Annex to 2010 Association of Bay Area Governments Local Hazard Mitigation Plan

Taming Natural Disasters

City of Half Moon Bay

City Hall
501 Main Street
Half Moon Bay, CA 94019

Table of Contents

Introduction

The City of Half Moon Bay is a small city in San Mateo County, California. It was incorporated as a General Law City in 1959. It provides general administration, planning, engineering and public works services, a wastewater treatment plant, police department, and parks and recreations services to a population of approximately 13,371. The City is 6.3 square miles in area and is approximately 7 miles long and a little less than a mile wide. It is located on the Pacific Cost 25 miles south of San Francisco. The City's adopted budget for Fiscal Year 2010-11 provides for 31.8 employees. Fire Services are proved by the San Mateo County Coastside Fire District. Sewer and Water services are also supplied by separate districts. A map of the City's jurisdictional boundary is provided in Exhibit A.

The Regional Planning Process

The City of Half Moon Bay participated in various ABAG workshops and meetings, including:

- ABAG Building Officials Workshop July 21, 2009
- ABAG Strategies Workshop December 15, 2009

For more information on these meetings and for rosters of attendees, please see Appendix A and H in the ABAG Multi-Jurisdictional Local Hazard Mitigation Plan 2010 (MJ-LHMP). In addition, the City of Half Moon Bay has provided written and oral comments on the multi-jurisdictional plan and provided information on facilities that are defined as "critical" to ABAG.

The Local Planning Process

Representatives from multiple City departments met on a regular basis to identify and prioritize appropriate mitigation strategies. Personnel involved in these meetings included senior management and staff from the police department, planning and engineering, and public works. Cal Fire and the District Coordinator representing the San Mateo County Office of Emergency Services also participated in the preparation of this plan. Each person was responsible for communicating existing efforts and thoughts on appropriate future action in their area of expertise.

Representatives from Public Works, Planning and Engineering provided invaluable insight on the City's ability to provide emergency services in the face of a disaster. Issues involving transportation, facilities, traffic, drainage systems, flooding and sewer systems were discussed.

At the first meeting, general priorities and appropriate departments were identified. Subsequent meetings identified mitigation strategies, prioritized said strategies, and reviewed preliminary budgets and potential funding sources for strategies designated as "High" priority for City-owned-and-operated facilities.

Process for Updating Plan Sections

Planning Process – City staff began the update process by reviewing the 2005 Plan. Staff then researched City records in order to provide new information on hazards and susceptibility within the city. The updates also incorporated the new ABAG data on hazard susceptibility and the 2010 planning process. The City included any additional occurrences of natural hazards since the last plan and updated the risk assessment with new data from ABAG.

Plan Maintenance Process – The planning team decided that a major update was not necessary because most of the information was still accurate and up to date. Only minor changes were made to this section. City staff determined that this approach applied locally as well.

Hazard and Risk Assessment – ABAG updated the hazard maps used in the original LHMP based on the input of the local regional agencies. Maps that were updated include:

- Liquefaction susceptibility
- Tsunami evacuation planning
- FEMA flood hazard areas
- Fire Threat
- Sea level rise (new map for LHMP)

This information was incorporated in the Half Moon Bay 2011 Annex and will be used to update the Safety Element of the City's General Plan.

Mitigation Strategies – Mitigation strategies and regional mitigation priorities were updated with input from the entire planning team. All mitigation strategies and regional mitigation priorities relevant to the City of Half Moon Bay were incorporated into HMB Annex 2011.

Review of Existing Programs, Policies, and Technical Documents

There were a variety of reports, documents and plans specific to Half Moon Bay that were reviewed in preparation of this plan. These documents were not included in the ABAG Plan (http://quake.abag.ca.gov/wp-content/documents/ThePlan-A-2010.pdfpage12). Documents specific to the City of Half Moon Bay included:

General Plan Safety Element	Hazard Assessment/Mitigation Strategies
Local Coastal Program Chapter f	Hazard Assessment/Mitigation Strategies
Master Traffic Resolution	Mitigation Strategies
Highway 1 Traffic Safety and Congestion Mitigation Plan – 2009	Mitigation Strategies
Traffic Impact Study for Coastside Senior Adult Center (925 Main Street) – 2010	Mitigation Strategies
Traffic Study for Yep Subdivision (940 Main Street) – 2008	Mitigation Strategies
Traffic Impact Study for Cabrillo Corners (South-east corner of Highway 1/92) – 2008	Mitigation Strategies
Highway 1/Terrace Avenue Signalization and	Mitigation Strategies

Roadway Improvement Study – 2006	
Traffic Study for Kelly/Main Street mixed-use development – January 2006	Mitigation Strategies
Caltrans Bridge Inspection Records Information System reports	Mitigation Strategies

Public Meetings

Opportunity for public comments on the DRAFT mitigation strategies was provided at a publicly televised meeting on April 20, 2010. The draft mitigation strategies were also published on the City of Half Moon Bay's website for public viewing and comment. No public comments were received from either the meeting or the internet posting. Copies of the April 20, 2010, staff report and website posting are attached under Exhibit B. The City will consider alternate methods of reaching the public that will be more effective in achieving public participation. It is suggested that future updates include public announcements at two separate regularly scheduled City Council meetings, and announce the City's desire to seek input in the local newspaper and on the City's website.

The City Council will adopt the plan in a public meeting via an official Resolution upon approval by FEMA. The mitigation strategies will become an implementation appendix of the Safety Element of the City of Half Moon Bay's General Plan.

Hazards Assessment

The ABAG Multi-Jurisdictional Local Hazard Mitigation Plan, to which this is an annex, lists nine hazards that impact the Bay Area, five related to earthquakes (faulting, shaking, earthquake-induced landslides, liquefaction, and tsunamis) and four related to weather (flooding, landslides, wildfires, and drought). Maps of these hazards and risks are shown on the ABAG website at http://quake.abag.ca.gov/mitigation/.

The City of Half Moon Bay ranked the hazards based on a review of the General Plan Safety Element, Chapter 4 Hazards of the Local Coastal Program and the knowledge and expertise of the City's team.

The City's team discussed the potential hazards and concluded that flooding (due to Tsunami), wildfire, and landslides pose a risk for potential loss. The threat of Tsunami exists in many coastal communities. Less than 20% of the City of Half Moon Bay's population and only one City-owned bridge are located within the Inundation Zone. There are no other critical facilities within the Inundation Zone. Large bluffs along the City's shoreline (over 30' in most areas) provide protection mitigating the threat of Tsunami.

Local Coastal Program policies are applied at the time a development proposal is submitted for approval. The Planning Department reviews proposals for compliance with LCP policies and recommends the appropriate action to approve, approve with conditions or deny the proposed

development with input from City Engineering, Public Works, and Police Departments, and the Fire District.

There are no known active faults in the City of Half Moon Bay. While surface faults are not present, earthquake hazard could cause dam failure upstream that would result in flooding Pilarcitos Creek. The City of Half Moon Bay is close to the San Andreas Fault. In an earthquake, there is potential for major ground shaking.

The City of Half Moon Bay does not face any natural disasters not listed in the ABAG multi-jurisdictional plan and no new hazards have been identified by the City of Half Moon Bay since the original development of this plan in 2005.

While the City of Half Moon Bay has undertaken a number of general hazard mapping activities since the first Safety Element was prepared by the City of Half Moon Bay, all of these maps are less detailed and are not as current as those shown on the ABAG website at **http://quake.abag.ca.gov/mitigation/**.

Past Occurrences of Disasters (natural and human-induced)

The City of Half Moon Bay has experienced a number of different disasters over the last 50 years, including earthquakes, floods, droughts, energy shortages, landslides, and severe storms.

More information on State and Federally declared disasters can be found at http://quake.abag.ca.gov/mitigation/ThePlan-D-Version-December09.pdf

Locally significant incidents that have impacted San Mateo County in the last several years include:

- 1984 – Flooding due to a severe storm damaged the seawall at Mirada Road and Pilarcitos Creek Trail.

- April 2006 – Devil's Slide, State Route 1 was shut down for over five months due to erosion. State Route 1 is the primary coastside roadway linking the northern and southern parts of San Mateo County. The closure resulted in the rerouting of vehicular traffic for the period of closure. State, County, and local agencies were impacted by this event.

- November 2009 – Mehserle Shooting/sentencing. Civil Disturbance. City of Oakland activated their EOC. Per mutual aid agreements, San Mateo County law enforcement agencies provided assistance.

- February 27, 2010 – Chile Earthquake/Tsunami. State EOC activated. San Mateo County EOC monitored situation.

- September 9, 2010 – San Bruno/Glenview Fire. A Pacific Gas and Electric gas line exploded in a residential neighborhood causing multiple deaths and the destruction of many homes. The Acting Governor of the State of California declared a State of Emergency. Hundreds of personnel representing local, county, and state entities responded per mutual aid agreements/protocols.

Risk Assessment

Urban Land Exposure

The City of Half Moon Bay examined the hazard exposure of City of Half Moon Bay urban land based on information in ABAG's website at **http://quake.abag.ca.gov/mitigation/pickdbh2.html**. The "*2005 Existing Land Use with 2009 Mapping*" file was used for this evaluation (in the existing plan, the file used was "*Existing Land Use in 2000*").

Potential risks in the City of Half Moon Bay differ from many other cities in the Bay Area. Land use is less dense and there are no rail or transit systems. Situated on the coast, the City is exposed to coastal issues including the threat of Tsunami and erosion.

Whether it is a natural or manmade disaster, one of the most significant potential issues effecting Half Moon Bay is isolation. There are only two roadways providing egress and ingress (SR 92 and Hwy 1). Traffic collisions and erosion problems frequently result in the temporary closure of these two-lane roadways. A significant event could close both highways for a sustained period essentially isolating the City from outside emergency help.

In general, the hazard exposure of the City of Half Moon Bay has remained unchanged over the past five years. There has been no change in the acres of urban land in the 100 year flood zone over 5 years. This is partly due to the fact that FEMA digital flood insurance rate maps have not been updated for San Mateo County since the last LHMP. Table 1 describes the exposure of urban land within the City of Half Moon Bay to the various hazards:

Table 1: Exposure (acres of urban land)			
Hazard	**Plan Year 2005**	**Plan Year 2010**	**Change**
Total Acres of Urban Land	2,378	2,378	0
Earthquake Faulting (within CGS zone)	0	0	0
Earthquake Shaking (within highest two shaking categories)	2,019	2,003	(16)
Earthquake-Induced Landslides (within CGS study zone)	0	0	0
Liquefaction (within moderate, high, or very high liquefaction susceptibility	1,342	1,226	(116)
Flooding[1] (within 100 year floodplain)	2	13	11
Flooding (within 500 year floodplain)	8	6	(2)
Landslides (within areas of existing landslides)	61	61	0
Wildfire (subject to high, very high, or extreme wildfire threat)[2]	123	92	(31)
Wildland-Urban Interface Fire Threat	1,773	1,815	42
Dam Inundation (within inundation zone)	168	176	8
Sea Level Rise[3]	not applicable		
Tsunamis[4] (within inundation area)	not applicable		
Drought[5]	-	-	-

[1] New digital FEMA mapping provides more accurate accounting of properties with structures in the floodplain.
[2] The decrease is due to better and more accurate mapping.
[3] The sea level rise map is not a hazard map. It is not appropriate to assess infrastructure exposure to sea level rise.
[4] Tsunami evacuation planning maps were not available inside the San Francisco Bay in 2005. This map became available in December 2009. Acres of exposed land are not an appropriate analysis for this hazard. It should be noted that this map is not a hazard map and should be used for evacuation planning purposes only. The inundation line represents the highest inundation at any particular location from a suite of tsunami sources. It is not representative of any single tsunami.
[5] The entire area of the City of Half Moon Bay is subject to drought.

Infrastructure Exposure

The City of Half Moon Bay also examined the hazard exposure of infrastructure within the jurisdiction based on the information on ABAG's website at **http://quake.abag.ca.gov/mitigation/pickdbh2.html**. Of the 57 miles of roadway in the City of Half Moon Bay, Table 2 identifies roadway exposure to the various hazards analyzed:

Table 2: Exposure (miles of infrastructure)						
Hazard	**Roadway**		**Transit**		**Rail**	
	Plan Year 2005	**Plan Year 2010**	**Plan Year 2005**	**Plan Year 2010**	**Plan Year 2005**	**Plan Year 2010**
Total Miles of Infrastructure	57	57	0	0	0	0
Earthquake Shaking (within highest two shaking categories)	56	55	0	0	0	0
Liquefaction Susceptibility (within moderate, high, or very high liquefaction susceptibility	34	33	0	0	0	0
Liquefaction Hazard (within CGS study zone)[1]	0	0	0	0	0	0
Earthquake-Induced Landslides (within CGS study zone)[2]	0	0	0	0	0	0
Earthquake Faulting (within CGS zone)	0	0	0	0	0	0
Flooding (within 100 year floodplain)	0	0	0	0	0	0
Flooding (within 500 year floodplain)	0	0	0	0	0	0
Landslides (within areas of existing landslides)	3	3	0	0	0	0
Wildfires (subject to high, very high, or extreme wildfire threat)	3	2	0	0	0	0
Wildland-Urban Interface Fire Threat	47	49	0	0	0	0
Dam Inundation (within inundation zone)	4	4	0	0	0	0
Sea Level Rise[3]	not applicable					
Tsunamis[4]	not applicable					
Drought[5]	not applicable					

[1] The California Geological Survey has not yet mapped the coastal areas of San Mateo County.
[2] The California Geological Survey has not yet mapped the coastal area of San Mateo County.
[3] The sea level rise map is not a hazard map. It is not appropriate to assess infrastructure exposure to sea level rise.
[4] Tsunami evacuation planning maps were not available inside the San Francisco Bay in 2005. This map became available in December 2009. Miles of exposed infrastructure is not an appropriate analysis for this hazard. It should be noted that this map is not a hazard map and should be used for evacuation planning purposes only. The inundation line represents the highest inundation at any particular location from a suite of tsunami sources. It is not representative of any single tsunami.
[5] Drought is not a hazard for roadways.

Exposure of City of Half Moon Bay-Owned Critical Facilities, Bridges and Interchanges, Plus Critical Healthcare Facilities and Schools

The City of Half Moon Bay examined the hazard exposure of critical health care facilities and schools located within the City of Half Moon Bay, based on the information on ABAG's website at **http://quake.abag.ca.gov/mitigation/pickcrit2010.html**. The City of Half Moon Bay provided a list of the critical facilities it owns to ABAG. ABAG provided a detailed assessment of the hazard exposure of each of its facilities. Table 3 identifies the number of facilities is exposed to the various hazards analyzed:

Table 3: Exposure (number of facility types)

Hazard	Hospitals		Schools		Locally owned critical facilities		Locally owned bridges and interchanges	
	Plan Year 2005	Plan Year 2010	Plan Year 2005	Plan Year 2010	Plan Year 2005	Plan Year 2010	Plan Year 2005	Plan Year 2010
Total Number of Facilities[1]	0	0	3	8	12	12	3	1
Earthquake Shaking (within highest two shaking categories)	0	0	3	8	12	9	3	1
Liquefaction Susceptibility (within moderate, high, or very high liquefaction susceptibility	0	0	2	7	11	8	3	1
Liquefaction Hazard (within CGS study zone)	0	0	0	0	0	0	0	0
Earthquake-Induced Landslides (within CGS study zone)[2]	0	0	0	0	0	0	0	0
Earthquake Faulting (within CGS zone)	0	0	0	0	0	0	0	0
Flooding (within 100 year floodplain)	0	0	0	0	0	0	0	0
Flooding (within 500 year floodplain)	0	0	0	0	0	0	0	0
Landslides (within areas of existing landslides)	0	0	3	8	12	9	3	1
Wildfires (subject to high, very high, or extreme wildfire threat)	0	0	0	0	1	0	1	0

Wildland-Urban Interface Fire Threat	0	0	3	7	11	9	2	1
Dam Inundation	0	0	0	0	0	0	1	0
Sea Level Rise (exposed to 16in sea level rise)[3]	-	0	-	0	-	0	-	0
Sea Level Rise (exposed to 55in sea level rise)[4]	-	0	-	0	-	0	-	0
Tsunamis[5] (within inundation area)	-	-	-	-	-	-	-	-
Drought[6]	-	-	-	-	-	-	-	-

[1] Plan year 2005 did not include continuation schools or "other" category for number of schools.
[2]The California Geological Survey has not yet completely mapped the San Francisco Bay Area.
[3] Sea level rise data was not available in 2005
[4] Sea level rise data was not available in 2005
[5] It should be noted that this map is not a hazard map and should be used for evacuation planning purposes only. The inundation line represents the highest inundation at any particular location from a suite of tsunami sources. It is not representative of any single tsunami.
[6] Drought will not affect locally owned facilities directly.

Repetitive Loss Properties

There are no repetitive loss properties in the City of Half Moon Bay. This is based on a review of the relevant chart found at **http://quake.abag.ca.gov/mitigation/pickflood.html**.

Other risks

The City of Half Moon Bay plans to continue to work with ABAG to improve the risk assessment information being compiled by ABAG, including:

- Developing ways to assess how many soft-story buildings are located in the City. This is addressed in On-going Mitigation Strategies: Conduct an inventory of privately owned existing or suspected soft-story residential, commercial and industrial structures as a first step in establishing voluntary or mandatory programs for retrofitting these buildings (HSNG-c-4, ECON-b-4).
- Developing specific information about the kind and level of damage to buildings, infrastructure, and critical facilities which might result from any of the hazards previously noted.

National Flood Insurance Program

The City of Half Moon Bay has participated in the National Flood Insurance Program since 1986. The City has a floodplain management program regulated by local ordinance adopted in 2002. The City has a Tsunami Evacuation Plan. The City of Half Moon Bay does not participate in the Community Rating System.

Mitigation Goals and Objectives

The goal of the ABAG MJ-LHMP is to maintain and enhance a disaster-resistant region by reducing the potential for loss of life, property damage, and environmental degradation from natural disasters, while accelerating economic recovery when they occur. This goal is unchanged from the 2005 plan and continues to be the goal of the City of Half Moon Bay in designing its mitigation program.

Additionally, the City has the specific objective of reducing the number of public and private buildings within the City that are vulnerable to the effects of earthquakes, flood and wildfire.

Mitigation Activities and Priorities

Evaluation of Progress from 2005 Plan

In 2005, mitigation actions and priorities were identified. The following list reflects several of the strategies identified, along with responsible party and action taken.

Government b-14, b-15: During 2005, the City of Half Moon Bay worked closely with the County Office of Emergency Services to install two tsunami sirens within the City Limits. This also included updating the City's tsunami evacuation plan and organizing the various governmental and non-governmental agencies on the coast side to enhance Half Moon Bay's collective response to a tsunami incident. The City also held two tsunami tabletop exercises which were facilitated by the County Office of Emergency Services, City Staff, allied agencies, the business community, and the public.

Government b-22: During 2008, the City established an emergency telephone notification system (Rapid Notify) to increase communication with the public and other city staff during emergency and non-emergency situations.

Government b-17: The City of Half Moon Bay partnered with NOAA (weather service) to obtain tsunami ready certification. To obtain certification, the City passed an audit of its emergency planning, response, and notification capabilities. Two public forums were held on tsunami and emergency preparedness, which included distributing literature on the inundation zones and safe exit routes. The City also received Storm Ready Certification which deals with the impacts of foul weather on creeks, streams, roadways, and public safety. The City also co-sponsored CERT training along with the Coastside Fire District for residents and City Staff.

Education b-3: The Cabrillo Unified School District now includes information about service as disaster service workers in the employee compliance packet that is reviewed and signed off by every employee in the district.

Education c-1: Every school site now has an identified safety committee supported by a district manual that is reviewed and updated annually. The district now issues safety and health alerts in both English and Spanish.

Education c-2: Fire drills and related traffic flows and access issues are now addressed routinely and practiced at all school sites. The district now uses an operational two-way radio system that connects all of school sites to be used in the event of a fire or other natural disaster.

Future Mitigation Actions and Priorities

As a participant in the 2010 ABAG multi-jurisdictional planning process, the City of Half Moon Bay helped in the development and review of the comprehensive list of mitigation strategies in the overall multi-jurisdictional plan. The decision on priority was made based on a variety of criteria, not simply on an economic cost-benefit analysis. These criteria include being technically and administratively feasible, politically acceptable, socially appropriate, legal, economically sound, and not harmful to the environment or our heritage. Representatives from multiple departments then met on a regular basis to review progress on the City of Half Moon Bay's 2007 strategies, to identify and prioritize additional mitigation strategies to update the list. See Appendix C.

These draft priorities were submitted to key management staff for review. The draft priorities were presented to the Half Moon Bay City Council on April 20, 2010, and will provided for adoption pending approval of this LHMP by FEMA.

The City planning team also prioritized several specific mitigation tasks for the next 5 years. Identification of the Future Priorities resulted from discussions with the City Engineer, former Police Chief and Planning Director. This list includes implementation process, funding strategy, responsible agency, and approximate time frame.

Future Priority #1

- The City of Half Moon Bay has been awarded a $750,000 Federal Department of Homeland Security sub-grant for the construction of a new Emergency Operations Center. There is a City Match of $250,000. The project is currently under review by CalEMA and FEMA. It is anticipated that construction will begin in 2011. Part of the development includes a secure fiber optics communications link between City Hall, the EOC and other County agencies. The City Manager, Police and Public Works Department's are responsible for this project. GOVT 2005 b-5 (a), b-8, b-10; GOVT 2009/10 c-4, c-8, c-10.

Future Priority #2

- The Safety Element of the City's General Plan was adopted in 1991 and has not been updated since. The policies contained in this Element recommend reliance on maps

prepared by the Federal Flood Insurance Administration (FEMA) and San Mateo County Office of Emergency Services (OES). Table B of this Element indicates that Pilarcitos Dam, located upstream from the City and owned by the San Francisco Water Department (PUC), has a holding capacity of 3,100 acre-feet. Failure of this dam has the potential to endanger lives and property. This will require the following elements:

- Reaffirm FEMA determination that Pilarcitos and Frenchman's Creeks are not subject to 100-year and 500-year flood events.
- Amend Chapter 4 (Hazards) of the Local Coastal Program
- Update City Hazards Mapping contained in the LCP
- Update the Safety Element of the City's General Plan

Chapter 4 of the City's Local Coastal Program addresses Hazards, including flood inundation due to tsunami and upstream dam failure. The LCP, which was last updated in 1993, indicates they rescinded the flood hazard boundary in the City of Half Moon Bay having determined that there is no substantial danger of a 100-year or a 500-year flood in any part of the City.

The City of Half Moon Bay Planning and Engineering Departments are responsible for this priority. Potential funding sources include State and/or federal grants.

The benefit of identifying areas inundated by tsunami and/or catastrophic dam failure preventing loss of life and property far outweighs the cost of preparing the necessary documents. This priority has a projected timeline of completion within five years. GOVT c-21 through c-24.

Future Priority #3

- Replace the Main Street Bridge over Pilarcitos Creek. The Main Street Bridge was constructed around 1900, and is one of the two vehicular bridges across Pilarcitos Creek; a wide perennial major waterway in Half Moon Bay. The bridge has a low structural sufficiency rating and is eligible for replacement with Federal Highway Funds administered through Caltrans. The City has requested authorization to proceed with the environmental and cultural resources studies and preliminary design needed for the bridge replacement. This work should be completed by March 2012, subject to Caltrans approval. The bridge replacement is planned in stages over two construction seasons to minimize impacts on the aquatic habitat, emergency services and the Downtown businesses. The new bridge will provide more reliable trunk main crossings for water distribution, gas distribution, sewer collection and other utilities. The bridge replacement is essential for transportation and circulation needs of the City and its surrounding areas. The existing bridge is susceptible to damage during a major earthquake, tsunami and upstream dam failure.

The benefit of the bridge replacement far outweighs the potential loss of life and cost of property and economic loss to the community in a calamity. Federal and State Grants will be used to fund this project. This priority has a projected timeline of completion within five years. GOVT c-21 through c-24, INFRA a-4, a-5.

Future Priority #4

- Seek funding for retrofit and widening of the State Route 1 Bridge over Frenchman's Creek. The State Route 1 Bridge over Frenchman's Creek is the only crossing over a major perennial waterway in Half Moon Bay. The box culvert bridge was built in early 1970's by Caltrans. It carries Highway 1 over a deep and wide creek. Highway 1 has only one lane in each direction of travel at this location. Vehicles stopped by a nearby signalized intersection form long queues extending up to a quarter mile in each direction. The Highway 1 Traffic Safety and Congestion Mitigation Plan, adopted by the City Council of Half Moon Bay in 2009, recommends adding second through lanes and a left/right turn lane in each direction of travel to mitigate congestion and improve emergency service delivery. These improvements are essential for safe escape and service delivery to the City and its surrounding communities during a calamity or emergency.

  San Mateo County voter approved sales Tax Measure A can provide a portion of the funds needed for Highway 1 congestion mitigation in and around Half Moon Bay. The San Mateo County Transportation Authority and the City of Half Moon Bay will seek additional needed funds from the State or Federal Highway programs.

  Caltrans and San Mateo County Transportation Authority are responsible for this project. Potential funding sources include State and/or Federal grants. The benefit of the bridge retrofit and widening far outweighs the potential loss of life and cost of property and economic loss to the community in a calamity. This priority has a projected timeline of completion within five years. INFRA a-5.

On-Going Mitigation Strategy Programs

The City of Half Moon Bay has many on-going mitigation programs that help create a more disaster-resistant region. The following list highlights those programs identified as *Existing Programs* in the mitigation strategy spreadsheet. Others are on-going programs that are currently underfunded. It is the City's priority to find additional funding to sustain these on-going programs over time.

- Vulnerability assessments of City's facilities and infrastructure (GOVT-a-1)
- Non-structural mitigation for building contents (GOVT-a-4);

- Installation of micro and/or surveillance cameras at critical public assets tied to web-based software (GOVT-a-6);
- Continue to participate in developing and maintaining communications for first responders from cities, counties, special districts, state, and federal agencies. (GOVT-c-7);
- Maintain and participate in the San Mateo County's Standardized Emergency Management System Plan (GOVT-c-12);
- Participation in general mutual-aid agreements and agreements with adjoining jurisdictions for cooperative response to fires, floods, earthquakes, and other disasters (GOVT-c-13);
- Participation in FEMA's National Flood Insurance Program (GOVT-d-5)
- Develop printed materials, utilize existing materials (such as developed by FEMA and the American Red Cross, and others including non-profit organizations), conduct workshops, and/or provide outreach encouraging employees of these critical health care facilities to have family disaster plans and conduct mitigation activities in their own homes (HEAL-a-7);
- Sponsor the formation and training of Community Emergency Response Teams (CERT) through partnerships with local businesses (GOVT-c-3, ECON-j-5, HWNG-k-6);
- Incorporate FEMA guidelines and suggested activities into local government plans and procedures for managing flood hazards (LAND-c-2);
- Increase efforts to reduce landslides and erosion in existing and future private development through continuing education of design professionals on mitigation strategies (HSNG-i-2, ECON-g-2);
- Conduct an inventory of privately owned existing or suspected soft-story residential, commercial and industrial structures as a first step in establishing voluntary or mandatory programs for retrofitting these buildings (HSNG-c-4, ECON-b-4);
- Continue to repair and make structural improvements to storm drains, pipelines, and/or channels to enable them to perform to their design capacity in handling water flows as part of regular maintenance activities (INFR-d-6, INFR-d-7). This strategy has the secondary benefit of addressing fuel, chemical, and cleaning fluid issues.

Incorporation into Existing Planning Mechanisms

The City of Half Moon Bay has several planning mechanisms including the following:

- General Plan Safety Element
- Capital Improvements Plan
- Chapter 4 of the City's certified Local Coastal Program (LCP) identifies Coastal Act policies, local planning issues and policies that address hazard areas within the City. A copy of the LCP can be found in Exhibit D.

The City updates its General Plan periodically with minor updates occurring more frequently. The next revision of the General Plan will include language and modifications from the Annex designed to ensure coordination between the plans.

The City of Half Moon Bay has a Safety Element in its General Plan that includes a discussion of fire, earthquake, flooding, and landslide hazards. This plan was adopted as an implementation appendix to the Safety Element. In addition, the City enforces the requirements of the California Environmental Quality Act (CEQA), which, since 1988, requires mitigation for identified natural hazards. The City has used these pre-existing programs as a basis for identifying gaps that may lead to disaster vulnerabilities in order to work on ways to address these risks through mitigation.

The City of Half Moon Bay is in the process of updating its General Plan. When feasible, findings in the Annex will be incorporated into the updated parts of the Safety Element. This will lead to more consistency than simply adopting this Annex as an appendix to the Safety Element of the General Plan.

Plan Update Process

As required by the Disaster Mitigation Act of 2000, the City of Half Moon Bay will update this plan annex at least once every five years, by participating in a multi-agency effort with ABAG and other agencies to develop a multi-jurisdictional plan.

The City Manager will ensure that the plan is monitored. The Annex will be a discussion item on the agenda of the meeting of Executive Team at least once a year in April. At that meeting, the department heads will focus on evaluating the Annex in light of technological and political changes during the past year or other significant events. The Executive Team will be responsible for determining if the plan should be updated. However, major disasters affecting the City, legal changes, notices from ABAG as the lead agency in this process, and other triggers will be used.

The City of half Moon Bay will contact ABAG four years after this plan is approved to ensure that ABAG plans to undertake the plan update process. If so, the City of Half Moon Bay again plans to participate in the multi-jurisdictional plan. If ABAG is unwilling or unable to act as the lead agency in the multi-jurisdictional effort, other agencies will be contacted, including the San Mateo County Sheriff's Office, Office of Emergency Services. The County of San Mateo and incorporated cities within the County should then work together to identify another regional forum for developing a multi-jurisdictional plan.

The public will continue to be involved whenever the plan is updated and as appropriate during the monitoring and evaluation process. Prior to adoption of updates, the City of Half Moon Bay will provide the opportunity for the public to comment on the updates. A public notice will be posted prior to the meeting to announce the comment period and meeting logistics. As indicated earlier, the City will consider alternative methods designed to encourage public input.

Mitigation Plan Point of Contact

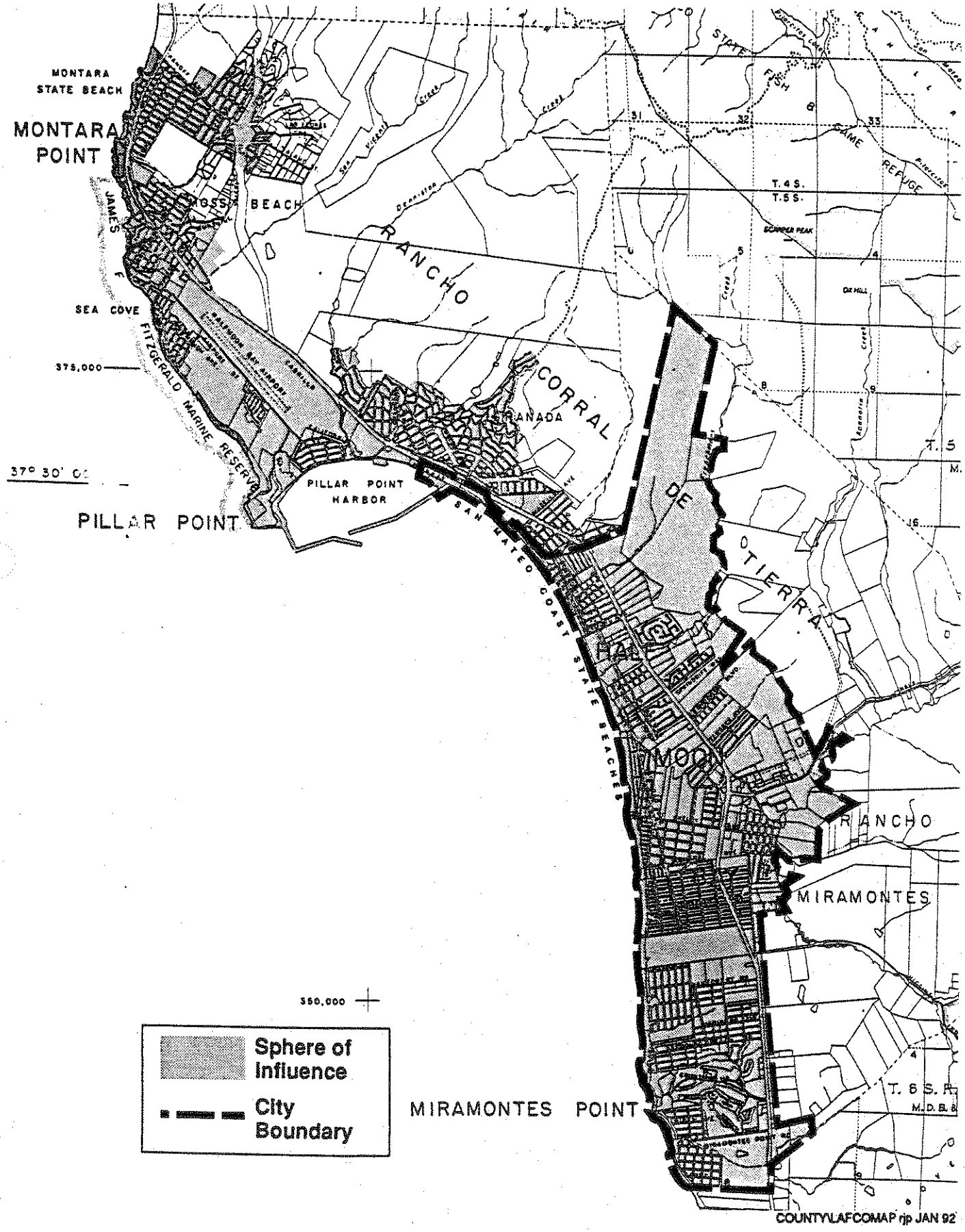
Name: Lee G. Violett
Title: Interim Chief of Police
Mailing Address: 537 Kelly Avenue, Half Moon Bay, CA 94019
Telephone: 650-726-8791
Email: lviolett@hmbcity.com

Alternate Point of Contact
Name: Laura Snideman
Title: Administrative Officer
Mailing Address: City Hall 501 Main Street, Half Moon Bay, CA 94019
Telephone: 650-726-8918
Email: lsnideman@hmbcity.com

Exhibit A – Jurisdiction Boundary Map

City of Half Moon Bay

Municipal Government



COUNTY\LAFCO\MAP rjp JAN 92

Exhibit B - Public Meeting Announcements

MINUTES

REGULAR AND SPECIAL MEETING OF THE HALF MOON BAY CITY COUNCIL

April 20, 2010

CONVENE SPECIAL MEETING:
The Special Meeting was convened at 5:05 p.m. at the Adcock Community/Senior Center with Councilmembers Alifano, Muller, Patridge & Mayor Fraser present.

Councilmember Kowalczyk arrived at 5:12 p.m.

Recess to Closed Session:

- **Pursuant to Government Code Section 54957.6 - Conference with City Designated Negotiators for the Following Employees and Employee Organizations:** Represented Management Team, Police Management, Police Officers Association, International Union of Operating Engineers Stationary Local 39, Unrepresented Employees: Executive Employees and Contract Positions (City Engineer, Public Works Director, Code Enforcement Officer, City Manager, Hourly City Worker-Professional/Supervisory (Human Resources), City Attorney) **Agency Designated Representatives:** Interim City Manager, Human Resources Consultant, City Attorney

The Special Meeting was adjourned at 5:40 p.m.

CONVENE SPECIAL MEETING – STUDY SESSION
The Special Meeting/Study Session was convened at 5:47 p.m. with Councilmembers Alifano, Kowalczyk, Muller, Patridge & Mayor Fraser present.

- **Strategic Plan/Work Program, Part 1**

Katie Hickox, no address provided, said that an emphasis on locally grown and fresh food available on the coast could help the local economy.

The City Council reviewed the draft Strategic Plan/Work Program, asking for clarification and providing input to staff

The Special Meeting/Study Session was adjourned at 6:55 p.m.

CONVENE REGULAR MEETING/ROLL CALL/PLEDGE OF ALLEGIANCE
The Regular Meeting was convened at 7:05 p.m. with Councilmembers Alifano, Kowalczyk, Muller, Patridge and Mayor Fraser present.

PROCLAMATIONS AND PRESENTATIONS:
None.

MAYOR'S ANNOUNCEMENTS OF COMMUNITY ACTIVITIES AND COMMUNITY SERVICE:
Mayor Fraser introduced Karen Lee, Moon Bay High School Associated Study Body (ASB) President.

Ms. Lee provided information on Half Moon Bay High School ASB and some of their recent activities.

Mayor Fraser provided information on the April 26, 2010 County of San Mateo forum to discuss their $150 million dollar budget deficit and the May 9, 2010 Cabrillo Unified School District forum regarding the proposed school parcel tax.

Mayor Fraser noted that the Dream Machines event will be this upcoming weekend.

REPORT OUT FROM RECENT CLOSED SESSION MEETINGS:
Deputy City Attorney Celestial Cassman reported that during Closed Session the City Council met with its Designated Labor Negotiators and approved Side Letters with the following labor groups: International Union of Operating Engineers Stationary Local 39, Represented Management, Police Management and Police Officers Association.

CITY COUNCIL REPORTS:
Councilmember Muller attended a Sewer Authority Mid-coastside (S.A.M.) Board meeting. He noted that the seasonal Farmers Market resumes May 1, 2010.

Councilmember Alifano said he attended meetings of the Chamber of Commerce Governmental Affairs and the Community School Partnership.

Councilmember Kowalczyk said he attended the trail groundbreaking and a Community Schools Partnership meeting.

Vice Mayor Patridge attended the trail groundbreaking and a City/County Association of Governments meeting.

Mayor Fraser said she attended a Downtown Business Association meeting, a S.A.M. Board meeting and met with staff from Congresswoman Eshoo and Senator Boxer's office regarding several grant opportunities.

CITY MANAGER UPDATES TO COUNCIL:

- April 26-30, 2010 Curbside Household Cleanup Week

PUBLIC FORUM:
Harry Ysselstein, 526 Highland Avenue, spoke regarding the City's financial situation and stated his opposition to raising taxes or fees.

CONSENT CALENDAR:

1. **Waive Reading of Ordinances and Resolutions**
2. **Approve Minutes for the City Council Meetings of March 8, 2010; March 16, 2010 and April 6, 2010**
3. **Accept Warrant Reports Dated March 11, 2010 in the Amount of $316,053.27; March 25, 2010 in the Amount of $167,322.78 and April 8, 2010 in the Amount of $301,143.63**
4. **Accept Planning Director Issued Permits for the Period of April 16-30, 2010**
5. **Adopt Two (2) Resolutions Restricting Park at 723 Mill Street and 501 Main Street and Rescind Resolution Nos. C-16-10 and C-17-10**
6. ***Pulled for separate consideration***

Motion by Alifano/Kowalczyk to approve the Consent Calendar, with the exception of **Item #6, Approval of Amendment One to Agreement with Mid-Coast Television, Inc. for Community Access Television Services Extending Termination Date to September 11, 2011,** which was pulled for separate consideration. Upon a roll call vote, the motion carried 5-0.

7. **Approval of Amendment One to Agreement with Mid-Coast Television, Inc. (MCTV) for Community Access Television Services Extending Termination Date to September 11, 2011**

   (Pulled from Consent Calendar for Separate Consideration)

Administrative Officer Snideman presented the staff report.

Mayor Fraser opened Public Comment at 7:35 p.m.

Roy Salume, 419 Correas, stated his opposition to extending the contract.

Constance Malach, President of MCTV, spoke in support of the proposed contract amendment.

Rich Puricel, MCTV board member, spoke in support of the proposed contract amendment.

Michael Day, MCTV board member, spoke in support of the proposed contract amendment.

Mayor Fraser closed Public Comment at 7:45 p.m.

Discussion ensued between the City Council and staff.

Motion by Kowalczyk/Alifano to approve Amendment One to Agreement with Mid-Coast Television, Inc. (MCTV) for Community Access Television Services Extending Termination Date to September 11, 2011, with the addition of language allowing for a 90-day notice termination clause. Upon a roll call vote, the motion carried 5-0.

ORDINANCES AND PUBLIC HEARINGS

7. **Introduce Ordinance Implementing Policy for Commercial Use of City Parks, Beaches and Trails**

Assistant to the City Manager Crowder presented the staff report.

There were no speakers.

Discussion ensued between the City Council and staff.

Motion by Alifano/Patridge to introduce the Ordinance Implementing Policy for Commercial Use of City Parks, Beaches and Trails. Upon a roll call vote, the motion carried 5-0.

STAFF REPORTS AND RESOLUTIONS

8. **Presentation of the 2010 Multi-Jurisdictional Local Hazard Mitigation Plan for the City of Half Moon Bay**

Chief O'Keefe presented the staff report.

There were no speakers.

Discussion ensued between the City Council and staff.

Motion by Muller/Patridge to accept the 2010 Multi-Jurisdictional Local Hazard Mitigation Plan for the City of Half Moon Bay and direct staff to solicit public input on the plan for a 30 day period. Upon a voice vote, the motion carried 5-0.

9. **Adjustments to the FY 2009-10 Annual Budget of the City of Half Moon Bay**

Interim City Manager Dolder presented the staff report.

Discussion ensued between the City Council and staff.

Mayor Fraser opened Public Comment at 8:32 p.m.

Ozzie Monteiro, 808 Monte Vista Lane, spoke regarding the need to update Half Moon Bay's zoning codes.

Mayor Fraser closed Public Comment at 8:35 p.m.

Motion by Alifano/Kowalczyk to adopt the Resolution Adjusting the FY 2009-10 Annual Budget of the City of Half Moon Bay through Salary Savings, Personnel Reductions and Other Cost Saving Measures. Upon a roll call vote, the motion carried 5-0.

Motion by Alifano/Kowalczyk to adopt the Resolution Amending the Fiscal Year 2009-2010 Budgeted Positions. Upon a roll call vote, the motion carried 5-0.

ADJOURNMENT:

The Regular Meeting was adjourned at 8:36 p.m. in memory of Fiorina Evan.

Respectfully Submitted:

Siobhan Smith, City Clerk

Approved:

Marina Fraser, Mayor 05/12/10

BUSINESS OF THE COUNCIL OF THE CITY OF HALF MOON BAY

AGENDA REPORT

For meeting of: April 20, 2010

TO: Honorable Mayor and City Council

VIA: Michael Dolder, Interim City Manager

FROM: Don O'Keefe, Police Chief

TITLE: **PRESENTATION OF THE 2010 MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN FOR THE CITY OF HALF MOON BAY.**

RECOMMENDATION:
Motion to Accept Presentation of the 2010 Multi-Jurisdictional Local Hazard Mitigation Plan and Direct Staff to Solicit Public Input for a Thirty Day Period Followed by Submittal to the Federal Emergency Management Agency for their Approval

FISCAL IMPACT:
No fiscal impact.

BACKGROUND:
The City of Half Moon Bay is committed to on-going disaster preparedness, response, and recovery through partnerships with other governmental agencies, non-profit organizations and the business community. Much of this effort to date has been concentrated on improving the City's response and educating our residents to cope with emergencies and disasters occurring within our city limits and adjacent coastal communities.

The Association of Bay Area Governments (ABAG), California Emergency Management Agency (CalEMA), and the Federal Emergency Management Agency (FEMA) have teamed up with cities, counties and special districts in the San Francisco Bay Area to maintain and enhance disaster resistance on a regional level through 1) Infrastructure, 2) Health, 3) Housing, 4) Economy, 5) Government Services, 6) Education, 7) Environment, and 8) Land Use Systems and Strategies.

Recently, representatives from the City's Public Works, Planning, Building and the Police Department(s) met to discuss and update Half Moon Bay's Local Hazard Mitigation Plan (Attachment 1). This updated plan describes the mitigation actions that have, or can be taken to mitigate hazards, and ensure the eight commitments listed above are acted upon and are consistent with regional priorities.

If the City Council accepts this report and presentation, the Half Moon Bay Multi-Jurisdictional Local Hazard Mitigation Plan will be placed on the City's website for a period of (30) thirty days for public input. Following the thirty day period, staff will consider any input provided and submit the updated plan to FEMA for review. Once FEMA has approved the City's plan, Staff will present the plan for City Council adoption.

ATTACHMENTS:

1. The City of Half Moon Bay's Multi-Jurisdictional Local Hazard Mitigation Plan

City of Half Moon Bay

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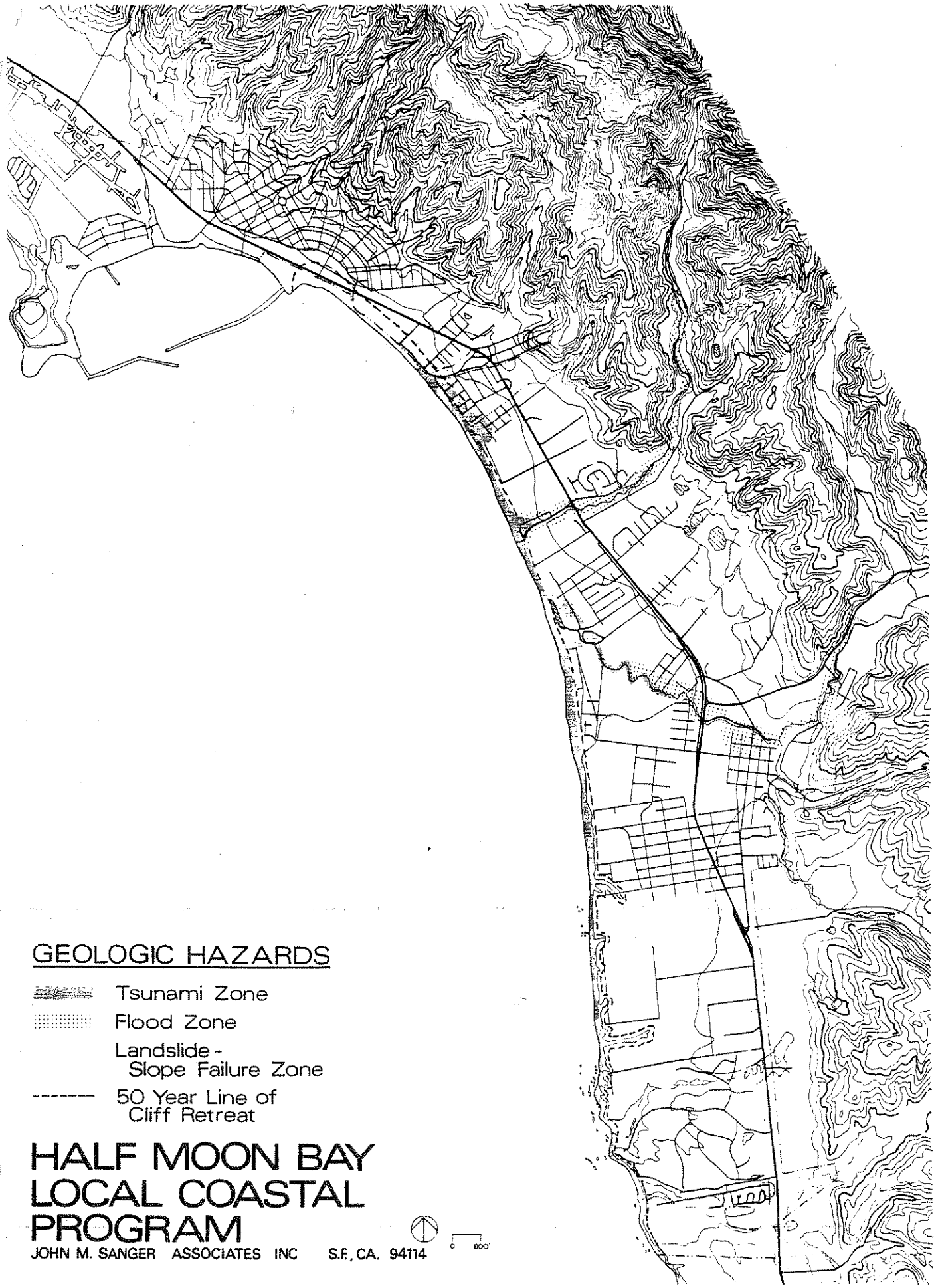
2010 Multi-Jurisdictional Local Hazard Mitigation Plan

2010 Multi-Jurisdictional Local Hazard Mitigation Plan for the City of Half Moon Bay8
Available for Public Review Now

Exhibit C – 2010 Mitigation Strategies

[Available on CD or online at
http://www.abag.ca.gov/bayarea/eqmaps/mitigation/strategy.html]

Exhibit D – Land Use Plan and LCP Map


GEOLOGIC HAZARDS
Tsunami Zone
Flood Zone
Landslide - Slope Failure Zone
50 Year Line of Cliff Retreat
HALF MOON BAY LOCAL COASTAL PROGRAM
JOHN M. SANGER ASSOCIATES INC S.F., CA. 94114
0 800'

CHAPTER 4: HAZARDS

4.1 Coastal Act Policies

30253 New development shall: (1) minimize risks to life and property in areas of high geologic, flood, and fire hazard; (2) assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.

30235 Revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters natural shoreline processes shall be permitted when required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply. Existing marine structures causing water stagnation contributing to pollution problems and fish-kills should be phased out or upgraded where feasible.

30236 Channelizations, dams, and other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (1) necessary water supply projects; (2) flood control projects where no other method for protecting existing structures in the flood plain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) developments where the primary function is the improvement of fish and wildlife habitat.

4.2 Planning Issues

The primary hazards affecting future land use and development in Half Moon Bay involve flooding, cliff retreat, landslides and rockfalls, and tsunami (tidal waves). The extent of these hazards is widespread and susceptible to augmentation by alteration of the environment by human activities. The public ownership of significant beach and cliff areas and existing greenbelt zoning designations mitigate potential damage. However, existing plans and policies are deficient with regard to protecting several specific areas and in lack of development policies and standards in locations of identified hazard potential.

Flood Hazards

The Federal Insurance Administration (Department of Housing and Urban Development) has recently rescinded their flood hazard boundary map for the City of Half Moon Bay, having determined to their satisfaction that there is no substantial danger of a 100-year or 500-year flood in any part of the City. However, as a precautionary measure, the Administration recommends that a zone of approximately 200 feet be used as the boundary of flood hazard where the stream corridor is less than this width. In addition, it cautions against development which would aggravate potential flood hazards. The City's existing creek greenbelt zoning district generally has a minimum width of 200 feet, with greater widths in areas of full channel width. A full assessment of potential inundation from upstream dam failure has not been completed. Based upon preliminary analysis, the zone of potential inundation from dam failure is wider than 200 feet along some portions of Pilarcitos Creek. This zone ranges in width from 200 to 600 feet. Studies are now in preparation to determine the potential for future dam failure resulting from seismic events.

The existing Pilarcitos Creek channel's capacity to accommodate heavy flows between Main Street and Highway 1 appears to have been reduced by construction of the bridge on Main Street and heavy overgrowth and dumping in the creek between Main Street and Highway 1. Some channel improvements may be required in order to eliminate hazards to existing or new structures in this area, possibly including ultimate reconstruction of the bridge to expand the effective channel for water flows. Hazards west of Highway 1 may be more effectively avoided by controls on new development, although some existing structures may be in the zone of potential inundation from dam failure.

Erosion: Coastal Bluff Retreat and Upland Slope Failure

Erosion-related hazards in the Half Moon Bay Coastal Zone comprise two areas of concern: coastal bluff instability or seacliff retreat and upland slope failure. Bluff erosion poses a major immediate threat in certain areas and a long-term hazard along the entire Half Moon Bay shoreline.

Current rates of seacliff retreat north of Magellan Road indicate that major areas could be lost within 50 years. (See Study Paper on "Marine and Water Resources, Hazards and Sensitive Habitats", Figure 2: "Shoreline"). This would make the construction of permanent structures hazardous.

Artificial stabilization of the coastal bluffs has been proposed to protect Highway 1, yet the necessary extent and long-range implications of such measures remain unknown. Any stabilizing measures should protect existing structures as well. Parking facilities or roads near the bluff edge could increase cliff and

foredune erosion and reduce run-off absorption essential for cliff stability. Further development along Miramontes Point and irrigation of the golf course, if properly developed, should not accelerate cliff retreat and erosion, posing hazards for any permanent structures and potential loss of golf course land.

Seismic and Geologic Hazards

The primary seismic hazards which occur within Half Moon Bay are landslides and bluff failure along the coast, tsunami inundation, and potential liquefaction of unconsolidated and moderately consolidated geologic materials. Although no active faults run through the City itself, the San Andreas Fault traverses the Peninsula to the east and the Seal Cove-San Gregario Fault crosses Half Moon Bay southeast of Pillar Point. Both the unconsolidated marine terrace materials of the coastal bluffs and the vertical cliffs of the Purissima Formation are subject to slumps and rockfalls activated by seismic shock.

All steep slope areas are considered potential sites for landslide activity, where caution should be taken in new development not to aggravate landslide potential and hillside erosion.

Tsunami hazard is present in the low-lying coastal areas, particularly at the mouth of drainages. The inland extent of run-up is not known; it has been mapped to the 20-foot contour. Inundation could be greater, depending on local coastal, tidal, and storm conditions. The potential for liquefaction or ground failure caused by the temporary transformation of granular soils into a liquefied state is low to moderate in Half Moon Bay and generally restricted to alluvial channels and the flat terraces underlaid by consolidated sands and a high water table.

Hazards to Existing and Potential Private Residential or Commercial Development

Existing structures along Mirada Road are threatened by high cliff retreat. Existing riprap may not withstand sea attack or tsunami. Existing and future development in Miramar south of Medio Creek is subject to a high rate of cliff retreat.

The subdivision and shopping center along Pilarcitos Creek is located in potential dam failure inundation area and tsunami zones and may be damaged or lost in the future; additional development within the same area would risk the same hazards. The same area is one of moderate risk of liquefaction potential during earthquakes.

The Half Moon Bay Sewage Treatment Plant and portions of the proposed SAM pipeline are located within zones of inundation from dam failure and tsunami.

Surface-Drainage and Local Flooding

Extensive runoff from the coastal hills results in drainage problems where natural contours, swales and gullies, or channelized areas are unable to handle runoff concentration and protect existing developed areas (e.g. Grandview and Newport Terrace subdivisions). The need for improved drainage presents an opportunity to establish; (1) planning measures which regulate the pattern and location of new development, and (2) development practices which promote on-site infiltration of surface runoff.

Coastal Terrace Irrigation

Irrigation of the coastal terrace for agriculture or landscape irrigation (including parks and golf courses) increases the potential for accelerated coastal erosion and seacliff retreat, as well as localized gullying. Since irrigation is critical to the viability of agriculture in these areas, there is a potential conflict between Coastal Act policies. Where irrigated agriculture is to continue, setbacks from the cliff edge should be instituted. The opportunity exists also to define a "protective" zone appropriate for restoration of coastal vegetative communities for the purposes of reducing soil saturation and enhancing bluff stability. This is to be accomplished in large measure by the policies in Section 3.

4.3 Policies

Seawall and Shoreline Structures

Policy 4-1

Seawalls and cliff-retaining structures shall not be permitted unless the City determines they are necessary for preservation of existing structures, and has determined that there are no other less environmentally damaging alternatives for protection of existing development. If such structures are permitted, they shall be designed to preserve the maximum amount of existing beach, to ensure lateral access along the shoreline, and to assure that all existing endangered development within the area of the improvement is protected as a part of the project; such structures shall not be designed so as to encompass an area larger than that necessary to protect existing structures. An applicant for such a structure shall include a geologic report indicating that the structure will succeed in stabilizing that portion of the shoreline which is subject to severe erosion and will not aggravate erosion in other shoreline areas.

Policy 4-2:

Revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters natural shoreline processes shall be permitted when required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply. (Portion of Section 30235 Coastal Act of 1976.)

Policy 4-3:

Development permitted shall comply with the following controls and regulations:

(A) The area of demonstration of stability includes the base, face, and top of all bluffs and cliffs. The extent of the bluff top considered should include the area between the face of the bluff and a line described on the bluff top by the intersection of a plane inclined a 20 degree angle from the horizontal passing through the toe of the bluff or cliff, or 50 feet inland from the edge of the cliff or bluff, whichever is greater.

(B) Permit bluff and cliff top development only if design and setback provisions are adequate to assure stability and structural integrity for the expected economic life span of the development (at least 50 years) and if the development (including storm runoff, foot traffic, grading, irrigation, and septic tanks) will neither create nor contribute significantly to erosion problems or geologic instability of the site or surrounding area. Prohibit development on bluff faces except for stairways for public access to the beach.

(C) Prohibit land divisions or new structures identified in areas described in A and B above that would require the need for bluff protection work.

(D) Require the submittal of a site stability evaluation report for an area of stability demonstration prepared by a soils engineer or a certified engineering geologist, as appropriate, acting within their areas of expertise, based on an on-site evaluation. The report shall consider:

1. Historic, current and foreseeable cliff erosion, including investigation of recorded land surveys and tax assessment records in addition to the use of historic maps and photographs where available, and possible changes in shore configuration and transport.

2. Cliff geometry and site topography, extending the surveying work beyond the site as needed to depict

unusual geomorphic conditions that might affect the site and the proposed development.

3. Geologic conditions, including soil, sediment and rock types and characteristics in addition to structural features such as bedding, joints, and faults.

4. Evidence of past or potential landslide conditions, the implications of such conditions for the proposed development, and the potential effects of the development on landslide activity.

5. Wave and tidal action, including effects of marine erosion on seacliffs.

6. Ground and surface water conditions and variations, including hydrologic changes caused by the development (e.g., introduction of irrigation water to the groundwater system; alterations in surface drainage).

7. Potential effects of seismic forces resulting from a maximum credible earthquake.

8. Effects of the proposed development including siting and design of structures, landscaping, drainage, grading, and impacts of construction activity on the stability of the site and adjacent area.

9. Any other factors that may affect slope stability.

10. Potential erodibility of site and mitigating measures to be used to ensure minimized erosion problems during and after construction (i.e., landscaping and drainage design).

Bluff Protection

Policy 4-4:

In the absence of a determination supported by a site-specific survey by a qualified geologist and biologist to the contrary, within 100 feet from the bluff or foredune edge, drought-tolerant coastal vegetation capable of enhancing bluff and dune stability shall be installed and maintained as a part of any new development. Grading as may be required to establish proper drainage, to install minor improvement (e.g. trails) and to restore eroded areas and to provide permitted accessways shall direct water runoff away from the edge of the bluff or be handled in a manner so as to prevent damage to the bluff by surface and percolating water.

Policy 4-5:

No development shall be permitted on the bluff face, except for engineered accessways to provide public beach access. Drainage pipes shall be allowed only where no other less environmentally damaging drain system is feasible and the drain pipes are designed and placed to minimize impacts to the bluff face, toe, and beach. Drainage devices extending over the bluff face shall not be permitted if water can be directed away from the bluff face.

Geotechnical Hazards

Policy 4-6:

Applications for grading and building permits and applications for subdivisions shall be reviewed for adjacency to, threats from, and impacts on geologic hazards arising from seismic events, tsunami run-up, landslides, flooding, or other geologic hazards such as expansive soils and subsidence areas. In areas of known geologic hazards, as indicated on the Geologic Hazards Map, a geologic report shall be required. Mitigation measures shall be required where necessary.

Policy 4-7:

In areas of flooding due to tsunamis or dam failure, no new development shall be permitted unless the applicant or subsequent study demonstrates that the hazard no longer exists or has been or will be reduced or eliminated by improvements which are consistent with the policies of this Plan and that the development will not contribute to flood hazards or require the expenditure of public funds for flood control works. Where not otherwise indicated, the flood hazard zone shall be considered to be a zone defined by the measured distance of 100 feet from the centerline of the creek to both sides of the creek. Non-structural agricultural uses, trails, roads, and parking lots shall be permitted, provided that such uses shall not be permitted within the area of stream corridor. (See Policies in Section 3 on Protection of Sensitive Habitats.

Policy 4-8:

No new permitted development shall cause or contribute to flood hazards.

Policy 4-9:

All development shall be designed and constructed to prevent increases in runoff that would erode natural drainage courses. Flows from graded areas shall be kept to an absolute minimum, not exceeding the normal rate of erosion and runoff from that of the undeveloped land. Storm water outfalls, gutters, and conduit discharge shall be dissipated.