to meet the requirements of the 1990 amendments.

Monterey Bay Air Quality Management District

The Monterey Bay Unified Air Quality Management District (MBUAPCD) was created by the California Legislature as a regional agency responsible for regulating air quality. The District's jurisdiction encompasses three counties (Monterey, Santa Cruz, and San Benito Counties). The District is governed by an 11-member Board of Directors, which has the authority to develop and enforce regulations for the control of air pollution within its jurisdiction.

Air Quality in Greenfield

A semi-permanent high pressure in the eastern Pacific is the controlling factor in the climate of the North Coast Air Basin (NCCAB). In late spring and summer, the high-pressure system is dominant and causes persistent west and northwesterly winds over the entire California Coast. The onshore air currents pass over cool ocean waters to bring fog and relatively cool air into the coastal valleys. Warmer air aloft creates elevated inversions that restrict dilution of pollutants vertically, and

mountains forming the valleys restrict dilution horizontally.

In the fall, the surface winds become weak, and the marine layer grows shallow, dissipating altogether on some days. The airflow is occasionally reversed in a weak offshore movement, and the relatively stagnant conditions allow pollutants to accumulate over a period of days. During this season north or east winds develop that transport pollutants from either the San Francisco Bay Area or the Central Valley into the NCCAB.

During winter and early spring the high pressure system over the Pacific migrates southward and has less influence on the air basin. Wind direction is more variable, but northwest wind still dominates. The general absence of deep, persistent inversions and occasional storm passages usually result in good air quality for the basin as a whole.

The City of Greenfield is located more than 40 miles from the coast within the Salinas Valley, a steep-sloped coastal valley that opens out on to the Monterey Bay and extends southeastward. It is affected by sea breezes blowing from the northwest, but is less affected by the marine stratus that persists in the coastal plains of Monterey County. Persistent sea breezes ventilate the area; however its downwind location with respect to other metropolitan areas, warm temperatures and persistent sunshine create a moderate potential for photochemical air pollution.

Attainment Status and Regional Air Quality Plans

The MBUAPCD shares responsibility with the CARB for ensuring that the State and national ambient air quality standards are met within Santa Cruz, San Benito, and Monterey Counties and the North Central Coast Air Basin. State law assigns local air districts the primary responsibility for

control of air pollution from stationary sources while reserving to the CARB control of mobile sources. The District is responsible for developing regulations governing emissions of air pollution, permitting and inspecting stationary sources, monitoring air quality and air quality planning activities.

Under the Federal Clean Air Act the NCCAB is designated a maintenance area for the federal 1-hour ozone standard. The NCCAB was re-designated from a moderate non-attainment area to a maintenance area in 1997 after meeting the federal 1-hour standard in 1990. The NCCAB is designated as an attainment area for the federal 8-hour ozone standard.

Under the California Clean Air Act (CCAA), the basin is a moderate non-attainment area for the State 1-hour ozone standard. The air basin is also designated non-attainment for the state PM₁₀ standard.

Sensitive Receptors

MBUAPCD defines sensitive receptors as a location where human populations, especially children, seniors, and sick persons, are located where there is reasonable expectation of continuous human exposure according to the averaging time for an air quality standard (e.g., 24-hour, 8-hour, 1-hour). These typically include residences, hospitals, and schools.

Pollutant Sources

The Monterey Bay Unified Air Pollution Control District (MBUAPCD) operates a network of monitoring sites throughout the District. Monitoring sites in Monterey County are located at Monterey, Carmel Valley, Salinas, Moss Landing and King City. The King City monitoring site is the closest to the City of Greenfield. Pollutants measured at the King City site are ozone and PM₁₀.

During the 5-year period 1996-2000 no violations of the federal or state ambient air quality standards for ozone were recorded at the King City monitoring site. The federal PM₁₀ standard was met during this period, but records indicate the more stringent state standard for PM₁₀ was exceeded twice during this period. During that same period violations of the state standards for ozone and PM₁₀ were recorded elsewhere within the MBUAPCD in Santa Cruz and San Benito Counties.

As required by the CCAA, the District adopted the 1991 Air Quality Management Plan (AQMP). The AQMP addressed attainment of the State ambient air quality standard for ozone. In 1994, 1997, 2000, and 2004, the District adopted updates to the AQMP. The *2004 Air Quality Management Plan for the Monterey Bay Region* is the current regional air quality plan. The goal of the Plan is to improve air quality through tighter industry controls, cleaner cars and trucks, cleaner fuels, and increased commute alternatives. Adopted Transportation Control Measures (TCMs) are:

- Improved Public Transit
- Area Wide Transportation Demand Management
- Signal Synchronization
- New and Improved Bicycle Facilities
- Alternate Fuels
- Park and Ride Lots
- Livable Communities
- Selected Intelligent Transportation Systems
- Traffic Calming

PUBLIC PROTECTION AND DISASTER PLANNING

Hospitals, ambulance companies, and fire districts provide medical emergency services. Considerable thought and planning have gone into efforts to improve responses to day-to-day emergencies and planning for a general disaster response capability.

Identification of streets, house numbers, and townhouse and apartment units is a major factor hampering emergency medical response. Design of multi-story buildings rarely includes elevators or stairways that can accommodate gurneys. In the event of a disaster, many people could be affected.

Generally, disaster planning is conducted at a countywide, multi-county, or regional level, with comprehensive programs established to protect persons from natural or human-caused disasters. Monterey County, through the Safety Element of the County General Plan (1982), has identified various hazards and has designed appropriate programs to address disaster planning and public protection. The programs for public relief and safety are generated at this countywide level, in combination with State and Federal agencies and the updated Greenfield Emergency Response and Evacuation Plan, will accommodate the City of Greenfield should a significant natural or human-caused disaster occur.

REFERENCES

Monterey Bay Unified Air Pollution Control District, Public Presentation on King City Asbestos Investigation Results, January 2002.

8.0 – HEALTH AND SAFETY ELEMENT

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