FLOODPLAIN MANAGEMENT PLAN

Monterey County, CA

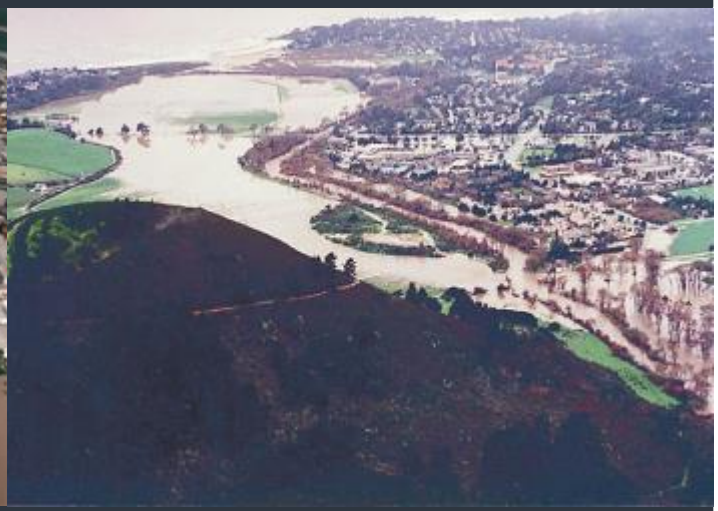
2014 Update

Prepared by:
Monterey County Water Resources Agency

Salinas River, March 1995

Pajaro, March 1995

Castroville, March 1995



Carmel River, February 1998

Table of Contents

APPENDIX

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

ASFPM	Association of State Floodplain Managers
BFE	Base Flood Elevation
BMP	Best Management Practice
CA OES	California Office of Emergency Services
CEQA	California Environmental Quality Act
CFM	Certified Floodplain Manager
CFS	Cubic Feet per Second
CMP	Corrugated Metal Pipe
CRS	Community Rating System
DFIRM	Digital Flood Insurance Rate Map
DSOD	California Department of Water Resources Division of Safety of Dams
EOC	Emergency Operations Center
EPB	Ecosystem Protective Barrier
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FHBM	Flood Hazard Boundary Map
FIA	Federal Insurance Administration
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FMA	Federal Mitigation Assistance
FMP	Floodplain Management Plan
GIS	Geographic Information System
GPU	General Plan Update
HMGP	Hazard Mitigation Grant Program
ICC	Increased Cost of Compliance
ISMP	Interim Sandbar Management Plan
ISO	Insurance Services Office
MCC	Monterey County Code
MCWRA	Monterey County Water Resources Agency
MCDPW	Monterey County Department of Public Works
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NFIP	National Flood Insurance Program
NOAA	National Oceanographic and Atmospheric Administration
PDM	Pre-disaster Mitigation
RL	Repetitive Loss
SFHA	Special Flood Hazard Area
SMP	Stream Maintenance Program
SRPS	Scenic Road Protection Structure
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USGS	United States Geological Survey

1. Introduction

This Floodplain Management Plan (FMP) for Monterey County is intended to meet the requirement for continued participation in the Federal Emergency Management Agency (FEMA) National Flood Insurance Program (NFIP) Community Rating System (CRS). The Monterey County Water Resources Agency (MCWRA) presents this FMP to assess the flooding hazards within the unincorporated areas of the County; to summarize the County's floodplain management program strategy; to provide information on flooding sources affecting Monterey County Repetitive Loss (RL) Areas; to describe current flood mitigation strategy; and to present an implementation plan for flood hazard reduction. This FMP was prepared with input from County residents, responsible officials, and with the support of the State of California Office of Emergency Services (CalOES) and FEMA.

1.1 Purpose and Scope

The 2014 Update of the FMP for Monterey County was prepared in accordance with the 10-step planning process outlined in the 2013 CRS Coordinator's Manual and is intended to primarily address concerns with Repetitive Loss (RL) Properties under the NFIP. The County's Multi-Jurisdiction Hazard Mitigation Plan (MJHMP) completed in 2014 contains a more comprehensive hazard identification and risk assessment for countywide flooding issues.

The 2014 Update of the FMP presents and reviews the County's flood management efforts under the six credited floodplain management planning (CRS FMP) categories. These categories are credited under Activity 500 Flood Damage Reduction Activities of FEMA's NFIP/CRS Program. The 2014 Update of the FMP includes a chapter on each of the following credited CRS FMP categories:

- Preventive (Chapter 6)
- Property Protection (Chapter 7)
- Natural Resource Protection (Chapter 8)
- Emergency Services (Chapter 9)
- Structural Projects (Chapter 10)
- Public Information (Chapter 11)

1.2 The FMP and the FEMA NFIP/CRS Program

The MCWRA developed Monterey County's first FMP in 2002 in fulfillment of a basic requirement for continued participation in the NFIP/CRS Program. The CRS administered by FEMA is implemented to recognize and encourage community floodplain management activities that exceed the minimum NFIP standards.

For CRS purposes Monterey County is considered a Repetitive Loss Category C community. A category "C" community is defined as one with 10 or more RL properties that have not been mitigated. As a basic requirement for continued enrollment in the CRS, Monterey County was required to prepare, adopt, and implement a floodplain management plan to reduce damages to these flood-prone properties.

The FMP objective is to provide specific guidance for potential mitigation measures and activities to best address the problems and needs of each Repetitive Loss (RL) Area. In addition, the FMP presents descriptions of countywide floodplain management goals and policies; steps for public coordination; a description of those areas affected by historic flooding; current flood control projects; and a comprehensive assessment of flooding problems.

The FMP for Monterey County is required to be updated every five years and an annual evaluation report on the progress towards plan implementation must be prepared at least once each year. Both the FMP and the annual report are required to be released to the media and made available to the public through submission to the MCWRA Board of Directors and the Monterey County Board of Supervisors (BOS).

National Flood Insurance Program and the CRS

The NFIP transfers costs of private property flood losses from taxpayers to floodplain property owners through flood insurance premiums, provides financial aid to flood victims, encourages development away from flood-prone areas, and requires new and substantially improved structures to be constructed in a way that minimizes or prevents flood damage. The NFIP, through partnerships with communities, the insurance industry, and the lending industry, helps reduce flood damage by nearly $1 billion a year nationwide.

Monterey County joined the NFIP on January 30, 1984. Compliance and ongoing participation in the NFIP ensures that all Monterey County residents can purchase flood insurance. As of December 31, 2014, there were 1,627 flood insurance policies in effect throughout the unincorporated areas of the County, with an annual combined premium amount totaling $1,994,750.[1] The following is a list of geographic areas in unincorporated Monterey County representing where the policies reside:

- Carmel 44%
- North County 28%
- Carmel Valley 12%
- Greater/Central Salinas 11%
- Del Monte Forest/Big Sur 3%
- Monterey Peninsula 1%
- South County 1%

Nationwide, over 5.5 million people hold flood insurance policies. Of the over 22,000 communities participating in the NFIP nationwide, only 1,296 communities participate in the CRS. These 1,296 communities represent a large portion of the nation's flood risk with over 67% of the NFIP's policy base located in these communities.[2]

Monterey County has voluntary participated in the NFIP/CRS for over 20 years. In exchange for the community's proactive efforts in reducing flood risk, policyholders receive reduced flood insurance premiums for buildings in the floodplain.

[1] Source: FEMA iService Team/NFIP Bureau and Statistical Agent.
[2] Percentage as of March 2014 (http:www.fema.gov Fact Sheet NFIP_CRS_March 2014 508.pdf).

Lower flood insurance premiums are only one of the rewards a community receives from participating in the CRS. Other benefits include:

- Citizens and property owners in CRS communities have increased opportunities to learn about risk, evaluate their individual vulnerabilities, and take action to protect themselves, as well as their homes and businesses.
- CRS floodplain management activities provide enhanced public safety, reduced damage to property and public infrastructure, and avoidance of economic disruption and loss.
- Communities can evaluate the effectiveness of their flood programs against a nationally recognized benchmark.
- Technical assistance in designing and implementing some activities is available to community officials at no charge.
- CRS communities have incentives to maintain and improve their flood programs over time.

Monterey County NFIP/CRS Benefits

On 9/9/2013, the Insurance Services Office, Inc. (ISO)/CRS Specialist visited Monterey County to conduct a CRS verification visit. MCWRA staff met with the ISO/CRS Specialist. A total of 1,848 credit points were verified which resulted in a recommendation that the community retrograde from a CRS Class 5 to a CRS Class 7. As of April 1, 2015, Monterey County NFIP policy holders receive a 15% premium discount (in the Special Flood Hazard Area) or 5% discount (outside the Special Flood Hazard Area). The County's participation in the CRS program saves NFIP-insured residents $345,077 per year or appropriately $212 per individual policy.[3]

Floodplain Regulations

In order for flood insurance to be available to property owners, a community must first adopt and enforce the minimum federal standards of the NFIP. Community-adopted floodplain regulations mitigate future flood losses through sound, community-enforced building and zoning ordinances, which in turn provide access to affordable, federally backed flood insurance. Monterey County has various regulations and policies which provide floodplain development standards. The minimum FEMA requirements necessary for participation in the regular phase of the NFIP are contained within Monterey County Code (MCC) Chapter 16.16 *Regulations for Floodplains in Monterey County.* This chapter also includes higher regulatory standards that are credited through the CRS. Additional regulations and policies are also found within the Monterey County 2010 General Plan and the Inland Zoning Ordinance Chapter 21.64.130 *Regulations for Land Use in the Carmel Valley Floodplain*.

1.3 Goals of the FMP

The primary goal of the County's floodplain management program and this FMP is to minimize flood losses countywide with special attention to known RL Areas. Monterey County has 13 RL Areas which contain a total of 109 RL Properties. The community is required to map its RL Areas and this was partially completed in the initial 2002 FMP. These 13 RL Areas consist of neighboring buildings (including uninsured ones) that were subject to the same flood risk as those on the FEMA

[3] Source: FEMA iService Team/NFIP Bureau and Statistical Agent.

RL Property list. In this update, the MCWRA utilized GIS mapping to identify which properties were located near RL Properties. The MCWRA created a new map for each RL Area by closely examining the RL Properties, the watercourse, and the buildings subject to flooding. After the RL Area was identified, a list of the addresses of all improved parcels was created.

2. County Profile Summary

2.1 Geography, Demographics, and Climate

Area

Monterey County is one of the largest counties in the State of California and covers more than 3,300 square miles, including 1,900 acres of inland water and approximately 100 miles of coastline. Monterey County is located in west-central California, between Los Angeles and San Francisco, on the Pacific Coast. The county boundary on the west is formed by the Pacific Ocean, including Monterey Bay and the Big Sur Coast. In addition to its coastal resources, the county possesses approximately 1.3 million acres of land dedicated to agriculture, most of which (approximately 80%) is used for grazing.[4] Agriculture is the largest land use representing almost 60% of the total land area. The Salinas Valley has long earned the description "the salad bowl of the nation." Monterey County is bordered by Santa Cruz County to the north; San Luis Obispo County to the south; and San Benito, Kings, and Fresno Counties to the east.

Population

The population of the County has continued its slow, but regular, growth. According to the County's Economic Development Department, the County's population grew from 401,762 in 2000 to 415,057 in 2010, a change of 3.3 percent. The California Department of Finance statistics for January 2012 show Monterey County's population has grown to 420,688. Of that total, 101,644 residents live in the unincorporated area. The California Department of Finance projects the County's population to be 431,493 in 2015, and 436,107 in 2020.

Climate and Rainfall

The climate of Monterey County is characterized by warm, dry summers and cool, moist winters. The average temperature is approximately 57 degrees F. Average rainfall varies, but is approximately 15 inches per year, although in some years rainfall is in excess of 30 inches. Approximately 90 percent of this rainfall occurs between November and April. Measurable precipitation averages 51 days per year. Mean annual precipitation varies considerably throughout Monterey County from 11 inches in the Salinas Valley to 70 inches in the Santa Lucia Mountains. The link to water year precipitation totals as reported by the MCWRA for the Salinas Valley is provided here:
http://www.mcwra.co.monterey.ca.us/quarterly_salinas_valley_water_conditions/quarterly_salinas_valley_water_conditions.php

2.2 Watersheds

Monterey County consists of a four predominant watersheds draining to the Salinas River, the Pajaro River, the Carmel River, and the Big Sur River. These watersheds vary in patterns of land use from rural open space and permanent grazing, to farmland and agricultural industrial, to low, medium, and high density residential use. Increased development over the past 100 years has resulted in increased runoff that poses a flood threat. To accommodate the increasing runoff, many cities and communities in these watersheds have developed an extensive system of channels and

[4] 2010 Monterey County General Plan.

storm drain facilities. The overall drainage pattern in the county is from south to north; this is the direction of flow for the Salinas River which is the largest river on the central coast of California. The four predominant watersheds are described below and listed in order of magnitude, from largest to smallest.

Salinas River Watershed

The Salinas River Watershed originates 4,000 feet above sea level in the La Panza Range near Santa Margarita in San Luis Obispo County and drains a 4,200 square mile area. The Gabilan and Santa Lucia Ranges are the sources of the principal watercourses in the area. The Salinas River has three main tributaries, namely, the Nacimiento, San Antonio, and Arroyo Seco Rivers. It flows for over 110 miles within Monterey County and empties into the Monterey Bay.

Pajaro River Watershed

The Pajaro River Watershed originates from 4,700 feet above sea level in the Diablo and Gabilan Ranges in San Benito County and drains a 1,300 square mile area. The watershed is bound by the Santa Cruz Mountains in the north, and the Gabilan Range in the south. The watershed area spans four counties, namely, Santa Cruz, Santa Clara, San Benito, and Monterey. The Pajaro River has numerous tributaries, which include Corralitos, Uvas, Llagas, San Benito, Pacheco, and Santa Ana Creeks, and flows for approximately 30 miles where it empties into Monterey Bay.

Carmel River Watershed

The Carmel River Watershed originates 4,000 feet above sea level in the Santa Lucia Range and drains a 256 square mile area. The Carmel River has two main tributaries which, namely, Cachagua and Tularcitos Creeks, and flows for approximately 26 miles where it empties into the Pacific Ocean.

Big Sur River Watershed

The Big Sur River Watershed originates from 3,000 feet above sea level along Pine Ridge in the Santa Lucia Mountains and drains a 60 square mile area. The Big Sur River has numerous tributaries which include Redwood Creek, Ventana Creek, Post Creek, and Pfeiffer-Redwood Creek, and flows for approximately 15 miles where it empties into the Pacific Ocean.

2.3 Government Structure

Many communities in unincorporated Monterey County are subject to the threats of flooding, erosion, overflow, and debris problems. Communities found throughout the County in areas such as North County, Greater Salinas, Central Salinas Valley, South County, Cachagua/Carmel Valley, and the coast, are only habitable to the extent that the flood protection systems are functioning. For over 100 years, Monterey County has been constructing and operating flood control and drainage facilities to alleviate flood hazards in these areas. The MCWRA (formerly the Monterey County Flood Control and Water Conservation District), the Monterey County Public Works Department, and other similar entities maintain an extensive number of dams, channels, levees, pump stations, tide-gates, storm drains, and other operations in these areas.

2.4 Floodplain Management Program

The MCWRA is primarily responsible for most aspects of the County's floodplain management program. The objective of the program is to promote health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specifics areas by provisions designed to:

- Protect human life and health;
- Minimize expenditure of public money for costly flood control projects;
- Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- Minimize prolonged business interruptions;
- Minimize damage to public facilities and utilities such as water and gas mains; electric, telephone, and sewer lines; and streets and bridges located in SFHAs;
- Help maintain a stable tax base by providing for the sound use and development of SFHAs so as to minimize future blighted areas caused by flooding;
- Ensure that potential buyers are notified that property is in a SFHA; and;
- Ensure that those who occupy SFHAs assume responsibility for their actions.

Activities in the program include reviewing new development permit applications for proper flood-proofing and elevation construction methods, ensuring sufficient setbacks from minor and major watercourses, and planning for appropriate drainage capacity. Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in the flood hazard. As shown in Figure 1, a *floodway* is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe, where the floodway must be kept free of obstruction.

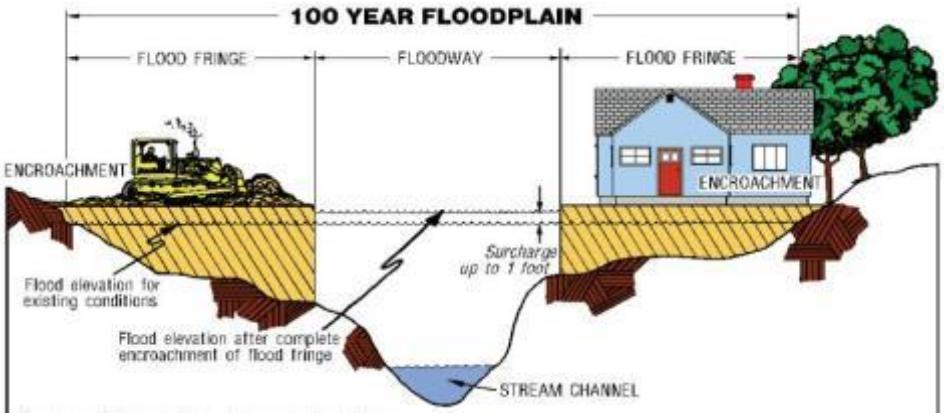


Figure 1: Regulatory Floodway

The MCWRA is responsible for prohibiting encroachments, including fill, new construction, and substantial improvements, within the FEMA-defined regulatory floodway. The County's floodplain management program meets the minimum requirements for participation in the NFIP, and includes

additional regulations which help the County maintain its Class 7 rating in FEMA's NFIP/CRS Program.

2.5 Development Trends in the Floodplain

Careful planning of development in the floodplain is essential to minimizing flood risk and losses. The MCWRA General Manager is the designated local floodplain administrator who is responsible for regulating development in the floodplain. From 1996 to 2013, a total of 543 discretionary permit applications, nearly 32 per year, received conditions of approval related to floodplain management regulations. In addition, from 2002 to 2013, a total of 441 ministerial permit applications (including both building and grading permit applications), or approximately 40 per year, were subject to floodplain management regulations. Figure 2 shows the annual number of discretionary and ministerial applications within the 100-year floodplain. Development activity reports for permits applications received since the last FMP (2008-2013) are provided in Appendix D. The reports include the geographic area and development description of each project. Only two projects have received variances to the Monterey County floodplain regulations since 1984. These variances were granted because the structures met the criteria for historic qualification in accordance with MCC Chapter 16.16.060.

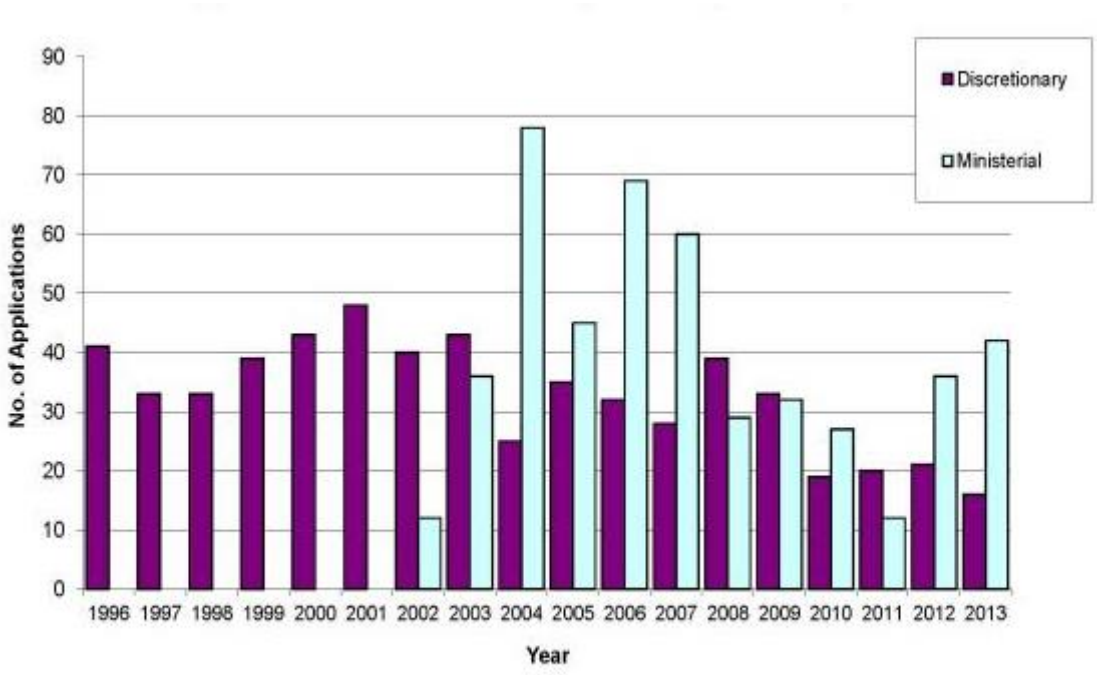


Figure 2: Floodplain Development Permits 1996-2013

3. FMP Planning and Public Participation

3.1 Background

Monterey County has experienced significant flooding throughout the past century. In 1947, the State Department of Water Resources (DWR) through legislation formed the Monterey County Flood Control and Water Conservation District to manage flood risk throughout Monterey County. This District changed its name and is now referred to as the MCWRA and is primarily responsible for floodplain management efforts and the consequences of flood losses.

Current CRS guidelines require the involvement of the public, other agencies, and stakeholders in the formation of an FMP. In 2002, an FMP working group was established to facilitate the development of the original FMP. The working group members included staff from the MCWRA, Monterey County Environmental Health, Monterey County Office of Emergency Services, Monterey Peninsula Water Management District, Pajaro Valley Water Management Agency, the State NFIP Coordinator, the CalOES, and FEMA Region IX.

Throughout 2014 and 2015, the MCWRA worked in collaboration with the Monterey County Resource Management Agency; the California Office of Emergency Services; the FEMA Region IX Office; and, the Insurance Services Office, Inc./CRS Specialist on the 2014 FMP Update.

3.2 Planning and Participation

The focus of the original FMP was the unincorporated areas of the County that had been subject to repetitive flood losses. This continues to be the focus of the FMP's 2014 Update. The specific RL Areas targeted were located in Big Sur, Carmel, Carmel Valley, Carmel Highlands, Castroville, Greenfield, Pebble Beach, Prunedale, and Salinas.

As required by CRS guidelines, a public meeting must be held at the end of the planning process at least two weeks before submittal of the recommended plan to the community's governing body. The original FMP was presented to the MCWRA's Planning Committee meeting on October 10, 2002, and public comments were received. Additional comments were accepted at MCWRA's Board of Directors meeting on December 2, 2002, and the Monterey County BOS adopted the FMP on December 3, 2002.

The FMP 2014 Update was presented at MCWRA's Planning Committee meeting on August 12, 2015, and considered at MCWRA's Board of Directors (BOD) meeting on August 24, 2015. Public comments were received and the MCWRA BOD directed staff to meet and confer with the Monterey County Resource Management Agency (RMA). The MCWRA BOD specifically asked staff to have RMA comment on whether the FMP 2014 Update was consistent with the 2010 Monterey County General Plan; if the FMP 2014 Update should be considered by the Monterey County Planning Commission; and, whether the FMP recommendations were appropriate.

The MCWRA and RMA met twice in September 2015 to discuss these concerns. During these meetings, the RMA confirmed that the FMP 2014 Update was consistent with the 2010 Monterey County General Plan; and, stated the Planning Commission generally only considers matters involving the Zoning Code (Titles 19, 20, & 21). Therefore, since the recommendations do not

propose to changes to the Zoning Code, there would be limited benefit to having the Planning Commission consider the FMP. The RMA also provided comments on how to provide more clarity to the FMP 2014 Update and which program recommendations should be modified or deleted. The RMA comments were implemented, as appropriate. The MCWRA staff has scheduled to bring the FMP 2014 Update back to the MCWRA BOD on October 26, 2015, and to present it in coordination with the RMA for final adoption at the Monterey County BOS no later than November 2015.

4. Historical Flooding in Monterey County

Investigation of flooding from 1911 through 2014 indicates that flood conditions and flood damage were experienced in portions of Monterey County in March 1911, January 1914, February 1922, November 1926, December 1931, February 1937, February 1938, March 1941, January 1943, February 1945, January 1952, December 1955, January 1956, April 1958, February 1962, December 1966, January and February 1969, February 1973, February 1978, March 1983, January and March 1995, February 1998, January 2008, October 2010, March 2011, and December 2014.

In the past 20 years, the County has received five federal disaster declarations that covered flood events.[5] NFIP claims for flood losses in unincorporated Monterey County total 1,116 claims for a cumulative amount of $21,825,432.[6]

Salinas and Carmel Rivers

Monterey County experienced severe damages in 1969 as the result of two distinct floods – one at the end of January and one at the end of February. Each of these resulted in Monterey County being declared a disaster area. In each flood the Salinas and Carmel Rivers went on a rampage. County officials said they were certain that the $6.5 million flood damage caused along the Salinas River in 1966, of which $4 million was in Monterey County alone, would be exceeded (*Monterey Peninsula Herald*, January 27, 1969). In response to these floods, the U.S. Army Corps of Engineers produced the *Report on January and February 1969 Floods for Central Coastal Streams California*, dated September 1970, which determined appropriately 50 high water mark elevations for locations along the Salinas River.

Salinas River

The winter of 1983 "El Niño" storms brought an extremely unusual series of high tides, storm surges, and storm waves along the coast. Heavy rains caused extensive flooding and erosion in the Salinas Valley. Farmland and roadways were damaged, and Monterey County was declared a disaster area.

Pajaro River

The two largest floods on the Pajaro River occurred in 1955 and 1958. The associated discharges on the Pajaro River for these events were 24,000 cfs and 23,500 cfs, respectively, at the USGS Chittenden gage. These floods estimated at 27 years and 26 year flood events, or 4% annual chance floods.

Coastal Areas

In January 1978, a series of storms emanated from a more southerly direction than normally occurs. Consequently, some of the more protected beaches were damaged. Jetties and breakwater barriers were overtopped and in some cases undermined. Direct wave damage occurred to many beachfront homes, especially in the more populated beachfront areas along Monterey Bay. Seawalls and temporary barriers failed to protect beachfront properties from the ravages of the 1978 storms.

[5] Source: MJHMP, 9/2014.
[6] FEMA.

4.1 Flood Events of 1995 & 1998

January 1995

In January 1995, Monterey County experienced prolonged and sustained precipitation resulting in extensive flooding throughout the region. Most river valleys were affected with major damage experienced in the Pajaro Valley and Carmel Valley. On January 9 and 10, 1995, Monterey County was subjected to an intense winter storm during which up to 6 inches of rainfall was received in some areas. The MCWRA rated the storm as a 10- to 20-year event.

In Carmel Valley, five localized areas were significantly affected by downstream flooding of the Carmel River including Camp Stephani, the Robles Del Rio area of Carmel Valley Village, the area adjacent to the Schulte Road Bridge, the Rio Road area adjacent to Highway 1, and Mission Fields.

Figure 3: Salinas River Photo, March 1995

The January 1995 flood damaged 125 residences resulting in an estimated damage cost of approximately $2.5 million. In addition, an estimated $927,000 in damage to public facilities and utilities was incurred. Various agencies and organizations were involved in the response to the flood. The Monterey County Emergency Operations Center (EOC) was activated by the Office of Emergency Services (OES), three "Incident Command Posts" were established in the flooded areas, and the Emergency Broadcast System was utilized.

The Monterey County BOS declared a local emergency and the Governor declared a state of emergency in Monterey County and other affected counties. On 01/10/1995, a Major Disaster Declaration was declared by President Clinton as a result of damages sustained by severe winter storms, flooding, landslides, and mud flows throughout the State of California (FEMA 1044-DR-CA).

Shortly after the January 1995 flood, the MCWRA made a number of recommendations to the Monterey County BOS for corrective action. These recommendations included the installation of better communication equipment, more concise flood emergency procedures, and an increase in floodplain resident responsibility through the establishment of Neighborhood Emergency Preparedness Plans. The Board Report also outlined recommendations for updating the status of the "Carmel Valley Coordinated Emergency Response Plan," which had been in draft form since 1990. They designated Mission Fields and the Rio Road area as "Communities at Risk" in the Carmel River Flood Plan of the County's Multi-Hazard Emergency Plan.

March 1995

From March 10–13, 1995, Monterey County experienced a second significant winter storm that resulted in sustained precipitation falling on already-saturated watersheds. Devastating flooding occurred throughout the County, particularly along the Carmel, Arroyo Seco, Salinas, and Pajaro

Rivers. Damage was extensive throughout the County with virtually every community affected. Pajaro, Castroville, Mission Fields, Carmel Valley, Cachagua, Carmel Highlands, Spreckels, and Big Sur sustained devastating damage.

Over 1,500 residences were damaged, including 60 homes that were declared uninhabitable. In addition, an estimated 110 businesses were affected, and the tourism industry sustained substantial losses for a period of several months.

In all, over 11,000 people were directly affected, and major portions of the County's agricultural lands were subjected to widespread destruction. On March 12, 1995, California was again declared a Federal Disaster Area designated due to the same causes (FEMA 1046-DR-CA).

In particular, flooding of the Salinas, Carmel, and Pajaro Rivers forced mass evacuations in San Ardo, King City, Greenfield, Soledad, Gonzales, Chualar, Spreckels, the River Road area, parts of Salinas, Castroville, Moss Landing, Pajaro, and the Carmel Valley. Table 1 is a summary of the damage that occurred in each community.

Table 1: Community damage due to March 1995 flood events

Location Area	Damage
Carmel Valley	400 residences damaged 68 businesses damaged 2,500 evacuations
Mission Fields	220 residences damaged Total evacuation of all residences
Robles Del Rio	80 residences damaged
Cachagua	100-150 residences damaged
Pajaro	All residences (600+) and businesses damaged, 2,500 (out of a total population of 5,000) evacuations
Castroville	312 residences damaged 38 businesses damaged 1,320 evacuations
Spreckels	13 residences damaged

Damage to Private Property

The March floods resulted in county-wide devastation to private property resulting in over 11,000 evacuations and damage to 1,500 homes and 110 businesses.

Damage to Public Facilities

At the height of the flood on March 13, 1995, 63 roads and 15 bridges were closed, including the Highway 1 Bridge over the Carmel River. The closure of the Highway 1 Bridge over the Carmel River resulted in the complete elimination of access to portions of Carmel Valley, Carmel Highlands, and Big Sur for a period of several days, requiring evacuations to take place with helicopters.

Other significant effects to public facilities and services included the following:

- Of the 63 roads and 15 bridges that were closed, 62 roads and three bridges sustained damage.

- Public and private water systems were damaged, affecting approximately 3,500 homes and businesses. Eight large water systems and over fifty small systems were affected with the largest being Castroville (1,350 connections). Many residents were without domestic water service for extended periods. A number of areas were required to boil domestic water prior to use until the water quality was confirmed as safe.
- Sewage treatment facilities and private septic systems along all three major rivers (Carmel, Salinas, and Pajaro) were flooded and untreated sewage was released into the rivers. The amount of untreated sewage released could not be confirmed, but it may have been many thousands of gallons. Major treatment plants affected included Carmel Ranch, Watsonville, King City, Soledad, and Gonzales.
- Gas and electric service provided by Pacific Gas and Electric were affected by the storm, resulting in serious disruptions in service to widespread areas.
- Many public facilities and services were closed or interrupted, including public schools in affected communities.
- Zmudowski State Beach was closed as a result of the discovery of 27 barrels of potentially hazardous materials on the beach.

February 1998

In February 1998, a series of "El Niño" winter storms hit various parts of California, and particularly Monterey County. Close timing of the rainfall events contributed to intense flooding, in that heavy rain would continually hit ground that was still saturated from the previous rain. An estimated 50 roads and highways were closed or restricted, in most cases due to washouts, landslides, and mudslides.

Figure 4: Carmel River Photo, February 1998

Several communities were evacuated, particularly the entire town of Pajaro near Watsonville, all residents of the Sherwood Lake Mobile Home Park near Carr Lake in Salinas, and portions of Bolsa Knolls and Toro Estates. Drinking water quality warnings remained in effect for certain areas for some time afterward. By the end of the first week of February, at least 6,600 homes and businesses had been without power for varying periods of time. The State Governor declared Monterey County, amongst others, a disaster area. On February 9, 1998, California was again declared a Federal Disaster Area designated due to severe winter storms and flooding (FEMA 1203-DR-CA).

The most significant damage involved landslides and mudslides. In particular, the Las Lomas area experienced severe damage of eight residential parcels. Monterey County acquired the parcels

through the Federal Hazard Mitigation Grant Program and all structures were removed. Each parcel was subsequently rezoned to "open space" in perpetuity.

Countywide losses resulting from the February 1998 events are estimated at over $38 million, with agricultural-related losses specifically totaling over $7 million and involving approximately 29,000 damaged acres.

4.2 Recent Flood Events (2000's)

January 2008

A strong coastal storm in January 2008 that brought flooding rains, high winds, record high surf, and coastal flooding to Monterey County and resulted in nearly $1 million in property damages. Two additional RL Properties were created as a result of this event. Approximately 30 homes in the Carmel Lagoon area were affected by some degree of flooding.

October 2010

A strong low pressure system made its way through Central California and led to record-breaking heavy rains across the area, causing an estimated $200,000 in damages. In Salinas, the Pacific Coast Christian Academy and Little Lamb Preschool were flooded after Santa Rita Creek breached its banks.

March 2011

A series of systems affected Monterey County with heavy rain and strong winds causing an estimated $1 million in property damages. Nearly 1,300 acres of crops or croplands were impacted by flooding from the Salinas River and its tributaries causing an estimated $1.5 million in losses.

December 2014

The unincorporated community of Bolsa Knolls along Santa Rita Creek was flooded when a nearby levy broke open. Emergency crews said homes on Paul Avenue and Russell Road where evacuated and more than 18 inches of water flooded homes in a short amount of time.

4.3 History and Update on Disasters in Monterey County

Since 1953, Monterey County has experienced a total of 19 federal disaster declarations as listed in table 2.[7] The disasters listed are from all hazard types. The tsunami that occurred on April 18, 2011 is the only federal disaster declared since the last FMP was adopted in January of 2009. It created a large and rapid change in water level (up to 7 feet) at Moss Landing causing large volumes of water to rush in and out of the north and south harbor area. This ebbing and flowing combined with large sediment transport resulted in shear stresses on dock structures in the harbor. This tsunami caused approximately $2.5 million in damages to 209 timber piles.

[7] Source: MJHMP, 09/2014.

Table 2: Federal Disaster Declarations for Monterey County, 1953 to present			
Declaration Date	Incident Type	Declaration Type	Description
4/18/2011	Tsunami	Major Disaster	Tsunami Waves
7/4/2008	Fire	Fire Management	Basin Fire Complex
6/28/2008	Fire	Emergency	Wildfires
3/13/2007	Freezing	Major Disaster	Severe Freeze
9/13/2005	Hurricane	Emergency	Hurricane Katrina Evacuation
2/9/1999	Freezing	Major Disaster	CA - Citrus Crop Damage 2/2/99
2/9/1998	Severe Storm(s)	Major Disaster	Severe Winter Storms, and Flooding
1/4/1997	Severe Storm(s)	Major Disaster	Severe Storms, Flooding, Mud and Landslides
3/12/1995	Severe Storm(s)	Major Disaster	Severe Storms, Flooding Landslides, Mud Flow
1/10/1995	Severe Storm(s)	Major Disaster	Severe Storms, Flooding, Landslides, Mud Flows
2/3/1993	Flood	Major Disaster	Severe Storm, Mud & Landslides, and Flooding
2/11/1991	Freezing	Major Disaster	Severe Freeze
10/18/1989	Earthquake	Major Disaster	Loma Prieta Earthquake
7/18/1985	Fire	Major Disaster	Grass, Wildlands, & Forest Fires
2/9/1983	Coastal Storm	Major Disaster	Coastal Storms, Floods, Slides & Tornadoes
2/15/1978	Flood	Major Disaster	Coastal Storms, Mudslides & Flooding
1/20/1977	Drought	Emergency	Drought
1/26/1969	Flood	Major Disaster	Severe Storms & Flooding
1/2/1967	Flood	Major Disaster	Severe Storms & Flooding

5. Monterey County Hazard Identification and Risk Assessment

This chapter focuses on describing flood hazards as they exist in the County and building upon information presented in the MJHMP. The MJHMP included a qualitative examination of the vulnerability of important facilities and infrastructure associated with various communities in the County including unincorporated Monterey County. The MJHMP also reviewed the history of disasters in the County and assessed the needs through a comprehensive flood mitigation strategy. The hazard identification and risk assessment in this FMP is intended to identify the types of flooding the County is vulnerable to, specifically in those geographic areas with a high occurrence of FEMA-defined RL Properties.[8]

5.1 Definition of Flood

A flood is defined as an overflowing of a large amount of water beyond its normal confines, especially over what is normally dry land. Floodplains are the low, flat, periodically flooded lands adjacent to rivers, lakes, and oceans that are subject to these water flows. Most injury and death from floods is a result of people being swept away by high-velocity flood currents, and property damage typically occurs as a result of inundation of sediment-laden water. Floods are often described in terms of their extent (including the horizontal area affected and the vertical depth of floodwaters) and the related probability of occurrence.[9]

5.2 Flood Hazard Risk

The major Special Flood Hazard Areas (SFHAs) within the County include areas adjacent to the Salinas, Carmel, Pajaro, and Arroyo Seco rivers, the Moro Cojo and Elkhorn Sloughs, and low-lying coastal areas that are inundated by wave attack[10]. The most common types of flooding in Monterey County are riverine flooding and coastal flooding. FEMA has depicted areas vulnerable to flooding on Flood Insurance Rate Maps (FIRMs), which were development through the NFIP. Figure 5 shows the areas in Monterey County subject to the 1% annual chance flood, also known as the 100-year flood.

5.3 Flood Insurance Rate Maps and Monterey County Flood Maps

A FIRM is an official map of a community on which FEMA has delineated the applicable SFHA. FEMA is the federal agency responsible for producing FIRMs. For over two decades flood hazard identification was performed by the MCWRA staff using paper FIRMs. These paper FIRMs were used for purpose of public information and land use regulation. In 2009, flood hazard identification technology became available for Monterey County through the federal effort known as FEMA Flood Map Modernization (Map Mod). Map Mod created a Digital Flood Insurance Rate Map (DFIRM) containing the same flood hazard information, but in a format able to deliver better quality and reliability than the paper FIRMs. As a result of Map Mod, the MCWRA staff and other local officials can easily view and analyze flood hazard information in the form of DFIRMs using ArcGIS software.

---

[8] A "repetitive loss property" is one for which two flood insurance claim payments of at least $1,000 have been paid by the NFIP within any 10-year period since 1978 (e.g., two claims during the periods of 1984-1993, 1985 – 1994, etc).
[9] Source: MJHMP, 9/2014.
[10] Source: MJHMP, 9/2014.

Paper maps are no longer used, as all flood hazard identification is performed through the use of DFIRMs. DFIRMs include layers such as base map data (streets, orthophotos, etc), base flood elevations, cross-sections with letter identifiers, floodway boundaries, and Letters of Map Change.

Figure 5: Monterey County FEMA-Defined Special Flood Hazard Areas

5.4 Monterey County Flood Insurance Study

On April 2, 2009, FEMA officially released a new effective Flood Insurance Study (FIS) which included corresponding paper FIRMs and DFIRMs for Monterey County. The new release included incorporation of multiple updated hydrologic and hydraulic analyses which were completed in the 2000's for the Carmel River, San Benancio Gulch, Harper Creek, Calera Creek, Watson Creek, and El Toro Creek. The elevations on the new effective FIS, FIRMs, and DFIRMs are now referenced to the North American Vertical Datum of 1988 rather than the National Geodetic Vertical Datum of 1929.

5.5 Vulnerable Structures

The MJHMP included an analysis of the natural hazards (flood, earthquake, wildfire, etc.) that threaten all or portions of the county. The MJHMP also provides an assessment of the county's vulnerability to each type of hazard. The MJHMP was prepared by AECOM through the efforts of participating jurisdictions, various stakeholders and members of the public, and with support of NOAA, NACo, FEMA, and Cal OES. The flood related vulnerability risk is summarized below.

1% Annual Chance Flood: Appropriately 18,819 people (5 percent of the total population), 4,886 residential buildings (worth $949 million), 607 non-residential buildings (worth $876 million), and 19 critical facilities (worth $896 million) are exposed to flooding countywide. The MJHMP did not distinguish between how many buildings and facilities were solely located in unincorporated Monterey County. The MCWRA estimates 90% of the flood vulnerability described above is to people and buildings located in the unincorporated areas of Monterey County. This estimate is based on NFIP data provided to the MCWRA by the FEMA iService Team/NFIP Bureau and Statistical Agent.

Dam Failure: A dam failure could result from a significant seismic event or landslide that may or may not be seismically induced. A dam failure is not likely, but is a possibility. Four major dams and reservoirs, as well as several small dams, are located in and within the vicinity of Monterey County. The four largest dams, the Nacimiento Dam, the San Antonio Dam, the San Clemente Dam, and the Los Padres Dam, have never failed or been subject to significant damage. However, Lake Nacimiento (Nacimiento Dam) has spilled over three times (1958, 1969, and 1983) over the last 50 years, and Lake San Antonio (San Antonio Dam) has spilled twice (1982 and 1983) over the past 40 years.[11] There is no record of any damages, fatalities, or injuries associated with dam failure in unincorporated Monterey County. The MJHMP contains a significant amount of information regarding the potential for dam failure and can be referenced for more details.

5.6 Repetitive Loss Property Vulnerability

This section identifies the 109 RL Properties throughout unincorporated Monterey County and the flooding sources impacting each of these specific properties. Flooding depths and velocities are provided for some of these flooding sources. Table 4 includes a flood hazard summary for each RL Property. The FMP 2014 Update defines 13 RL Areas. These RL Areas contain a total of 1,311 properties which are subject to the same flood risk as the 109 RL Properties. Maps showing the location of each of the 13 unincorporated Monterey County RL Areas are included in Appendix A.

[11] Source: MJHMP, 9/2014.

Hydrologic and hydraulic information, as well as travel times, for select streams are provided in Appendix B.

Big Sur River RL Area: The Big Sur River watershed area is 60.78 square miles (DWR, 1971). Water from the upper basin is funneled through the Big Sur Gorge in the eastern portion of Pfeiffer-Big Sur State Park.

The Big Sur River average annual runoff, for the twenty-seven year period between 1950 and 1977, is 64,900 acre feet based on USGS stream gage records (Vita, 1980). The greatest mean runoff occurs in January when it is more than 240 cfs. The maximum recorded stream discharge was 7,100 cfs recorded on April 2, 1958.

A USGS stream gage is located on the Big Sur River just below the gorge in Pfeiffer-Big Sur State Park. More precisely, it is located next to the abandoned bridge abutment in Weyland Camp approximately 0.4 miles upstream from the mouth of Post Creek. Prior to October 1, 1951, the gage was located 0.9 miles downstream.

Calera Creek RL Area: The Calera Creek watershed is located 10 miles south of Salinas. The two main branches of the stream, known individually as Calera and Watson Creeks, originate on the slopes of Mt. Toro in the Coast Range. The two branches meet near the intersection of Robley and Calera Canyon Roads, and Calera Creek continues north 2.9 miles to its confluence with San Benancio Gulch near Highway 68. Downstream of this confluence, Calera Creek becomes El Toro Creek. Elevations in the Calera Creek watershed vary from 3,560 feet at Mt. Toro to 220 feet at the confluence with San Benancio Gulch. Along the upper reaches, Calera Creek has fairly steep channel slopes and is confined in steep-sided canyons. Downstream of its confluence with Watson Creek, the stream slope flattens and enters a relatively broad valley.

In 2004, FEMA updated the detailed study along Calera Creek and performed a new detailed study along a portion of Watson Creek that was previously designated as Zone A. The study extends upstream along Calera Creek about 4.49 miles. The study also includes approximately 3.95 miles of Watson Creek, beginning at the confluence with Calera Creek. In addition to these updates, the upper 1,065 feet of El Toro Creek was restudied. The 100-year flooding velocities for Calera Creek range from 1.8 to 12.0 feet per second. The drainage area and peak discharge, at select locations, are provided in Appendix B.

Carmel Highlands Coastal Flooding RL Area: The RL Property in Carmel Highlands is located within Zone X, defined as an area outside the 0.2-percent annual chance floodplain, as shown on the FEMA FIRM. The property is located high above the Pacific Ocean on a coastal bluff. Through communication with the property owner, the MCWRA staff determined that the structure was flooded by wind and wave action. There is no information available regarding wave run-up, storm surge, or warning times.

Carmel River RL Area: The Carmel River rises in the California Coast Range of mountains and has a total length of about 35 miles. The entire drainage basin is located on the western slopes of the Sierra De Salinas Range. The watershed rises about 3,500 feet above sea level. The upper reaches

flow northwesterly, generally following the trend of the fault block structure of the Coast Range, to confluence with a major tributary, Tularcitos Creek at river mile 15.7. From this point the lower reach flows in a more westerly direction through Carmel Valley and into the Pacific Ocean at Carmel Bay, just south of the City of Carmel. Average annual precipitation varies from 17 inches in the lower reaches to over 40 inches in the upper tributaries at the higher elevations.

The river drains an area of 255 square miles. Level areas are confined mainly to the lower 16 miles of the basin, known as Carmel Valley, where the valley floor widens to approximately one-half mile. The average gradient of the upper reach from the source to the confluence with Tularcitos Creek is about 320 feet per mile and the stream is actively eroding its bed. Valley trenching is particularly evident in the Tularcitos and Cachagua Creek subwatersheds. The average gradient of the lower reach through Carmel Valley is only about 40 feet per mile. In portions of the downstream reach, the valley is braided with discordant channels and evidence exists that the river has meandered considerably over the floodplain in the recent geological past.

Flood damage in Carmel Valley is caused by inundation of the floodplain and erosion due to high velocity flows at bends in the river. The 100-year flooding velocities for the Carmel River range from 3.0 to 10.8 feet per second. The drainage area and peak discharge, at select locations, are provided in Appendix B.

Carneros Creek RL Area: The 100-year flooding velocities for Carneros Creek range from 0.1 to 10.2 feet per second according to the FEMA Flood Insurance Study (FIS). The drainage area and peak discharge, at select locations, are provided in Appendix B.

RL Property No. 96 is located approximately 0.25 miles downstream from the intersection of San Miguel Canyon Road and Carneros Creek. Figure 6 was taken looking upstream toward San Miguel Canyon Road.

Figure 6: Carneros Creek at San Miguel Canyon Road, July 1998.

Castroville Boulevard Wash RL Area: The drainage area for Castroville Boulevard Wash is 3.5 square miles at Elkhorn Road, and the 100-year peak discharge is 125 cfs at this location. According to the FIS, flooding velocities range from 0.7 to 7.8 feet per second.

El Toro Creek RL Area: With a watershed area over 41 square miles, El Toro Creek lies west of the Salinas River along Highway 68. The confluence with the Salinas River is just north of State Highway 68 east of Reservation Road. Elevations within the watershed range from 3,560 feet at Mount Toro to 50 feet at the Salinas River. As provided in the FIS, 100-year flooding velocities

range from 4.3 to 8.8 feet per second. The drainage area and peak discharge, at select locations, are provided in Appendix B.

Most of the higher areas are mountainous with slopes averaging about 50 percent. They are penetrated by narrow alluvium filled valleys. Moving downstream toward Highway 68, these valleys widen and have more gentle slopes. The lowest portion of the watershed includes the El Toro Creek floodplain, which is the most highly urbanized area.

Figure 7: El Toro Creek, August 2002

Most of the mountainous region is brush-covered, especially those parts facing south and west. However, there is forest on those portions of the watersheds receiving more rain and having shady slopes. In certain areas the soil is granular and highly permeable, infiltrating a significant amount of precipitation. Large amounts of sediment and debris were deposited in the stream channel during the 1995 and 1998 floods resulting in increased flooding on lower El Toro Creek. The above photo, Figure 7 was taken several hundred feet downstream from Creekside Condominiums looking downstream.

Pajaro River: Although there are no RL Properties along the Pajaro River, there has been historical flooding that has damaged many properties. The Pajaro Valley drainage basin separates the southern Santa Cruz Mountains to the north from the Gabilan Range to the south and extends east to the California Coast Range of mountains. The Pajaro River is the largest stream in the Pajaro Valley, draining approximately 1,190 square miles above the gage at Chittenden. Streams tributary to the Pajaro River include the Corralitos, Salsipuedes, Brown's Valley, Green Valley, Casserly, and Pescadero Creeks, which drain the southern slopes of the Santa Cruz Mountains. Tributaries to the Pajaro River that are outside of the Pajaro Valley include the Uvas and Llagas Creeks (draining the eastern slope of the Santa Cruz Mountains), Pacheco Creek, and the San Benito River in San Benito County. The river ultimately

Figure 8: Pajaro River near Gonda Street, March 2011.

flows into the Pacific Ocean at Monterey Bay, just south of the City of Watsonville. The drainage area and peak discharge, for select locations, are provided in Appendix B.

Flood damage in Pajaro Valley is caused by the overtopping or destruction of levees resulting in inundation of the floodplain. As provided in the FIS, 100-year flooding velocities range from 1.4 to 10.5 feet per second. The two largest floods on the Pajaro River occurred in 1955 and 1958. The associated discharges on the Pajaro River for these events were 24,000 cfs and 23,500 cfs, respectively, at the USGS Chittenden gage. The estimated return periods for these floods are 27 years and 26 years, respectively. Another severe flood occurred in March 1995, estimated to be a 10-20 year storm event, caused by a breach in the levee approximately 3 miles upstream of the town of Pajaro. The drainage system in the flat town could not adequately discharge the stormwater runoff in the streets. This resulted in mass evacuations and damage to private property. All residences (600+) and businesses in Pajaro were damaged and 2,500 people (out of a total population of 5,000) were evacuated. The peak flow travel times at the USGS Chittenden gage are provided in Appendix B.

Figure 9: Shallow flooding at the Pajaro River Levee near Gonda Street , March 2011.

Paloma/Piney Creek RL Area: A small portion of Paloma Creek, a tributary to Piney Creek, was identified as a SFHA on the effective FEMA FIRM. The floodplain boundaries were delineated using approximate methods; therefore, a floodway was not defined and flooding elevations were not provided. No information is available regarding flooding depths, velocities, or warning times. RL Property No. 100 is located approximately 500 feet upstream of the study limits in Flood Zone X. Piney Creek, a tributary to the Arroyo Seco River, is a perennial stream located southwest of Greenfield in southern Monterey County. The floodplain boundaries were delineated using approximate methods; therefore, a floodway was not defined and no flooding elevations were provided. No information is available regarding flooding depths, velocities, or warning times. RL Property No. 103 was located within the SFHA; however, it was demolished in 1995 due to severe flood damage.

Pebble Beach Localized Flooding RL Area: There are two RL Properties in Pebble Beach, and both are located within Zone X as shown on the FEMA FIRM. There are no perennial or intermittent streams nearby. Through communication with residents and the Pebble Beach Company, the MCWRA staff concluded that clogged drainage facilities resulted in localized flooding. There is no information available regarding flooding depths, velocities, or warning times.

Ralph Lane RL Area: A drainage channel meanders across eleven residential lots located on Ralph Lane, east of Highway 101, approximately three miles north of the City of Salinas, in northern Monterey County. RL Property No. 104 was one of several houses damaged during the January 1997 floods (FEMA Disaster 1155). Figure 10 was taken from the Ralph Lane Bridge looking downstream. Figure 11 was taken at the downstream end of the concrete channel shown in the prior figure.

Figure 10: Ralph Lane Channel, January 1998.

Figure 11: Ralph Lane Channel, January 1998.

Salinas River: The Salinas River headwaters are in the mountain regions of coastal San Luis Obispo County and extends approximately 155 miles northwest to the Pacific Ocean at Monterey Bay, just north of the City of Marina. The drainage basin is bounded by the Gabilan and Diablo Ranges on the east and the Sierra de Salinas and Santa Lucia Range on the west. The valley floor, which is ten to twenty miles wide, has soils that are rich, alluvial deposits used primarily for agriculture. The drainage area at Spreckels is 4,156 square miles making it the largest watershed in Monterey County.

Major tributaries to the Salinas River include the Nacimiento River at river mile 105.8, the San Antonio River at river mile 101.2, and the Arroyo Seco River at approximately river mile 45.5. San Lorenzo Creek, another significant tributary to the Salinas River, flows from the Gabilan Mountains and joins the Salinas River in the King City area at river mile 68.8. Average annual precipitation varies from 10 inches in the lower reaches to over 75 inches at the higher elevations. The Nacimiento and San Antonio Dams, previously described, provide flood protection along the Salinas River.

There are no repetitive loss properties along the Salinas River. The land adjacent to the river is primarily agricultural, and the city centers are located further away from the river. The drainage area and peak discharge, for select locations, are provided in Appendix B. The 100-year flooding velocities for the Salinas River range from 1.9 to 11.5 feet per second. The travel times at select locations are provided in Appendix B.

San Miguel Canyon Creek RL Area: The 100-year flooding velocities for San Miguel Canyon Creek range from 1.2-9.8 feet per second. The drainage area and peak discharge, at select locations, are provided in Appendix B. There is no flood warning time information available for this area.

Santa Rita Creek RL Area: Santa Rita Creek drains approximately 13.7 square miles and discharges into the Reclamation Ditch along Highway 183. The furthest upstream point of the Santa Rita Creek watershed is about twelve miles above the Reclamation Ditch. The watershed's width varies from 2,000 to 9,000 feet and elevations range from sea level to 500 feet.

The 100-year flooding velocities for Santa Rita Creek range from 1.3 to 5.1 feet per second. The drainage area and peak discharge, at select locations, are provided in Appendix B. There is no flood warning time information available for this area.

5.7 Additional Natural Hazards

Tsunami Hazard Areas: Tsunamis are large seismic sea waves, typically induced by a rapid, vertical thrust along the subsurface fault line between two tectonic plates of the earth's crust. Also, when a large mass of earth on the ocean bottom impulsively sinks or uplifts, the column of water directly above it is displaced, forming a tsunami wave on the surface. Volcanic activity and submarine landslides (sometimes the result of earthquakes) can also cause tsunamis. Local authorities are responsible for formulating and executing evacuation plans. Currently, emergency procedures for tsunamis are outlined in the MJHMP.

Geologic Hazards: *Subsidence.* The primary causes of most subsidence are human activities: underground mining of coal, groundwater or petroleum withdrawal, and drainage of organic soils. Regional lowering of land elevation occurs gradually over time. It may aggravate flooding potential, particularly in coastal areas. Collapses, such as the sudden formation of sinkholes or the collapse of an abandoned mine, may destroy buildings, roads, and utilities. Generally, subsidence poses a greater risk to property than to life. Damage usually consists of direct structural damage and property loss and depreciation of land values, but also includes business and personal losses that accrue during periods of repair. *Landslides.* Landslides are often triggered by other natural events such as floods, earthquakes, and volcanic eruptions. Other human factors contributing to landslides are cut-and-fill, construction of highways, construction of buildings and railroads, and mining operations. According to FEMA's Federal Disaster Declarations website, landslides have resulted in 99 disaster declarations from 1978 to 2013. Of those, 17 were located in California. Landslides and mudflows are common events in California because of active mountain-building processes, rock characteristics, earthquakes, and intense storms. There are also human factors that may contribute to or influence landslides. The principal human factors are mining and construction of highways, buildings, and railroads. The principal natural factors are topography, geology, and precipitation.

Seismic Hazard: *Earthquakes.* Monterey County is located in a seismically active area. However, the maximum anticipated earthquake for this area has not been experienced. The largest threat from earthquakes is the damage or collapse of buildings or infrastructure (dams, bridges, overpasses, roads, railways, and water, power, and communication lines).

Atmospheric Hazards: *Thunderstorms and Lighting.* These events are generated by atmospheric imbalance and turbulence due to the combination of (1) unstable warm air rising rapidly into the atmosphere; (2) sufficient moisture to form clouds and rain; and (3) upward lift of air currents caused by colliding weather fronts (cold and warm), sea breezes, or mountains. The number one cause of deaths associated with thunderstorms is flashfloods. Lightning-induced fires can also result from thunderstorm activity. *Tornadoes*. A tornado is a rapidly rotating vortex or funnel of air extending toward the ground from a cumulonimbus cloud. Most of the time, vortices remain suspended in the atmosphere. When the lower tip of the vortex touches earth, the tornado becomes a force of destruction. Other hazards that accompany weather systems that produce tornadoes include rainstorms, windstorms, large hail, and lightning. *Severe Winter Storms.* This phenomenon consists of the large winter storms that bring widespread rainfall to the region. These storms are different than typical thunderstorms in that they produce significant rainfall over a large portion of the region and can last for several days. Severe winter storms are associated with other natural hazards, such as coastal flooding and erosion, thunderstorms, tornadoes, and extreme winds. The 100-year event that defines the SFHAs would most likely result from an extended duration severe winter storm.

Fire Hazard: *Wildfires.* There are four categories of wildfires that are experienced throughout the United States:

- Wildland fires are fueled by natural vegetation (i.e., national forests and parks).
- Interface or Intermis fires are urban/wildland fires in which vegetation and the built-environment provide fuel.
- Firestorms are events of such extreme intensity that effective suppression is virtually impossible. Firestorms occur during extreme weather and generally burn until conditions change or the available fuel is exhausted.
- Prescribed fires and prescribed natural fires are fires that are intentionally set or selected natural fires that are allowed to burn for beneficial purposes.

The U.S. Forest Service reports that nationwide, more than 75,000 wildfires are reported each year, 90% of which are caused by arson. Other ignition sources include debris burns and lightning. Lightning can present particularly difficult problems when dry thunderstorms move across an area that is suffering from seasonal drought. Watershed areas burned by wildfires create a potential threat to downstream areas. In the event that above-normal rainfall falls over burned watersheds, extensive damage to property from water, mud and water-carried debris could occur in the burned and downstream areas.

6. Prevention Measures

Preventive activities keep flood problems from getting worse. The use and development of flood-prone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, code enforcement, and/or flood control district offices and include:

- Floodplain mapping and data
- Open space preservation
- Floodplain regulations
- Coastal setback/erosion regulations
- Planning and zoning
- Stormwater management
- Drainage system maintenance
- Building codes

6.1 Current Prevention Measures

Monterey County contains some of the highest percentages of land area located in the 100-year floodplain compared to other counties in the State of California. County officials recognize the importance of protecting citizens from flood hazards and other natural disasters. These regulations are usually administered by building, zoning, planning, code enforcement, and/or flood control offices, and include open space preservation, floodplain regulations, coastal setback regulations, planning and zoning, and stormwater management. Since 1983, the Monterey County BOS has adopted various plans and ordinances which address and reduce the community's vulnerability to floods.

6.1.1 General Plan

2010 Monterey County General Plan is the most recent Monterey County General Plan, adopted October 26, 2010, and identifies goals which strengthen all aspects of the County's floodplain management program. These goals are found throughout the General Plan in sections related to Land use, Open Space, Safety, Public Services, and Agricultural, and include:

- Goal LU-7: Encourage the use of the County's major inland water bodies for multiple purposes, such as water supply, flood control, and hydroelectric generation.
- Goal LU-8: Encourage the provision of open space lands as part of all types of development including residential, commercial, industrial, and public.
- Goal OS-3: Prevent soil erosion to conserve soils and enhance water quality.
- Goal OS-4: Protect and conserve the quality of coastal, marine, and river environments, as applied in areas not in the coastal zone.
- Goal OS-5: Conserve listed species, critical habitat, habitat, and species protected in area plans; avoid, minimize, and mitigate significant impacts to biological resources.
- Goal S-2: Reduce the amount of new development in floodplains and, for any development that does occur, minimize the risk from flooding and erosion.

- Goal S-3: Ensure effective storm drainage and flood control to protect life, property, and the environment.
- Goal PS-6: Ensure the disposal of solid waste in a safe and efficient manner.
- Goal PS-11: Maintain and enhance the County's parks and trails system in order to provide recreational opportunities, preserve natural scenic resources and significant wildlife habitats, and provide good stewardship of open space resources.
- Goal AG-1: Promote the long-term protection, conservation, and enhancement of productive and potentially productive agricultural land.
- Goal AG-5: Ensure capability between the County's agricultural uses and environmental resources.

The link to the 2010 Monterey County General Plan is provided here:
http://www.co.monterey.ca.us/planning/gpu/gpu_2007/2010_mo_co_general_plan_adopted_102610/Elements_Area-_Master_Plans/04-Safety%20Element_10-26-2010.pdf

6.1.2 Zoning

MCC Chapter 21.64.130, Regulations for Land Use in the Carmel Valley Floodplain includes additional floodplain regulations for land use in the Carmel River floodplain. The Monterey County BOS adopted these floodplain regulations for Carmel Valley in 1983. These regulations pre-date the County joining the FEMA NFIP in 1984. This zoning ordinance regulates development and existing uses in and near the 100-year floodplain of the Carmel River throughout the Carmel Valley. The objective of the regulation is to:

- protect the Carmel River and its corridor including visual aspects, value as wildlife habitat, and stabilize the river channel;
- preserve the rural character of Carmel Valley; and,
- promote public health and safety by lessening local flood potential and flood-related hazards.

The link to the Chapter 21.64.130 is provided here:
http://www.mcwra.co.monterey.ca.us/ordinances/documents/floodplain/Carmel%20Valley%20Floodplain%20Zoning_Title%2021%2021.64.130.pdf

6.1.3 Floodplain Construction Standards

MCC Chapter 16.16, Regulations for Floodplains in Monterey County became part of MCC in 1984, when Monterey County adopted ordinance no. 2966, which amended Chapter 16. As a requirement for continued participation in the NFIP, MCC Chapter 16.16 was again amended in October 2009. The update included new definitions and standards outlined in Title 44 of the Code of Federal Regulations. The amendments to MCC Chapter 16.16 included:

- revised definitions;
- designation of a Floodplain Administrator; and,
- clarification of regulations for permit proposals including subdivisions and new development greater than 50 lots or 5 acres, manufactured homes, recreational vehicles, garages, low cost accessory structures, and substantial improvements.

MCC Chapter 16.16, Regulations for Floodplains in Monterey County promotes public health, safety, and general welfare, and minimizes public and private losses due to flood conditions in specific areas by provisions designed to:

- protect human life and health;
- minimize expenditure of public money for costly flood-control projects;
- minimize the need for rescue and relief efforts associated with flooding;
- minimize prolonged business interruptions;
- minimize damage to public facilities and utilities located in SFHAs;
- help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future blight areas;
- ensure that potential buyers are notified that property is in an area of special flood hazard;
- ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

The link to MCC Chapter 16.16 is provided here:
http://www.mcwra.co.monterey.ca.us/ordinances/documents/floodplain/5139_Monterey%20County%20Floodplain%20Management%20(2009).pdf

6.1.4 Stormwater & Urban Runoff Regulations

MCC Chapter 16.14, Urban Stormwater Management and Discharge Program became part of MCC in 2010 when Monterey County adopted ordinance no. 5154, which amended Chapter 16. These requirements were adopted to comply with the Clean Water Act, the Porter-Cologne Act and the State Stormwater General Permit legislation overseen by the California EPA, the State Water Board, and the respective Regional Water Quality Control Boards. MCC Chapter 16.14 established urbanized area boundaries and best management practices strategies required to be implemented on development projects. If a project is located in an "urbanized area" the requirements include provisions to mitigate any impacts to water quality as a result of the project.

The link to MCC Chapter 16.14 is provided here:
http://www.mcwra.co.monterey.ca.us/ordinances/documents/land_use_review/5154_Storm%20Drain%20Discharges%20(2010).pdf

Additionally, on 7/12/2013, the Central Coast Regional Water Quality Control Board (CCRWQCB) adopted regulations for approving post-construction stormwater management requirements for projects on the Central Coast. These regulations apply to any development project located in the MCC Chapter 16.14 urbanized area. The requirements include necessary policies and provisions to mitigate impacts to water quality and post-development peak flow runoff.

More information can be found by using the link to the CCRWQCB website found here:
http://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/docs/lid/lid_hydromod_charette_index.shtml

6.1.5 Low-Density Zoning

MCC Chapter 21.16 and 21.30, Rural Density Residential Zoning Districts or "RDR" Districts and Farmlands Zoning Districts or "F" Districts is part of the Monterey County Zoning Ordinance Title 21 for Inland Areas. The purpose of these chapters is to provide a district to accommodate rural density and intensity use in the rural and suburban areas of Monterey County, and to preserve and enhance the use of the prime, productive, and unique farmlands in Monterey County, while supporting necessary development and facilities. Nearly 75% of the County's SFHAs are under the "RDR" and "F" designations and regulations. The County's was able to earn 499 credits points during the most recent CRS cycle audit due solely to the way "RDR" and "F" zoning minimizes development in the SFHA. This amount of points is nearly enough to improve an entire CRS Class rating (i.e., Class 8 to Class 7).

The link to Title 21 which contains Chapters 21.16 and 21.30 is provided here:
http://www.co.monterey.ca.us/planning/docs/ordinances/Title21/Title21_Rev_012809.pdf

7. Property Protection

Property protection activities are usually undertaken by property owners on a building-by-building or parcel basis, and include:

- Relocation
- Acquisition
- Building elevation
- Retrofitting
- Sewer backup protection
- Insurance

7.1 FEMA Flood Mitigation Assistance Grants

FEMA's Flood Mitigation Assistance (FMA) Grant Program provides funds to property owners to reduce or eliminate risk of flood damage to buildings that are insured under the NFIP on an annual basis. FMA funding can be used to encourage private property owners to implement measures to reduce flood losses, such as elevating, acquiring, or relocating of NFIP-insured structures. The FMA Grant Program was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 with the goal of reducing or eliminating claims under the NFIP.

In July 2013, the Biggert-Waters Reform Act of 2012 (BW-12) changed the FMA Grant Program to allow more federal funds for properties with repetitive flood claims and severe repetitive loss properties. BW-12 includes measures that ultimately bring all SRL property premiums to actuarial rates over time under the Unified Hazard Mitigation Assistance (HMA) guidance. This new legislation may cause more SRL property owners to mitigate, with or without federal funding.

FMA applications and sub-applications are submitted by states on behalf of local communities via the Mitigation eGrants system on the FEMA Grants Portal: http://portal .fema.gov. FMA applications then undergo a complete eligibility review within their respective FEMA Region. FEMA will perform a technical review of the project sub-applications for each eligible applicant focusing on two areas: (1) benefit-cost analysis, and (2) engineering feasibility.

For the FMA program, FEMA may contribute funding to eligible projects as follows:

- Up to 100% federal cost share for SRL properties;
- Up to 90% federal cost share for Repetitive Loss (RL) Properties; and
- Up to 75% federal cost share for NFIP-insured properties.

Residential or non-residential properties currently insured with the NFIP are eligible to receive these FMA funds. Property owners who are interested in obtaining an FMA grant should contact the MCWRA for more information.

7.2 Flood Insurance

It is recommended that all property owners obtain flood insurance which is available for insurable buildings and their contents. Renters can take out a policy with contents coverage, even if there is no structural coverage.

On June 1, 1997, the NFIP began offering additional coverage to all holders of structural flood insurance policies. This coverage is called Increased Cost of Compliance (ICC). The name refers to cases where the local floodplain management ordinance requires elevation or retrofitting of a substantially damaged building. Under ICC, the flood insurance policy will not only pay for repairs to the flooded building, it will pay up to $30,000 to help cover the additional costs required to comply with local floodplain regulations. This is available for any flood insurance claim; therefore, it is not dependent on the community receiving a disaster declaration. Those insured under the Group Flood Insurance Policy and insured with condominium unit owner's coverage are not eligible for ICC coverage, nor are policies issued or renewed in Emergency Program communities. All other policies include the coverage.

There are four options covered by ICC that policy holders can chose to comply with local floodplain regulations and help reduce future flood damage:

- Elevation: this raises your home or business to or above the flood elevation level adopted by your community.
- Relocation: this moves your home or business out of harm's way.
- Demolition: this tears down and removes flood-damaged buildings.
- Floodproofing: this option is available primarily for non-residential buildings. It involves making a building watertight through a combination of adjustments or additions of features to the building that reduce the potential for flood damage.

An ICC is covered in two instances:

- *If the community determines that the home or business* is damaged by flood to the point that repairs will cost 50 percent or more of the building's pre-damage market value. This is called substantial damage.
- *If the community has a repetitive loss provision* in its floodplain management ordinance and determines that the home or business was damaged by a flood two times in the past 10 years, where the cost of repairing the flood damage, on the average, equaled or exceeded 25 percent of its market value at the time of each flood. This is called repetitive damage. Additionally, there must have been flood insurance claim payments for each of the two flood losses.

ICC claims will only be paid on flood-damaged homes and businesses, and can only be used to pay for costs of meeting the County's floodplain management ordinance.

8. Natural Resources Protection

Natural resources protection activities can preserve or restore natural areas and the natural functions of floodplain and watershed areas. These activities in turn produce flood loss reduction benefits as well as improvements to water quality and riparian habitats. Natural resources protection can be found within countywide zoning and open space preservation regulations. Various departments in the County are responsible for the following categories of natural resource protection:

- Wetland protection
- Erosion and sediment control
- Natural area preservation
- Natural area restoration
- Water quality improvement
- Coastal barrier protection
- Environmental corridors
- Natural functions protection

8.1 Natural Resources Protection Efforts

It is important to highlight, the County is not alone in its natural resources protection efforts. There are a dozen or more organizations which coordinate programs related to floodplain restoration, habitat conservation, and land stewardship. These organizations provide numerous benefits to the County by encouraging a citizens-based approach to natural resources protection. In general the public is concerned about human impacts to the natural environment. These community-based organizations provide a framework for people to get involved and explore the development of actions into outcomes. From wetland restoration and stream clean-ups, to native plant restoration and trail building and maintenance, to storm water monitoring and open space preservation, there are numerous organizations in the County where the public can become involved in such efforts. These organizations include, but are not limited to the Monterey Bay National Marine Sanctuary, the Nature Conservancy, USDA Natural Resource Conservation Service, the State of California Coastal Conservancy, Resource Conservation District of Monterey County, the Monterey Peninsula Regional Parks District, the Elkhorn Slough Foundation, the Big Sur Land Trust, the Central Coast Wetlands Group, the Carmel River Steelhead Association, the Salinas River Partners in Restoration, the Sierra Club, the Ventana Wildlife Society, the Monterey Bay Chapter of the California Native Plant Society, California State University Monterey Bay Return of the Natives Project, the Otter Project, MEarth, and more.

8.2 Wetlands Protection

Wetlands are an important natural resource and are often found in floodplains or depression areas in a watershed. Wetlands feed downstream waters, trap floodwaters, recharge groundwater supplies, remove pollutants, and provide fish and wildlife habitat. The Clean Water Act Section 404 established a program to regulate the discharge of dredged and fill materials in waters of the United States, including wetlands. Responsibility for administering and enforcing Section 404 is shared between the U.S. Army Corps of Engineers (USACE) and the Environmental Protection Agency

(EPA). At the state-level, the California EPA conducts Section 401 certification reviews of projects requiring a section 404 permit from USACE. The purpose of these certification reviews is to determine whether a proposed discharge will comply with California water quality standards.

Wetlands and other Environmentally Sensitive Habitat Areas (ESHAs) are sometimes not easy to recognize. Often property owners and developers may not realize they are seeking to do work in a wetland or ESHA. It is the responsibility of staff from the Monterey County Resource Management Agency (RMA) Planning Department to consider, identify, delineate, and protect wetlands and ESHAs as part of a project or construction permit evaluation. Different levels of review (local, state, federal) may be placed on a permit application depending on the findings established by RMA-Planning Department staff. Staff in this department frequently undergo training best manage wetlands and ESHAs.

8.3 Grading and Erosion Control

Stormwater runoff can erode soil, sending sediment downstream into watercourses. This sediment travels downstream and sedimentation gradually fills in channels and watercourses. Water quality can be protected by controlling and minimizing erosion. Erosion control measures are enforced to eliminate and prevent conditions of accelerated erosion that have led to, or could lead to, degradation of water quality, loss of fish habitat, damage to property, loss of topsoil or vegetation cover, disruption of water supply, and increased danger from flooding.

In 1979, Monterey County established grading and erosion control regulations to enforce provisions of the then newly adopted grading and erosion control ordinances [Monterey County Code (MCC) Chapter 16.08 through 16.12]. These ordinances were adopted to safeguard health, safety, and public welfare, and to minimize erosion, protect fish and wildlife, and to otherwise protect the natural environment. The Monterey County RMA-Environmental Services Department is responsible for enforcing all aspects of these ordinances. Erosion control plans, storm water plans, and watershed protection plans are three types of erosion-related plans required for specific projects in Monterey County.

The RMA-Environmental Services Department reviews all construction permits to ensure compliance with ordinance provisions including, but not limited to, building permits and other development to assure compliance with geologic, geotechnical, seismic zone, grading, and erosion control requirements.

8.4 Construction Best Management Practices

Sedimentation has been called the largest source of water pollution in the county. It is important sediment is retained on construction sites so drainage systems do not become choked with eroded soil that have been captured in stormwater. Sediment control is especially important in watesheds where land is being disturbed by construction.

Construction activities in the County are regulated under the Non-Point Discharge Elimination System (NPDES) General Permit for Construction Activities (Construction General Permit) provided that the total amount of ground disturbance during construction exceeds 1 acre. The CCRWQCB enforces the Construction General Permit. The coverage under a Construction General Permit

requires submittal of a notice of intent (NOI) and a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP needs to be prepared by a Qualified SWPPP Developer, also known as a QSD, and contain 1) a site description addressing the elements and characteristics specific to the site; 2) descriptions of best management practices (BMPs) for erosion and sediment control; 3) BMPs for construction waste handling and disposal; 4) methods for implementing approved local plans; 5) proposed post-construction controls, including a description of local post-construction erosion and sediment control requirements; and 6) non stormwater management measures. The Construction General Permit authorizes the discharge of uncontaminated groundwater from dewatering as long as the action does not cause or contribute to a violation of any water quality standards and meets other criteria specified as permit conditions in the permit. In summary projects in the County which involve more than 1 acre of land disturbance are required to obtain coverage under a Construction General Permit and to submit a NOI and SWPPP. The RMA-Environmental Services Department is responsible for ensuring projects comply with these Construction General Permit regulations.

8.5 Dumping Regulations

Debris accidentally or intentionally dumped into channels or wetlands can obstruct even low flows and reduce the system's ability to retain or clean stormwater. Monterey County does have a solid waste collection and disposal ordinance which prohibits the dumping of garbage or other waste on public or private property (MCC Chapter 10.41). These regulations state a person shall not throw or deposit or cause to be thrown or deposited, any refuse upon any premises whatsoever expect at a permitted disposal facility. The Monterey Peninsula Regional Parks District also sponsors a "Keep Monterey County Clean" program.

9. Emergency Services

Emergency services measures are taken during an emergency to minimize its impact. These measures are usually the responsibility of city or county emergency management staff and the owners or operators of major critical facilities. Various departments in the County are responsible for the following categories of emergency services:

- Hazard threat recognition
- Hazard warning
- Hazard response operations
- Critical facilities protection
- Health and safety maintenance
- Post-disaster mitigation actions

9.1 Emergency Storm Response

The Monterey County Office of Emergency Services (OES) coordinates the overall county response to disasters, including floods. OES is responsible for alerting and notifying appropriate agencies during emergency storm response situations, coordinating all agencies that respond, ensuring resources are available and mobilized in time, and developing and providing preparedness materials for the public. In 2008, OES published a Winter Storm Emergency Response Plan in 2008 to address the emergency response to threats of flood and debris flows. This plan details the action of local, state, and federal agencies to prepare for responding to threats to life and property in areas that may be affected by damaging and dangerous storm-induced flooding. More information on emergency storm response can be found on the OES website http://www.co.monterey.ca.us/oes/.

9.2 ALERT Flood Warning System

Monterey County began the installation of one the first ALERT flood warning networks anywhere following the 1977 Marble Cone fire. ALERT (Automated Local Evaluation in Real Time) is a communications protocol that was developed by the National Weather Service in the 1970's. ALERT is a reliable, low-cost method of transmitting environmental data from remote sites to a central database in real time. The MCWRA operates and maintains the current Monterey County ALERT flood warning system. The system consists of approximately 50 remote sites located throughout the major watersheds of Monterey County. These remote sites measure a variety of environmental factors including rainfall, water level, and air temperature that are used to forecast flooding and monitor storm events.

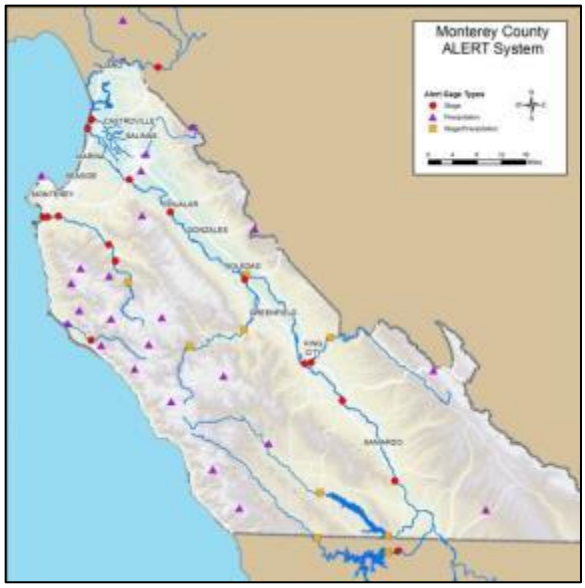


Figure 12: Monterey County ALERT Stations

Data from the ALERT system can be monitored by the MCWRA staff through a secure web-based interface from any computer or mobile device with internet access and a web browser. The modern web-based system, in conjunction with the redundant ALERT radio backbone, allows reliable access to real time hydrologic data in even the worst storm conditions. Data from the Monterey County flood warning system is used to support flood monitoring operations by the MCWRA as well as the National Weather Service and the California Nevada River Forecast Center.

In addition to winter storm monitoring, the flood warning system is used year-round to monitor reservoir releases, and river, reservoir, and lagoon stages as they relate to environmental compliance issues and the operation of the Salinas Valley Water Project.

The MCWRA is currently seeking grant funding from the DWR to upgrade the Flood Warning System from ALERT to ALERT2. The MCWRA took on the role as lead agency in a partnership with the County of Santa Cruz and the Offices of Emergency Services for both Monterey and Santa Cruz Counties and submitted an application for grant funding under the DWR Flood Emergency Response Program. The application, submitted in February 2015, requested total grant funding of $559,060 for the update of the Monterey and Santa Cruz County EOPs and full conversion of both ALERT flood warning systems to the new ALERT2 protocol. The conversion to ALERT2 promises the benefits of more accurate and reliable data transmission, greater flexibility in how data is stored and accessed through upgraded base station hardware and software, as well as compatibility with future FCC radio bandwidth requirements.

The MCWRA and partnering agencies were recommended for funding in the amount of $312,124 with no fund matching requirement. The recommended funding amount is estimated to allow for the update of the EOP, the installation of new computer base station hardware and software, the upgrade of the ALERT radio repeater backbone to ALERT2 for Monterey and Santa Cruz Counties, and the upgrade to ALERT2 of 35% of the individual flood warning sites owned by the MCWRA. The tasks under this grant application will be implemented in a three-year span after funds are received. The upgrade of the remaining 65% of the individual flood warning gages to ALERT2 will occur slowly over time through existing MCWRA funding sources or could be funded through an additional round of DWR grant funding, if offered. The public comment period for funding recommendations was extended through July 25, 2015.

9.3 Dam Safety

In 2014, the MCWRA updated the Emergency Action Plan (EAP) for both the San Antonio and Nacimiento Dams. This plan complements the Monterey County Operational Area Emergency Operations Plan (EOP) and the information is reviewed annually. Included in this review is an evaluation of any changes in the notification flowcharts, watershed, downstream floodplain, or cultural features, which might affect the hazards or risks involved. A pre-planned test (both table-top and functional exercises) is conducted to evaluate the effectiveness of the EAP at least every five years. Either the MCWRA reservoir operator or another will trigger the test in order to test key elements of the chain of notification.

This EAP is to be used during major flooding events along the Nacimiento and Salinas Rivers as a guide for emergency personnel in determining maximum flood water elevations, especially in the

area south of Soledad, and for notifying emergency personnel during any significant flood event or potential emergency situation regarding Nacimiento Dam. Included in the EAP is an inundation map outlining areas of potential inundation if a dam failed completely and suddenly with a full reservoir.

The MCWRA reservoir operator makes daily visual examinations following established procedures. These procedures provide a frequent check on the general appearance and functionality of the dam and appurtenances. The purpose of these examinations is to identify, at the earliest possible time, any readily observable changes. In addition to daily and special examinations by the MCWRA reservoir operator, dam safety professionals with the DWR Division of Safety of Dams (DSOD) make annual inspections. These inspections are carried out in considerably more depth than the daily examinations and are part of the DSOD's continuing program of evaluation of safety of dams within its jurisdiction.

Settlement devices placed in the dams' embankments are surveyed annually. The settlement survey is examined by the MCWRA engineers and submitted to the Federal Energy Regulatory Commission's (FERC) Division of Dam Safety and/or DSOD. Any obvious change in the markers is investigated and can be cause for early corrective action. For Nacimiento Reservoir, engineers from the MCWRA and the FERC formally conduct Potential Failure Mode Analyses (PFMA) every five years. A PFMA is conducted by thoroughly reviewing the available information on the dam and then analyzing through a facilitated discussion the ways in which the dam could potentially fail. This process, part of the Dam Safety Performance Monitoring Program, has been highly successful in providing an improved understanding by all parties of the design and construction, project history, and operation of the project, and how each of these aspects influences potential failure modes for the dam. In addition, the PFMA process results in a focusing of operations and maintenance, surveillance and monitoring activities, investigations, and engineering evaluations on those areas that are deemed critical based on the results of the PFMA. The MCWRA has been conducting PFMA on Nacimiento Reservoir since 1990's.

9.4 Sandbag Inventory and Sand Stockpiles

The MCWRA is responsible for maintaining the County sandbag inventory and distribution to local fire districts in unincorporated areas of Monterey County. The local fire districts distribute the sandbags to the public, free of charge, for use in flood-fighting measures only. Monterey County has two mechanical sandbaggers and a supply of sand pre-staged at select locations. This inventory and the fire station list is updated as required and is available at on the Sandbag Stockpile and Distribution Information tab found on the MCWRA home page:
http://www.mcwra.co.monterey.ca.us

10. Structural Projects

Structural projects keep flood waters away from an area by using a levee, reservoir, or other flood control measure. They are usually designed by engineers and managed or maintained by a flood control district and/or public works department and include:

- Dams and reservoirs
- Levees/floodwalls
- Drainage facilities and diversions
- Storm drain improvements & basins
- Stream, channel, and basin maintenance

The effects of flooding can also be moderated by the dredging of river channels, clearing of debris along riverbanks, and stabilization of riverbanks. Monterey County has utilized structural projects for close to a century to alleviate the impact of flood waters. The intent of this chapter is to discuss the current and future structural projects established in the County for flood control.

10.1 Dams

The MCWRA owns and operates the Nacimiento and the San Antonio Dams. In addition, two dams, San Clemente Dam and the Los Padres Dam are privately owned and operated by California American Water (CAW). The County has a responsible role in ensuring dam safety, as it helps in disseminating general information, maps of potential inundation areas, and proposed evacuation route information to the public.

Nacimiento Dam

Nacimiento Dam and its reservoir, Nacimiento Reservoir, are located in northern San Luis Obispo County, about 20 miles from the coast, in central California. Nacimiento Dam was completed in 1957. This earth-filled dam has a height of 215 feet above the streambed and a crest length of 1,650 feet. The crest elevation is 825 feet above mean sea level (msl) with a spillway elevation of 787.75 feet which can be raised to an elevation of 800 feet by the use of an inflatable Obermeyer spillway gate. When the reservoir is full (elevation 800 feet), it has a maximum storage capacity of 377,900 acre-feet, is 18 miles long, and has about 165 miles of shoreline. The maximum elevation during flood stage is 825 feet, with a maximum temporary capacity of 538,000 acre-feet and a temporary surface area of 7,149 acres. Nacimiento Dam is under the jurisdiction of the DWR DSOD and the FERC. The FERC has jurisdiction over the project due to the existence of the hydroelectric plant. Nacimiento Dam was constructed and is owned MCWRA. It serves as a flood control, water conservation, and recreation facility.

Figure 13: Nacimiento Dam

San Antonio Dam

Figure 14: San Antonio Dam

San Antonio Dam and its reservoir, San Antonio Reservoir, are located in southern Monterey County, about 16 miles northwest of Paso Robles, in central California. San Antonio Dam was completed in 1967. This earth-filled dam has a height of 201 feet above the streambed and a crest length of 1,433 feet. The crest of the dam elevation is 802 feet above msl with a spillway crest elevation of 780 feet and a capacity of 35,400 cfs. When the reservoir is full (elevation 780 feet), it has a maximum storage capacity of 335,000 acre-feet, is 16 miles long, and has about 100 miles of shoreline. The maximum elevation during flood stage is 802 feet, with a maximum temporary capacity of about 477,000 acre-feet and a temporary surface area of about 7,500 acres. San Antonio Dam is under the jurisdiction of the DSOD. Like Nacimiento Dam, San Antonio Dam was constructed and is owned MCWRA. It serves as a flood control, water conservation, and recreation facility.

San Clemente and Los Padres Dams

The Carmel River has two significant dams which include the San Clemente Dam and the Los Padres Dam. These structures and associated reservoirs were originally constructed to supply water for the Monterey Peninsula and are currently operated by the CAW. No flood control storage is allocated in either reservoir, although some flood control benefits may be attributable to the dams early in the flood season when storage space is available as a result of summer drawdown for water supply. The dams have little effect on reducing peak discharges downstream late in the flood season once they have become full.

Figure 15: San Clemente Dam

The San Clemente Dam, constructed in 1921, is located 18 miles upstream of the ocean, and once provided drinking water throughout the Monterey Peninsula. It is a concrete arch dam with a 300-foot crest, 106 feet above the bedrock and 65 feet above the streambed. When the dam was constructed, it had a reservoir storage capacity of approximately 1,425 acre-feet. Today the reservoir has been filled by more than 2.5 million cubic yards of sediment, leaving a reservoir storage capacity of approximately 70 acre-feet.

The California Department of Water Resources issued a safety order for the dam structure early in 1991, determining that San Clemente Dam could potentially fail in the event of either a major earthquake of flood.

In 2010, an agreement was reached between CAW, the California State Coastal Conservancy, and the NOAA's National Marine Fisheries Service (NOAA Fisheries) to develop a feasible approach to cooperatively remove the dam and reroute the Carmel River. The benefits identified from removing the dam included, public safety, improved habitat for steelhead and California red-legged frog, and improved sediment transport to the lower Carmel River and Carmel River Beach. Due to limited and difficult access to the dam site and significant flooding issues along the lower Carmel River, the project design involves an innovative engineering approach to re-route a half mile portion of the Carmel River into San Clemente Creek. The Carmel River Reroute and San Clemente Dam Removal Project is the largest dam removal project ever to occur in California and one of the largest to occur on the West Coast. Construction and rehabilitation activities began in late 2013 and are expected to be completed by 2016. More information can be found at http://www.sanclementedamremoval.org/

The Los Padres Dam, built in 1949, is located 25 miles upstream from the ocean. The dam is a rock and earth-filled dam which is as high as a thirteen-story building; its base is as thick as a football field and has an overall crest measurement of 680 feet. Los Padres Dam, located in the upper reaches of the basin, is operated in a manner to maintain as much water as possible in San Clemente Dam. After the flood season has passed, flashboards are installed at San Clemente Dam to raise the spillway crest elevation by 12 feet. The flashboards are removed on approximately October 1 of each year, prior to the flood season.

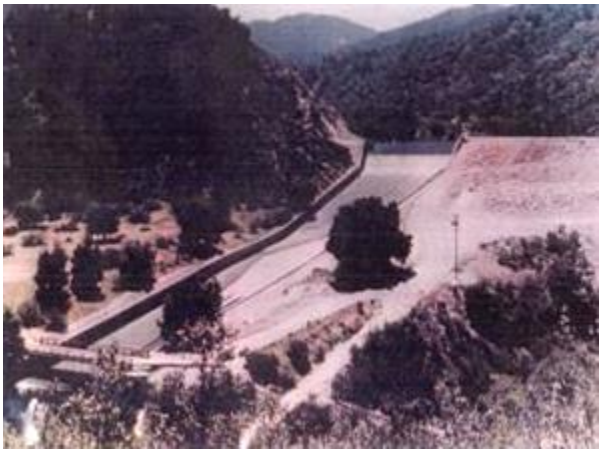


Figure 16: Los Padres Dam

10.2 Levees/Floodwalls

Carmel River Levees

Levees have been constructed by private interests on the Carmel River from State Highway 1 upstream approximately 4,000 feet on the north bank, and from 3,000 feet upstream of the mouth to 10,000 feet upstream of the mouth on the south bank. These levees are not adequate to hold the 100-year flood. Current project are underway on the Carmel River to address the concerns of flooding associated with these undersized levees. See section 10.6 Flood Control Projects.

Pajaro River Levees

Levees were completed along the Pajaro River by the USACE in 1949. Levees along the north bank begin just upstream of the mouth at the Pacific Ocean and continue to approximately River Mile 11.8 (Murphy Road). Levees along the south bank begin just upstream of the mouth and continue

to River Mile 10.6. The levees increased the capacity of the Pajaro River to 22,000 cfs downstream of Salsipuedes Creek, equivalent to a 25-year flood.

In 1963, the USACE performed additional studies and recommended that the levees along the Pajaro River be modified to provide additional protection. Construction was authorized in the Flood Control Act of 1966. A revised National Economic Development (NED) project is being developed at the request of the local sponsors (Monterey and Santa Cruz Counties). In 2013, local sponsors excavated over 300,000 cubic yards of material from the levees' interior bench embankments, increasing the system's capacity by approximately 10%. This project is known as the Pajaro Bench Excavation Project and is discussed in section 10.6 Flood Control Projects. A Final NED Environmental Impact Statement (EIS) addressing the more extensive levee improvements is expected in 2015-2016.

10.3 Drainage Facilities and Diversions

The MCWRA operates and maintains drainage facilities in fourteen drainage maintenance zones and districts located throughout Monterey County. The drainage improvements consist of approximately fifty-seven miles of improved drainage ways, eight pump stations; nine miles of river levees; two large earthen dams; and numerous culverts, tide gates, and concrete structures. The maintenance program is administered by the MCWRA Chief Engineer of Operations and Maintenance, and consists of a full-time 10 member crew dedicated to the operation and maintenance of these facilities. Inspection of the MCWRA facilities is performed on a regular schedule and on a daily basis during storms. The MCWRA has heavy equipment to perform debris and sediment removal, erosion repair work, and levee maintenance. Routine maintenance consists of ongoing removal of debris in drainage channels and pump stations; access roadway maintenance; guardrail and fence maintenance; spraying for vegetation control; baiting for rodent control; sediment removal in drainage ways; timely repair of eroded banks, mechanical equipment, and damaged facilities; and ongoing preventive maintenance. The following is a summary of some of the most significant drainage facilities:

- Lower Salinas River (Zone 3, formed 12/29/1952, appx length 8.9 mi): The zone contains 12,467 acres. The purpose of the zone is to protect life and property and to reduce suffering that could be caused by the flooding of the lower reach of the Salinas River. This zone maintains the Salinas River south of Spreckels to the mouth. The objective of the zone is to insure a clear and unobstructed channel for flood flows. The activities of the zone include spraying of the willows and other vegetation in the channel. This zone does not have an advisory committee; however, it is under the requirements set forth by NOAA Fisheries for the South-Central California Coast steelhead (S-CCC steelhead; *Oncorhynchus mykiss irideus*) and western snowy plover (*Charadrius alexandrinus nivosus*). The slide gate at the river mouth is utilized to control the elevation of the Salinas Lagoon at 3.5 feet per NOAA and NMFS requirements. This water is routed down the Old Salinas River Channel into the Potrero tide gate system (13 total; ten on bridge structure and 3 upstream) which outlets to the Pacific Ocean.

- Lake Merritt (Zone 5, formed 9/28/1959, appx. length 4.0 mi): The activities of the zone consist of maintenance of four pumps and the ditch system in Lake Merritt. This includes money to spray weeds, dredge ditches and to repair pump equipment as required. This zone has a group of property owners that meet as needed to make decisions that affect the zone. The ditch system is known as the Merritt Channel which receives water from the pump stations operating to empty Merritt Lake. The water routed into the Merritt Channel flows downstream to the Tembladero Slough.

- Soledad Storm Drain (Zone 8, formed 12/12/1967, appx. length 1.5 mi): The zone contains 6,374 acres. The purpose of the zone is to maintain the Soledad Storm Drain in accordance with an agreement by the MCWRA with the City of Soledad and the Department of Housing and Urban Development. The objective of the zone is to protect life and property and to reduce the suffering that could be caused by Bryant Canyon flood waters and runoff from the City of Soledad. The activities include vegetation control; cleanup of debris; rodent control; and maintenance of roads, fences, canal, and other appurtenances.

- Reclamation Ditch (Zone 9, formed 12/12/1967, appx. length 30.0 mi): The zone contains 55,859 acres. The purpose of the zone is to provide maintenance of the Reclamation Ditch and related facilities. The Reclamation Ditch is the storm drain for a major portion of the City of Salinas. It is the outlet to the ocean for three Gabilan Mountain streams, receives irrigation return water from adjacent farm lands, and drains a total of approximately 168 square miles. The objective of the zone is to protect life and property and to reduce the suffering that could be caused by the flow of the Reclamation Ditch and its tributaries by maintaining the Reclamation Ditch so that it will operate more efficiently. The activities include removal of silt from channels by mechanical means, vegetation control with sprays, removal of debris from ditch and drainage structures, the maintenance and repair of the tide gates at Potrero Road and at the Salinas River mouth, and replace inadequate drainage structures as soon as funds become available. This zone also includes a cooperative program between the MCWRA and the U.S. Geological Survey for maintaining and operating two stream gaging stations within the watershed. This zone accumulated funds and constructed new tide gates under Potrero Road as the existing gates needed extensive repair and were undersized for the ever-increasing flow of flood waters created by the urbanization of the watershed. The Reclamation Ditch is known to lack the hydraulic capacity necessary to provide even minimum levels of flood protection. MCWRA has proposed the Monterey County Board of Supervisor adopt an impact fee ordinance to provide a funding mechanism to maintain the existing level of flood protection. The impact fee would be charged to new development in the watershed which proposes to route additional storm water runoff to the undersized ditch. Consideration of the impact fee ordinance is pending.

- Carmel River Lagoon (Zone 11, formed 11/4/1969): The zone contains 97,280 acres. The purpose of the zone is to prevent flooding of property at the Carmel River mouth. The objective of the zone is to protect life and property and to reduce suffering that could be caused by flooding at the mouth of Carmel River. The activities of the zone include opening

the mouth of the Carmel River just before the first significant runoff of the winter season reaches the area by removing a portion of the sandbar that forms during the summer across the mouth of the river. This work is done by bulldozers making a channel through the sandbar. These activities are now performed by the Monterey County RMA-Public Works Department through an MOU with MCWRA.

- San Lorenzo Creek (Zone 12, formed 12/16/1969, appx. length 2.0 mi): This zone contains 5,018 acres. The purpose of the zone is to maintain the section of San Lorenzo Creek from the railroad to the Salinas River near King City. The objective of the zone is to reduce the probability of flooding near the creek. The activities of the zone include spraying weeds, maintaining the banks and channel, and removal of silt. As a result of the 1995 floods, a floodwall was constructed of sheet pilling approximately 6 feet in height and 250 feet in length. It extends from the 1st Street Bridge downstream and protects the trailer park and lower properties adjacent to the golf course.

- Moro Cojo Slough Watershed (Zone 17, formed 6/05/1984): The MCWRA operates a bank of three tide gates located under Moss Landing Road, in Moss Landing Harbor. The purpose of this facility is to limit tidal influences, and maintain freshwater and brackish habitats within the Moro Cojo Slough, in accordance with the 1996 Moro Cojo Management Plan. The facility has recently undergone repairs to leaking tide gates. The facility was installed in 1988 and is at the end of its anticipated 30-year design life. While currently operational, future repairs have been identified to extend the facility's useful life and restore its functionality to original specifications in accordance with the Moro Cojo Management Plan.

- Gonzales Slough Maintenance District (formed 11/03/1981, appx. length 5.0 mi): The purpose of the district is to provide for the maintenance of the drainage channel which runs along Alta Street in the City of Gonzales to the Foletta Road frontage road. The channel then enters a retention pond on the west side of highway 101 before it outlets to the Salinas River.

- Blanco Drain Maintenance District (formed 12/21/1942, appx. length 5.0 mi): The district contains 6,400 acres. The purpose of the district is to provide for the maintenance of the Blanco Drainage Ditch and pump station with 2 pumps which drain approximately 6,000 acres of farm land west of Salinas. The objective of the district is to facilitate drainage of storm water and irrigation return water. The activities of the district include mechanical cleaning of the ditch, and maintenance of the lift pump station. During the summer the pump station is operational to drain the water table so it is not negatively impacting the root zones of irrigated crops. During the flood season the pump station is shut down and a slide gate is also operated to release winter flows directly to the Salinas River.

10.4 Storm Drain Improvements and Basins

Storm drain improvements and basins are commonly constructed by public and private entities to store surface runoff and release its flow through a controlled outlet downstream. These improvements are a relatively intensive and effective measure to provide flood control when large amounts of rainfall can produce flooding. The RMA-Public Works Department and the MCWRA

performs annual maintenance of various storm drain improvements and basins found within their respective CSAs, zones, and districts. In addition, large privately-owned projects such as residential subdivisions and commercial developments use such improvements to mitigate the impacts of additional stormwater runoff. The MCWRA administers a mitigation monitoring program which oversees annual reporting of maintenance programs for approved subdivisions and similar projects. These projects are responsible for maintaining flood control systems such as storm drainage and basins which are operated to mitigate the impacts of additional storm water runoff volumes and rates. The requirement is for respective projects to submit an annual drainage report to the MCWRA by August 15 of each year.

10.5 Stream, Channel, and Basin Maintenance

Routine maintenance in streams, channels, and basins can alleviate flooding which is common when these areas are clogged. The blockage can be from vegetation overgrowth, debris, sedimentation, or components that fail with age. The RMA-Public Works Department and the MCWRA perform annual maintenance of portions of streams, channels, and basins found within their respective CSAs, Zones, and Districts. This flood control maintenance includes debris removal under on bridges, culverts, channels, and storm drains to prevent flooding of adjacent roadways and areas.

Salinas River Stream Maintenance Program

The MCWRA and project partners have developed a Stream Maintenance Program (SMP), consisting of a coordinated approach to vegetation and sediment management, which is implemented on a voluntary basis by individual property owners, growers, and municipalities. The program is a short-term SMP that provides maintenance evaluation procedures that are used by the participants to effectively implement routine stream maintenance activities in a timely, cost-effective and environmentally-sensitive manner. The SMP is a science-based collaborative process that provides policy and field procedures to allow participants to conduct stream maintenance activities (i.e., non-native invasive and native vegetation treatment and sediment management) to maximize flood flow capacity and minimize bank erosion while minimizing environmental effects, helping to reduce flooding during and after major storm events of less than a 10-year occurrence interval, while enhancing habitat value.

10.6 Flood Control Projects

Bryant Canyon Channel Improvement Project (Ongoing)

In 2001, after close to ten years of negotiation with several different property owners, the MCWRA purchased 5.77 acres of land located on Bryant Canyon Road in order to extend the inlet of the channel. The purchase price of the subject property was $81,008 and was paid out of Zone 8. The land purchase was approved by the Monterey County BOS on December 4, 2001. The Bryant Canyon Channel Improvement Project commenced construction in 2002, which included 40,000 cubic yards of drainage ditch excavation, installation of three drop structures, and the installation of a temporary 66" culvert under Bryant Canyon Road. This project was coordinated by the MCWRA and included the Gabilan Conservation Camp Crew installing the structures and an excavation services agreement that included rough grading to MCWRA specifications and removal of material at no cost to the MCWRA.

Finished grading was not performed. The MCWRA did not have adequate funds in Zone 8 to complete the remaining 10 drop structures, to install the necessary rock slope protection, or to install the permanent box culvert under Bryant Canyon Road. These improvements were estimated to cost in excess of $1 million. Zone 8 has annual revenue of approximately $66,000 and includes the responsibility of maintaining the Soledad Storm Drain in accordance with an Agreement between the MCWRA, the City of Soledad, and HUD, and operating and maintaining the newly constructed extension of the Storm Drain.

In 2014, the MCWRA engaged in discussions with a developer who is seeking to complete the unfinished Bryant Canyon Channel improvements as part of their project which is located in the vicinity. The newly proposed Miravale II Unit III is located within the Soledad city limits, but will be adjacent to the channel and discharge stormwater runoff into the channel. In addition, Miravale II Unit III is considered to be in an area subject to flooding due to the unfinished nature of the Bryant Canyon Channel Improvement Project. The developer has agreed to construct the unfinished improvements to the Bryant Canyon Channel Improvement Project, as stated above. The developer and the MCWRA have considered entering into a subdivision improvement agreement to complete the construction. This project is undergoing USACE 401 Permit and EIR review. The project status is ongoing.

El Toro Creek Sediment Removal Project (Completed)

After the 1995 floods, the need to remove sediment in El Toro Creek was recognized and the Lower El Toro Creek Sediment Removal Project was implemented. The project was made possible through participation in the USDA-Natural Resources Conservation Service Emergency Watershed Protection Program (EWP). The EWP was invoked as a result of the March 1995 flooding of the Creekside Condominium property. Removal of 7,954 cubic yards of sediment from 3,062 lineal feet of El Toro Creek adjacent to the Creekside Condominium property and the PG&E Substation was completed on December 29, 1995. The entire project was undertaken on U.S. Army property at Fort Ord. A corridor of approximately 30 feet in width was also cleared of vegetation for the entire length of the project. Approximately 100 rooted willow trees were removed. Final excavated dimensions of the channel were 20 feet bottom width with 2:1 side slopes.

Scrapers removed the sediment to a nearby transfer point where bottom dump trailers were loaded and the sediment hauled to pre-arranged disposal sites. The construction cost was approximately $69,700. U.S. Bureau of Land Management staff sprigged approximately 300 willow cuttings in February 1996 at critical locations to help prevent further erosion of already eroded creek banks. Project participants included USDA – Natural Resources Conservation Service (major funding provider); California State Office of Emergency Services (partial funding provider); Monterey County Service Area No. 15 (partial funding provider); MCWRA (designer/construction manager/project admin); Gabilan Conservation Camp; State Department of Corrections, Soledad, CA (tree/vegetation trimming and removal); The Don Chapin Company (Construction Contractor); U.S. Bureau of Reclamation (willow planting labor); Monterey County Public Works Department; and Merrill Farms, Salinas, CA (sediment disposal site providers).

Project permits obtained:

- California Dept. of Fish and Game Stream Alteration Agreement No. 1172-95
- U.S. Army Corps of Engineers Clean Water Act Section 404 Permit exemption
- California Regional Water Quality Control Board, Water Quality Certification

Recently, there has been a concerted effort to prevent further erosion (driven by the U.S. Bureau of Land Management, and facilitated in part by the California State University, Monterey Bay Watershed Institute) to replant willows along miles of El Toro Creek banks. The most recent effort was made in 2012, when thousands of willows were planted and miles of irrigation hose were installed to facilitate watering.

Las Lomas Drive Storm Drain Improvement Project (Under Construction)[12]

The RMA-Public Works Department is installing a new storm drain system to carry storm water runoff to eliminate the repetitive concern of flooding along Las Lomas Drive in the community of Las Lomas. The community has expressed concerns about localized flooding that periodically occurs in this area, a portion of which is a FEMA 100-year floodplain.

The proposed underground drainage system begins approximately 80 feet north of the intersection of Las Lomas Drive and Thomas Road and proceeds southerly to a new outfall into the existing ditch north of Hall Road and east of Las Lomas Drive. The proposed drainage system replaces existing roadside ditches along Las Lomas Drive. No modifications are proposed for the existing open channel ditch north of Hall Road.

The new underground storm water collection system along Las Lomas Drive will include a single 48-inch diameter concrete pipe in the steeper upstream portion of the project. The corroded arched corrugated metal pipe under Hall Road will be replaced with two 3 feet high by 5 feet wide box culverts. Along Las Lomas Drive, a system of manholes and catch basins will be installed to collect surface runoff. RMA-Public Works Department staff is updating the environmental document and designing the project. Construction is expected to commence in the summer of 2015.

Lower Carmel River Flood Control Projects (Ongoing)[13]

There are three projects currently occurring in the lower Carmel River area that will help serve to mitigate 69 RL Properties in this area [i.e., 3 RL Properties near the Carmel Lagoon and 66 RL Properties in CSA-50 (excluding 2 RL Properties on the river side of the Rio Road tie-back levee)]. The projects are described in detail below and the regional project area is shown in figure 17.

1. CSA-50: Stormwater and Floodplain Management Plan

Due to historical flooding within CSA-50, which has caused extensive damage to residences and businesses in the area, the Monterey County BOS approved a Professional Services Agreement, on June 26, 2001, with Philip Williams and Associates, Ltd. (PWA). The objective was to perform computer modeling of flooding impacts associated with stormwater runoff and flow from the Carmel River for CSA-50 with the goal of reducing the magnitude and frequency of flooding within CSA-50 and optimizing the use of CSA-50 funds on the most cost-effective projects. . As a result of

[12] Source of project description: Creegan + D'Angelo. 2014. Las Lomas Drive Hydrology and Hydraulic Study.
[13] Source of project description: Monterey County Resource Management Agency 9/15/2015.

the agreement, PWA, Ltd prepared *The Lower Carmel River Flood Control Project Final Report*, dated August 9, 2002 (PWA 2002).

In PWA 2002, a set of structural and operational improvements were identified to reduce flood hazards within CSA-50. Due to a number of factors over time that directly affected flood control planning since the PWA 2002 for CSA-50 was completed,many physical and regulatory changes occurred along the lower reaches of the river, so an updated plan was determined to be needed. Therefore, on July 30, 2013, the Monterey County BOS approved an agreement with surveyors, architects, engineers, and design professionals with Balance Hydrologics, Inc., to provide an Updated Flood Control Project Report for CSA- 50. The draft report, which was completed August 2014, analyzed flood risks and hazards within CSA-50 with emphasis to changes that have occurred since earlier studies were completed. Stormwater management issues were discussed, particularly those related to water quality enhancement as it relates to the sensitive habitats of the lower river corridor. Supplemental fieldwork, technical analyses, and hydrologic and hydraulic modeling were also summarized to help identify project elements that could be implemented based upon two flood protection options and two land use scenarios. The two flood protection options considered were FEMA and non-FEMA levels of protection. The two land use scenarios considered were existing and potential future land use conditions, which included consideration of the Carmel River Floodplain Restoration and Environmental Enhancement Project (CRFREE), Eastern transition grading along Palo Corona Park and the proposed Rancho Cañada residential development.

Figure 17: Lower Carmel River and Lagoon area, May 2010

Upon review of the report, the CSA-50 Citizens Advisory Committee recommended pursuing project elements that would provide the FEMA level of flood protection under the future conditions land use scenario. In this scenario, CSA-50 could be removed from the 100-year floodplain following construction of the Carmel River Floodplain Restoration and Environmental Enhancement Project, eastern transition grading, and selected program elements.

CSA-50 Flood Protection Project Elements

Val Verde Levee Improvements

- The tie-back levee at Val Verde Road and Rio Road would be extended and raised to the base flood elevation plus 3.5 feet through a combination of sheet pile flood wall and levee improvements.

Stormwater Quality and Interior Drainage Improvements: Sub-Areas 1, 2 and 3

Rio Road Stormwater Treatment: Drainage along the north side of Rio Road west of Highway 1 should be conveyed to the Mission Canyon system, where it eventually outfall to the river just upstream of Carmel Lagoon. However, there is no formally maintained conveyance infrastructure, and runoff can sheetflow across the roadway into the Mission fields neighborhood. The local drainage area to Rio Road comprises a total land area of 27 acres, all of which is currently developed in single-family homes on steep terrain with no water-quality control measuresThe proposed project would construct a vegetated bio swale to effectively collect, treat, and convey runoff from the contributing drainage area to the downstream Mission Canyon system.

Mission Fields Pond Retrofit: The Mission Fields Pond is an as-needed short-term flood control detention facility located directly adjacent to the Carmel River in the Mission Fields neighborhood west of Highway 1. In its current configuration the "pond" is essentially a dry feature, except for short duration periods of heavy rainfall when the river is at high stage. The proposed project would reconfigure the terminal ends of the two trunk storm drain lines and retrofit the basin to convert the structure to a bioretention facility. Both lines would be modified to discharge into the basin in a manner to preclude short-cutting of flow between the inlet and outlet.

Riverside Pond Retrofit: The Riverside Ponds is located immediately adjacent to the river at the southwest corner of the Mission Fields neighborhood, roughly 600 feet west of the Mission Fields Pond. The "pond" currently functions analogously to the Mission Fields Pond, only receiving and detaining stormwater runoff in periods of very heavy rainfall and/or when the river is at very high stage. The proposed project would retrofit the existing basin in exactly the same manner as that for the Mission Fields Pond, fully converting it into a bioretention facility.

DA-29A Trunk Strom Drain Line: The 72-inch diameter DA-29A trunk drain pipe is currently the primary outlet to the river for runoff from Hatton Canyon (DA-29). The outfall for this system lacks a flapgate and leaves this drain line susceptible to backflow from the river. However, in this case there are few openings along the pipe at elevations low enough to overflow from river backflow. A notable exception is the large junction box structure located just south of Rio Road at the northwest corner of the Arroyo Carmel residential area. This 5-foot by 6-foot box is currently equipped with a relatively light-weight lid that is easily removed. A cost-effective way to eliminate a large share of the risk from river backflow is to retrofit this junction box with a bolt down cover equipped with appropriate seals.

DA-28 Storm Drain Outfall: The intensively developed commercial and residential areas along Carmel Rancho Boulevard are conveyed to the Carmel River as part of the overall Drainage Area 28 system, discharging via a single 42-inch diameter outfall located approximately 2,600 feet upstream

of Highway 1. Overall, DA-28 encompasses 184 acres, of which 53 are commercial and high density residential, with the remainder split between single-family homes and open space. There is currently very limited stormwater quality infrastructure in place, all associated with the few development projects that have been constructed most recently. The proposed project would retrofit the existing DA-28 trunk storm drain line just upstream of the existing river outfall with a manufactured treatment control device..

2. Carmel Lagoon Ecosystem Protective Barrier, Scenic Road Protection Structure, and Interim Sandbar Management Plan Project

The Carmel Lagoon (lagoon), located at the mouth of the Carmel River, is a very productive estuary that serves as habitat for federally listed South-Central California Coast steelhead (S-CCC steelhead; *Oncorhynchus mykiss irideus*), California red-legged frog (CRLF, *Rana draytonii*), western snowy plover (*Charadrius alexandrinus nivosus*), and Smith's blue butterfly (SBB; *Euphilotes enoptes smithi*). Sandbar management activities at the lagoon have historically been conducted at the Carmel River State Beach to mitigate flooding impacts to low-lying properties when river flow increases in the fall and early winter. Lagoon water levels can rise to flood stage with the result that public and private properties are threatened with flooding before the sandbar would open naturally. Breaching dynamics directly affect lagoon stage (water surface elevation), which in turn determines aquatic habitat volume and area, as well as water quality. As a result, mechanical breaching of the lagoon (i.e., for flood protection) has the potential to adversely affect federally listed fish and wildlife in conflict with federal law. Natural breaching is therefore preferred by environmental groups and key governmental agencies with an interest in the lagoon. Breaching at the north end of the lagoon facilitates a longer and more natural outflow channel, improving conditions for fish and wildlife within the lagoon, but has threatened to undermine Scenic Road and adjacent properties in the past.

The proposed project is a comprehensive plan meant to promote improvement in ecological function of the lagoon, including natural floodplain function and improvement of habitat for federally listed species associated with the lagoon, by allowing the lagoon to breach naturally, without increasing flood and erosion risk to private structures and public facilities. The project area includes the lagoon and adjacent wetland, riparian and coastal strand habitats. The proposed project involves implementing three project components: 1) Ecosystem Protective Barrier (EPB), 2) Scenic Road Protection Structure (SRPS), and 3) Interim Sandbar Management Plan (ISMP).

The project is intended to provide a long-term solution to flooding and habitat impact issues that avoids the unauthorized take of listed species in compliance with federal law, while maintaining the existing level of protection to properties and infrastructure. The project is currently in the environmental review stage, and distinct components are detailed below.

Ecosystem Protective Barrier

The proposed EPB alignment includes a setback of up to 40 feet from the State Parks property line with a top of wall elevation of 17.5 feet based on the North American Vertical Datum of 1988. This option was recommended as a component of the preferred alternative because it:

- Maintains the current level of protection of facilities and homes accounting for sea level

rise over the next 50 years;

- Minimizes ecological impacts by eliminating drainage infrastructure and fill;
- Minimizes visual impacts with a lower height and greater area of vegetative cover;
- Reduces noise because of smaller pumps with less frequent pumping; and
- Increases area that serves as a bio-swale to collect urban runoff.

Scenic Road Protection Structure

The feasibility report for the project evaluated four different alignments and designs ranging from riprap at the toe of slope to a pile wall located at the top of slope (edge of right-of-way). SRPS Alternative 1 – Revetment (Rip Rap) Located at Toe of Slope was determined to be the preferred alternative. The proposed SRPS project component consists of rock slope protection, also known as rock rip-rap or revetment, placed at the toe of the road embankment. The placement of armor rock would extend up as needed to protect Scenic Road from river scour and would extend down below the anticipated outlet channel scour elevation. The outer rock layer would be sized to withstand extreme ocean wave and river current forces (e.g., ½- to 1-ton sized rock) with a thinner layer of smaller rock and/or geotextile fabric underneath to prevent the soil from being eroded through the revetment. The feasibility report determined that rip rap provides the most natural material and the structure would be covered with sand when the beach is not breached. The alignment allows continued use of the beach area located north of the barrier when, and if, the river breaches to the north.

Interim Sandbar Management Plan

The County is seeking permits for a long-term solution that would avoid performing mechanical breaching for flood control purposes. The process for complete environmental review, permitting, design, and construction is estimated to take up to eight years, depending on the resources availability; however, the County is making every effort to minimize this timeframe. In the interim, the County has developed the 5-Year ISMP in coordination with the regulatory agencies for managing the lagoon, including winter openings and summer closure in the best possible manner that reduces potential impacts to both wildlife and property. The activities, conditions, and implementation of the ISMP will be carried out in accordance with the approved MOU between the County, USACE, and NMFS.

The ISMP includes the following components:

- *Sand bags* / As a first course of action ahead of the rainy season, generally defined as October 15 – April 15, and before mechanically managing the sandbar, the County will stockpile sand and place sand bags along the property boundary of State Parks and homes along the north end of the lagoon (Camino Real, River Park Place, Monte Verde Street, and 16th Avenue).
- *Public Outreach* /The County will initiate public outreach to warn homeowners so they take appropriate precautions to protect their property during the rainy season.
- *Sandbar management* / The County, after receiving appropriate approvals from permitting agencies, will manage the sandbar for ecological function and flood protection.
- *Re-establishment & Summer Management* / The County would assure any outlet channel

work performed during the winter is closed off and the sandbar restored at the conclusion of the rainy season.

3. Carmel River Floodplain Restoration and Environmental Enhancement Project

Project Description

The Proposed Project consists of two interdependent Project components: the Floodplain Restoration and the Causeway. The Floodplain Restoration consists of 1) removing approximately 1,470 linear feet of non-structural earthen levees on the south side of the Carmel River channel; 2) grading to elevate approximately 23 acres of existing farmland above the 100-year floodplain elevation to create an agricultural preserve; 3) grading on approximately 100 acres to restore the site's ecological function as a floodplain by creating the hydrogeomorphic characteristics necessary to support floodplain restoration activities; and. 4) implementation of the Restoration Management Plan, which includes restoration of a mosaic of native habitats across the site in two phases, restoration maintenance, and monitoring to ensure the success of the revegetation specific to compensatory mitigation requirements. The Causeway consists of replacing a portion of the SR 1 roadway embankment with a 360-foot long causeway section in order to accommodate flood flows that enter into the south overbank area as a function of the removal of portions of the levees as described above and to restore hydrologic connectivity between the Project site and the south arm of Carmel Lagoon. The Project would result in the reconnection and restoration of approximately 100 acres of historic floodplain. A detailed description of each of the proposed components is provided in more detail below in the Project Specifics.

Project Goals and Objectives

The purpose of the Project is to restore the lowest reach of the Carmel River to increase native habitats and provide flood control benefits to areas prone to flood hazards. The Project would address the long standing problems of floodplain habitat loss and flood management while providing important habitat for several wildlife species and retaining agricultural resources. The key components of this The Project's objectives are as follows:

- Recover the natural functions and values that were present historically along the floodplain prior to modern influences through the hydraulic reconnection of the floodplain to the main channel of the Carmel River.
- Establish the type of vegetation typical of river corridor environments and provide a denser and more diverse riparian habitat.
- Restore approximately 100 acres of riparian and upland habitats within the historic floodplain thereby providing important habitat for sensitive species including the federally listed, California red-legged frog (*Rana draytonii*).
- Utilize the improved connectivity between the main channel and south overbank areas to reduce flooding hazards along the developed areas located north of the river.
- Increase flow conveyance and habitat connectivity between the Project site and Carmel River Lagoon Enhancement Project through the reconnection of the Project site with the adjacent floodplain, benefiting habitat for the federally listed, south/central California Coast Steelhead (*Oncorhynchus mykiss*).
- Provide storage and recharge of groundwater on the restored floodplain.

- Improve quality of water entering the Carmel Lagoon by providing additional storage and filtration for sediment and nutrients through a functioning floodplain and associated riparian habitat.
- Maintain an active organic agricultural operation on a portion of the Project site in order to preserve historically important agricultural operations.

Project Specifics

The Floodplain Restoration Component of the CRFREE Project would: 1) remove approximately 1,470 feet of the south bank levee in order to improve floodplain hydrology, 2) restore floodplain topography to approximately 100 acres of existing farmland to support native habitat restoration, and 3) preserve the agricultural heritage of the site by creating an approximately 23-acre agricultural preserve raised outside of the FEMA 100-year flood boundary using fill material from the other Project components.

Levee Removal: Approximately 1,470 feet of the south bank levee would be removed in order to improve floodplain hydrology. Currently, the system of south bank non-engineered levees serves to contain existing river flows and floodwaters in the main river channel. The Proposed Project would reduce the height of portions of the existing levees in order to allow flows to spread into the south overbank area, which is part of the historical floodplain. Several portions of the existing levee, approximately 3,180 feet in length, would remain to preserve important areas of existing vegetation that would support colonization and expansion of riparian plant communities to the floodplain.

Floodplain Grading: The floodplain would be graded to create the topographic characteristics necessary to support floodwater conveyance under SR 1 and restore the site's longitudinal connectivity with the Carmel Lagoon. Floodplain improvements would include topographic modifications consistent with riparian habitat conditions, channelization to resemble flow paths in older floodplains, and channel segments designed to support native upland habitat.

Agricultural Preserve: An approximately 23-acre agricultural preserve would be constructed on the southern portion of the site, where organic agricultural uses would be consolidated in order to maintain the agricultural heritage of the area. Construction of the agricultural preserve would entail creating an elevated terrace and farm access road above the existing floodplain to avoid inundation from floods as large as a 100-year flood event. The elevated agricultural preserve would be created using excess fill material (275,000 cubic yards) from the levee removal, floodplain grading, and construction of the Causeway Component.

Maintenance/Access Roads and Trails: A network of access roads is included as part of the design. A clearance of a minimum of 10 feet has been provided underneath the causeway, near the north abutment, for a future trail connection between the east and west portions of the floodplain. Additionally, the maintenance access roads have the ability to function as dirt trails, if desired.

Restoration Management Plan: The Project site will be actively revegetated following grading according to the Restoration Management Plan (RMP) prepared for the Project to accelerate native vegetation establishment (HTH, 2015). Revegetation implementation will establish a mosaic of

habitats across the site, including willow and cottonwood riparian forest, mixed riparian forest, coastal scrub, and grassland that will feature various canopy heights and structures. This mosaic will provide a diverse array of foraging, breeding, and nesting habitats for birds and other wildlife. Restoration areas will be restored with a tiered planting approach. All compensatory mitigation will be installed during Tier I, and the following phase(s) will target restoration of all remaining areas on the Project site through adaptive management. The RMP also includes maintenance and monitoring of the revegetation areas.

Causeway: The Causeway Component consists of replacing of a portion of the SR 1 roadway embankment (Route 1, Post Mile 72.0 to 72.3) with a 360-foot long causeway section. The northern end of the proposed causeway would be located approximately 1,150 feet southwest of the Oliver Road and SR 1 intersection, near the city of Carmel in Monterey County. The southern end of the causeway would be located approximately 2,000 feet northeast of the Ribera Road and SR 1 intersection. The purpose of the proposed causeway is to accommodate flows that come into the south overbank area and to increase hydrologic connectivity between the Carmel Lagoon and the Proposed Project site. The proposed causeway would increase flood conveyance for all floods, including a 100-year flood.

Nacimiento-San Antonio Interlake Tunnel Project (Under-Review)

The Interlake Tunnel Project (Interlake Tunnel) has been under consideration since 1978 as a way to manage flood control releases from Nacimiento Reservoir. The Interlake Tunnel was later included in the July 1991 Water Facilities Capital Plan prepared by Boyle Engineering Corporation for the MCWRA. Operationally, the Interlake Tunnel would divert water from Nacimiento Reservoir to San Antonio Reservoir that would have otherwise been spilled at Nacimiento Dam. The Nacimiento River basin produces nearly three times the average annual flow of the San Antonio River basin; therefore, capturing high Nacimiento River flows and diverting those flows to San Antonio Reservoir increases the overall storage capacity of the system.

Figure 18: Proposed approximate tunnel alignment.

Subsequent to 1991, MCWRA efforts were focused on completion of the Salinas Valley Water Project which included construction of the Salinas River Diversion Facility and modifications to the Nacimiento Dam Spillway. The current drought has created a renewed interest in the Interlake Tunnel concept.

The Interlake Tunnel requires a detailed engineering analysis, but is generally planned to consist of an 11,000-foot gravity flow tunnel with an intake structure in Nacimiento Reservoir and an exit structure in San Antonio Reservoir. The total cost of the Interlake Tunnel is estimated at $48 million. Depending upon the degree of environmental documentation required, the Interlake Tunnel could be completed in two to three years.

There is also a possible opportunity to increase storage capacity in the San Antonio reservoir by modifying the spillway with a crest control device. This concept has the effect of "raising the dam" to increase storage. It is estimated that a 10-foot rise could increase the storage capacity of San Antonio reservoir by 60,000 acre-feet. This potential added storage increases the benefits of the tunnel by providing additional storage for flood control and conservation releases. Total cost for the spillway modification at San Antonio Reservoir is estimated at $15 million. It's planned that the San Antonio Spillway modification construction will be done simultaneously with the Interlake Tunnel.

In terms of flood control benefits, computer modeling over a 47-year period shows that the incorporation of the Interlake Tunnel and the San Antonio Spillway modification would reduce the amount of reservoir spills by 52%. The Interlake Tunnel has been divided into three phases: project feasibility, including preliminary engineering and water rights requirements analysis; pre-construction tasks, including environmental review, permit applications, geotechnical and final design, right-of-way acquisition and financing arrangements; and construction.

The MCWRA, with approval of the BOS of the MCWRA, proceeded to contract with a Program Manager to begin project feasibility and pre-construction tasks. However, the MCWRA will not proceed beyond the preliminary engineering and water rights requirements analysis until environmental review is completed and authorization to proceed is received from the BOS of the MCWRA. Request-For-Proposal (RFP) solicitation for the project was completed in June 2015. The MCWRA is currently reviewing all acceptable RFPs. The feasibility of this project is "under review".

Pajaro River Bench Excavation Project (Under-Construction)

The Pajaro River Bench Excavation Project is a multi-jurisdictional effort to improve the channel conveyance of the Pajaro River. The City of Watsonville, Santa Cruz County, and Monterey County are cooperating in the effort to excavate portions of the water side of the levee and benches to increase the system's capacity by 10% and to decrease the intensity and severity of floods. The total project cost is approximately $6.5 million,

Figure 19: Phase I photo of bench excavation on the Pajaro River.

with $3.5 million made available through local contribution and the remaining $3 million from the Prop. 84 Local Levee Assistance Program. The project is being implemented in two phases by the Santa Cruz County Department of Public Works. The estimated completion date is late summer 2015.

Ralph Lane Flood Control Project (Tabled)

After the 1995 floods, various Monterey County departments and Caltrans began a coordinated effort to provide flood control solutions for the area. The following recommendations were provided:

- Better erosion control practices on neighboring strawberry farms.
- MCWRA would clear the drainage channel within the existing right of way.
- Channel road drainage away from the houses along Ralph Lane.
- Increased maintenance of Highway 101 drainage facilities.

During the 1998 El Niño floods, the Ralph Lane area flooded again (FEMA Disaster 1203). After the floods, the MCWRA hosted several public meetings with Ralph Lane residents to determine potential actions to alleviate future flooding. The MCWRA staff presented a structural solution that required property owners to dedicate a portion of their land for a right-of-way easement necessary to construct and maintain the proposed project. Over approximately eighteen months, MCWRA staff met with property owners to discuss the need to acquire the right-of-way. During October of 1999, it was decided that no further action would be pursued due to the unwillingness of some property owners to dedicate their property for the needed right-of-way.

Summary of Events:

- The BOS directed MCWRA to obtain the necessary right-of-way to construct the Ralph Lane Flood Control Project by coordinating with the property owners and with (then) Supervisor Pennycook, and using eminent domain powers, if necessary.
- Supervisor Pennycook invited the 11 affected property owners to a meeting on October 27, 1999. Staff and the Supervisor met with five of the 11 property owners to request their support for the project by granting the needed right-of-way.
- The project was reviewed and various issues discussed, such as making minor changes to the proposed ditch alignment and inquiring on the use of right of way from Caltrans (Highway 101).
- Supervisor Pennycook provided an Option of Easement form to property owners in attendance requesting their commitment to the project. She stated that if they responded positively by signing and returning the document to MCWRA, she would contact and coordinate with the other six property owners not present.

To date, MCWRA has not received a response from any of the property owners. MCWRA sent out RFPs to two locally qualified appraisers for conducting an initial appraisal for negotiation purposes and to complete a full appraisal for court proceedings, if necessary. Only one proposal was received by MCWRA. Staff plans no further action unless the Committee or the current Supervisor provides direction.

Salinas River Lagoon Management and Enhance Activities (Ongoing)

The 1997 Salinas River Lagoon Management and Enhancement Plan was prepared to address issues and concerns relating to the lagoon. The Salinas River Lagoon project area includes the lower end of the Salinas River. The plan and activities were developed through consultation with the Salinas River Lagoon Task Force. The Task Force was composed of federal, state, and local agencies, along with local agricultural representatives. The management and enhancement plan includes recommendations for breaching activities of the Salinas River Mouth (now known as Salinas River Lagoon Sandbar Management), vegetation and wildlife, fish and aquatic resources, and water quality.

11. Public Information

Public information activities advise property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the natural and beneficial functions of local floodplains and include:

- Map information
- Outreach projects
- Real estate disclosure
- Library
- Technical assistance
- Environmental education

The Monterey County Floodplain Management Program emphasizes outreach and education to the over 5,000 residents and businesses located in and near the 100-year floodplain. This program is effective in reaching the general public as well as those located in repetitive loss areas. The program's public outreach messages are targeted to produce an action to help individuals and groups better understand flood hazards, how to protect themselves, and the flood mitigation assistance that is available to those in the 100-year floodplain.

11.1 Map Information

Flood zone map information is an important tool by which the community can help its residents and businesses better understand their exposure to flood risk. The information provided on a flood map helps the public become more aware of flooding hazards and the steps to take to avoid problems and/or reduce the hazards of flood waters. Real estate agents and potential home buyers can also use flood zone mapping to determine whether or not a property is in the 100-year floodplain and whether flood insurance may be required. As a result of FEMA's Map Modernization Efforts, the public has accessibility to reliable flood zone information which can be accessed electronically.

The Monterey County RMA website has the most recent DFIRM layer available for review in its GIS mapping portal located at http://www.co.monterey.ca.us/government/departments-i-z/information-technology/gis-mapping-data. The County's online GIS portal allows community residents and stakeholders to easily access flood hazard and other natural hazard information. This form of mapping is acceptable for information purposes.

More specific flood zone information should be obtained when considering development or improvements to property located in the 100-year floodplain. The MCWRA can provide specific flood zone details such as base flood elevation and floodway boundary information to property owners, builders, and developers for the purpose of design and engineering. This type of service is referred to as a "flood zone inquiry report" and for a fee of $83.00 or $55.00 the requester will receive a digitally produced map containing relevant DFIRM information. The MCWRA staff is also available to explain flood insurance and general information for the process of FEMA Letters of Map Change.

11.2 Outreach Projects

The MCWRA completes an annual public outreach project targeting all parcels located within or near a FEMA-designated 100-year floodplain. In November 2014, brochures were mailed to over 5,000 residents in coordination with Winter Storm Preparedness Week. As required by CRS Activity 330, the mailer includes information concerning the local flood hazard, flood safety, flood insurance, property protection measures, the flood warning system, floodplain development permit requirements, substantial improvement/substantial damage requirements, and guidance on financial assistance.

11.3 Real Estate Disclosure

Real estate disclosure helps provide information to people before they are committed to owning or occupying a piece of property that is subject to a flood hazard. The Monterey County floodplain ordinance (Chapter 16.16) enforced by the MCWRA includes a statement of purpose to ensure that potential buyers are notified that property is in the SFHA. As a result of this policy, property owners are required to record a "Floodplain Notice" for all land use and construction permits involving parcel ownership in the 100-year floodplain. The floodplain notice is a deed record which notifies the public that "this property is located within or partially within a Special Flood Hazard Area and may be subject to building and/or land use restrictions".

11.4 Library

The MCWRA maintains and updates a collection of floodplain management related publications in its library system. The MCWRA collection consists of the most current and previous copies of the FEMA Flood Insurance Studies and Flood Insurance Rate Maps for Monterey County. The collection contains FEMA publications related to substantial damage and substantial improvement, elevating your flood-prone home, determining base flood elevations in Zones A, etc. These types of publications can be electronically accessed by going directly to the FEMA website https://www.fema.gov/floodplain-management-publications. In addition to these items, the MCWRA maintains a collection of community-prepared drainage studies and plans which are useful to design professionals who are tasked with engineering adequate drainage and flood control improvements.

11.5 Technical Assistance

As identified in the annual public outreach mailer, the MCWRA is available to give advice to the public on matters such as identifying flood hazards, correcting local drainage problems, floodproofing, and federal flood mitigation assistance. The MCWRA also is available to make site visits upon request to address and discuss local flood hazards and drainage problems.

12. Repetitive Loss Areas

12.1 Description of the Repetitive Loss Problem

This problem assessment includes a review of historical damage to buildings, including all properties that have received flood insurance claims. Monterey County has 109 RL Properties resulting in 13 RL Areas. These RL Areas contain a total of 1,311 properties which are subject to the same flood risk as the 109 RL Properties. A majority of the RL Properties in Monterey County were built before joining the regular phase of the National Flood Insurance Program (1984); therefore, they are considered pre-FIRM structures. Many of these RL Properties were built below the base flood elevation because maps and floodplain regulations were not available or enforced at the time. Table 3 identifies the number and types of buildings subject to flooding from different sources and Table 4 provides a summary of the flooding history and the insured status for each RL Property. The Monterey County RL Property Statistics include:

- 99% of Monterey County RL Properties are pre-FIRM structures.
- 85% of the RL Properties are located along the Carmel River.
- 62% of the RL Properties are located within CSA-50.
- 72% of the RL Properties received their only two losses during January and March 1995.
- 70% of the RL Properties currently have flood insurance coverage.

Table 3: Monterey County RL Property Building Types

RLA#	Flooding Source	Total No. of RLPs	Building Types		
			Commercial	Multi-Family	Single Family
1	Big Sur River	1	1		
2	Calera Creek	1*			1
3	Carmel Highlands Coastal Flooding	1			1
	Carmel River				
4	Lagoon/CSA-50	3/68*			3/68
5	Upper Carmel	22*		1	21
6	Carneros Creek	2			2
7	Castroville Boulevard Wash	1			1
8	El Toro Creek	2		2	
9	Paloma/Piney Creek	2*			2
10	Pebble Beach Localized Flooding	2	1		1
11	Ralph Lane Channel	1			1
12	San Miguel Canyon Creek	1			1
13	Santa Rita Creek	2			2
		109	2	3	104
	NOTE: A "*" indicates RL Property mitigation has occurred (i.e., demo, elevation, etc.).				

Table 4: RL Property Flood Hazard Summary and Insured Status					
RLP ID #	Flooding Source	Cause of Flooding	Flood Zone	Pre-Firm?	Insured?
1	Big Sur River	Hillside runoff.	A & X	Y	N
2*	Calera Creek	Riverine flooding.	AE & X	N	Y
3	Coastal Flooding	Coastal flooding.	X	Y	N
4	Carmel River	Riverine flooding (Carmel Lagoon).	AE	Y	N
5	Carmel River	Riverine flooding (Mission Fields-CSA 50).	AE	Y	N
6	Carmel River	Riverine flooding (Mission Fields-CSA 50).	AE	Y	Y
7	Carmel River	Riverine flooding (Mission Fields-CSA 50).	AE	Y	N
8 - 12	Carmel River	Riverine flooding (Mission Fields-CSA 50).	AE	Y	Y
13	Carmel River	Riverine flooding (Mission Fields-CSA 50).	AE	Y	N
14 - 18	Carmel River	Riverine flooding (Mission Fields-CSA 50).	AE	Y	Y
19	Carmel River	Riverine flooding (Mission Fields-CSA 50).	AE	Y	N
20 - 25	Carmel River	Riverine flooding (Mission Fields-CSA 50).	AE	Y	Y
26	Carmel River	Riverine flooding (Mission Fields-CSA 50).	AE	Y	N
27 - 35	Carmel River	Riverine flooding (Mission Fields-CSA 50).	AE	Y	Y
36	Carmel River	Riverine flooding (Mission Fields-CSA 50).	AE	Y	N
37 - 43	Carmel River	Riverine flooding (Mission Fields-CSA 50).	AE	Y	Y
44 - 45	Carmel River	Riverine flooding (Mission Fields-CSA 50).	AE	Y	N
46 - 52	Carmel River	Riverine flooding (Mission Fields-CSA 50).	AE	Y	Y
53	Carmel River	Riverine flooding (Mission Fields-CSA 50).	AE	Y	N
54 - 64	Carmel River	Riverine flooding (Mission Fields-CSA 50).	AE	Y	Y
65	Carmel River	Riverine flooding (Mission Fields-CSA 50).	AE	Y	N
66 - 67	Carmel River	Riverine flooding (Mission Fields-CSA 50).	AE	Y	Y
68	Carmel River	Riverine flooding (Mission Fields-CSA 50).	AE	Y	N
69 - 72	Carmel River	Riverine flooding (Mission Fields-CSA 50).	AE	Y	Y
73	Carmel River	Riverine flooding.	AE & X	Y	Y
74	Carmel River	Riverine flooding.	AE	Y	Y
75	Carmel River	Riverine flooding.	AE & Floodway	Y	Y
76	Carmel River	Lowest floor nearly 3' below BFE.	AE	Y	Y
77	Carmel River	Hillside runoff.	X	Y	N
78	Carmel River	Riverine flooding.	AE & Floodway	Y	N
79	Carmel River	Riverine flooding. Stairs into river.	AE, X & Floodway	Y	Y
80	Carmel River	Riverine flooding.	AE & Floodway	Y	Y
81	Carmel River	Riverine flooding.	AE & Floodway	Y	N
82*	Carmel River	Riverine flooding. (Elevation underway)	AE & Floodway	Y	N
83-84	Carmel River	Riverine flooding.	AE & Floodway	Y	N
85	Carmel River	Riverine flooding.	AE & Floodway	Y	Y
86	Carmel River	Riverine flooding.	AE & X	Y	N
87*	Carmel River	Riverine flooding. (LFE > 1 foot above BFE).	AE & X	Y	Y

88	Carmel River	Riverine flooding.	AE, X, & Floodway	Y	Y
89	Carmel River	Riverine flooding.	AE	Y	N
90	Carmel River	Riverine flooding.	AE & Floodway	N	Y
91	Carmel River	Riverine flooding.	AE & Floodway	Y	Y
92-93	Carmel River	Riverine flooding.	AE & Floodway	Y	Y
94	Carmel River	Riverine flooding.	A & X	Y	N
95-96	Carneros Creek	Riverine flooding.	AE, X & Floodway	Y	N
97	Castroville Blvd Wash	Riverine flooding.	AE, X, & Floodway	Y	N
98	El Toro Creek	Riverine flooding (sedimentation of channel).	X	Y	N
99	El Toro Creek	Riverine flooding (sedimentation of channel).	AE & Floodway	Y	Y
100	Paloma Creek	Riverine flooding.	X	Y	Y
101	Pebble Beach	Debris clogged street area drains.	X	Y	N
102	Pebble Beach Localized Flooding	Debris clogged culvert under Stevenson Drive.	X	Y	N
103*	Piney Creek	Riverine flooding.	A & X	Y	N
104	Ralph Lane Channel	Riverine flooding (sedimentation of channel).	X	Y	Y
105	San Miguel Canyon	Riverine flooding.	AE	Y	N
106 - 107	Santa Rita Creek.	Riverine flooding.	AE	Y	N
108 - 109	Carmel River	Riverine flooding. (Carmel Lagoon).	AE	Y	N
NOTES: * Indicates property has been mitigated, as per FEMA form AW-501, dated 12/31/2013.					

Big Sur River RL Area

The owner of RL Property No. 1 explained to the MCWRA staff that the 1982 and 1983 flood damages to the pre-FIRM commercial structure were caused by hillside drainage, not the Big Sur River. After the 1983 flood, the property owner installed drainage improvements to convey storm water runoff around the structure. According to the property owner, the building has not flooded since 1983. This RL Area contains three additional properties which are subject to similar flooding sources.

Calera Creek RL Area

RL Property No. 2 is a post-FIRM structure located within the FEMA-designated 100-year floodplain of Calera Creek. The structure was damaged in March 1995 and February 1998. The MCWRA reviewed the discretionary permit application for the single-family dwelling in April 1987. As part of the permitting process, the applicant was required to elevate the lowest floor one foot above the base flood elevation. The MCWRA does not have a FEMA Elevation Certificate on file for this property; therefore, it cannot be determined if the building was constructed in accordance with

County floodplain regulations. However, as per FEMA form AW-501 this property is recognized as being mitigated as of November 10, 2010, by means of elevation through a property owner-funded project (see Table 5). This RL Area contains eight additional properties which are subject to similar flooding sources.

Carmel Highlands Coastal Flooding RL Area

RL Property No. 3 is a pre-FIRM structure located on a high bluff above the Pacific Ocean. Although the parcel is located within Zone X, the structure was damaged from wind and wave action. After reviewing GIS maps and aerial photographs, it appears the damaged structure is located outside of the County-identified parcel, near the bluff, in an area designated Zone A. This RL Area contains eight additional properties which are subject to similar flooding sources.

Carmel River RL Area (located within the Lagoon and CSA-50)

There are 3 RL Properties located in the Lagoon area and 68 RL Properties located within CSA-50. The area is located extends appropriately one mile upstream of the Carmel River mouth. As shown on the effective FIRM, the entire area is located within the 100-year floodplain. Every RL Property is a pre-FIRM building. The only 2 additional RL Properties added since the FMP 2008 Update are located in this area (RL Property Nos. 108 & 109). On January 5, 2008, flows in the Carmel River, at the USGS gage near Carmel, reached 8,270 cfs. The coastal flooding from this event resulted in two flood insurance claims being made from two separate properties. Both claims were associated with pre-FIRM structures. These properties are identified in Appendix A, Carmel River, and the associated RL Property tables have been updated. Monterey County is undertaking three projects in the lower Carmel River area that will help serve to mitigate the RL Properties in this area (see Section 10.6 Flood Control Projects). The feasibility analysis shows mitigation of RL Properties Nos. 71 and 72 difficult without expending large amounts of money because of the way the parcels are oriented between the Carmel River and one of the existing levees. This orientation makes including the RL Properties in the project very expensive. Instead, structural elevation is the preferred method of mitigation for RL Properties Nos. 71 and 72. The MCWRA successfully secured an FMA grant for RL Property No. 72, which is a known severe repetitive loss property constructed more than 4 below the base flood elevation. In June 2015, structural elevation was completed and the flood-prone residence is now elevated one foot above the base flood elevation and flood-vented in accordance with County floodplain regulations. This RL Area contains 464 additional properties which are subject to similar flooding sources.

Carmel River (Outside CSA-50) RL Area

There are 25 RL Properties located outside of CSA-50 that were damaged as the result of Carmel River flooding. Most of the buildings are located within the FEMA-designated 100-year floodplain. Every building, with the exception of RL Property No. 88, is a pre-FIRM structure. The MCWRA has a FEMA Elevation Certificate on file for this structure indicating the principal floor is elevated on full-story foundation walls. The floods of 1995 and 1998 resulted in the only two losses incurred by the majority of these properties. RL Property No. 87 is located in this area. As per FEMA form AW-501, this property was mitigated by a property owner-funded project that elevated the structure (See Table 5). This RL Area contains 658 additional properties which are subject to similar flooding sources.

Carneros Creek RL Area

RL Properties No. 95 and 96 are both pre-FIRM structures located within the SFHA of Carneros Creek. Both buildings were damaged when the creek overtopped its banks during January 1997 and February 1998. Additionally, RL Property No. 96 was damaged in March 1995 and February 2000 flooding. The current owner of RL Property No. 96 is increasing the length and height of an existing three-foot high floodwall to divert floodwater away from the structure. This RL Area contains two additional properties which are subject to similar flooding sources.

Castroville Boulevard Wash RL Area

RL Property No. 97 is a pre-FIRM structure located in the floodway portion of the FEMA-designated 100-year floodplain of Castroville Boulevard Wash. The structure was damaged in 1995, 1996, 1997, & 1998. This RL Area contains 12 additional properties which are subject to similar flooding sources.

El Toro Creek RL Area

RL Properties No. 98 and 99 are multi-family dwelling units, in the Creekside Condominium complex, located on El Toro Creek approximately half a mile from the confluence with the Salinas River. Both RL Properties are pre-FIRM structures that were damaged by the March 1995 and February 1998 floods. This RL Area contains 29 additional properties which are subject to similar flooding sources.

Pebble Beach Localized Flooding RL Area

Both Pebble Beach RL Properties are pre-FIRM structures located in flood hazard Zone X.

RL Property No. 101 received flood losses in December 1979 and January 1981 resulting from a clogged catch basin in front of the Chevron station on 17 Mile Drive. According to the Pebble Beach Company Property Services and Resource Management Office, stormwater unexpectedly washed away wood chips from a Peter Hay Golf Course path. After the floods, the Pebble Beach Company removed the debris from the catch basin and installed drainage improvements. The property has not flooded since 1981.

RL Property No. 102 received flood damages resulting from clogged street drains. According to the Pebble Beach Company staff, woody debris clogged the invert to the storm drain under Stevenson Drive in 1993. This resulted in a diversion of floodwater toward the residence. The debris in the manhole was removed; however, flooding occurred again in 1998. After the 1998 floods, the Pebble Beach Company installed an asphalt berm and a new catch basin on Stevenson Drive. Water draining into the catch basin is conveyed through a new 15-inch storm drain installed under the driveway of RL Property No. 104. This storm drain line replaced a 12-inch line that was connected to the 12-inch storm drain under Stevenson Drive. This RL Area contains no other additional properties which are subject to similar flooding sources.

Paloma/Piney Creek RL Area

RL Property No. 100 is a pre-FIRM building located in Zone X as shown on the FIRM. FEMA defined a 100-year floodplain for a small portion of Paloma Creek; however, the approximate study did not extend upstream to this parcel. Flooding damaged the building in March 1995 and February 1998.

The MCWRA staff visited RL Property No. 103 on July 30, 2002. According to the property owner, who also lived on the property in 1978 when both losses occurred, Piney Creek was clogged with debris in 1995. The obstructions diverted floodwaters toward the building resulting in severe structural damage. The building was demolished after the 1995 flood. This RL Area contains 10 additional properties which are subject to similar flooding sources.

Ralph Lane Channel RL Area

RL Property No. 104 is a pre-FIRM structure that was damaged in December 1996 and February 1998. The structure is located adjacent to the Ralph Lane Channel in Zone X. FEMA did not prepare a detailed or approximate study for this area. This RL Area contains 23 additional properties which are subject to similar flooding sources.

San Miguel Canyon Creek RL Area

RL Property No. 105 is a pre-FIRM structure located within the FEMA designated 100-year floodplain of San Miguel Canyon Creek. The losses resulted from flooding that occurred in February 1998 and February 2002. This RL Area contains 30 additional properties which are subject to similar flooding sources.

Santa Rita Creek RL Area

RL Properties No. 106 and 107 are both are both pre-FIRM structures located within the FEMA designated 100-year floodplain of Santa Rita Creek. RL Property No. 106 was damaged in January 1993 and March 1995. RL Property No. 107 experienced flood losses in January 1993, January 1995, March 1995, and December 1996. Recent floods in December 2014 inundated this RL Area with 2 feet of floodwater. A total of 13 residences were flooded. In addition, the flood waters posed a significant health hazard due to a septic system back up which contaminated all the water on the ground. The cause of flooding was an irrigation ditch that breached its levy in two different locations. This RL Area contains 64 additional properties which are subject to similar flooding sources.

12.2 Mitigation Options

For close to a decade, the County has understood the primary and secondary flood mitigation solutions for 109 RL Properties (as shown in table 5). These mitigation solutions were determined by the Repetitive Loss Property Assessment for Monterey County prepared by URS Corporation, dated 10/11/2005. This assessment was funded by FEMA Pre-Disaster Mitigation program grant funds and administered by FEMA Region IX. The assessment included a technical memorandum and a repetitive loss database to help assist the County in its floodplain management planning efforts. These solutions were recommended by URS who determined the flooding problem, the

Table 5: RL Property Mitigation Solutions			
RL ID #	Primary Solution	Secondary Solution	Grant Eligible
1	Drainage Improvements	Convey Runoff to Street	N
2	Mitigated	N/A	N/A
3	Relocate Away From Bluff	Acquisition	N
4 - 72	LCR Flood Control Project	Elevate LF 1'	Y
73	Elevate LF 1'	Acquisition	Y
74	Elevate LF 1'	Acquisition	Y
75	Elevate LF 1'	Acquisition	Y
76	Elevate LF 1'	Acquisition	Y
77	Elevate LF 1'	Acquisition	Y
78	Elevate LF 1'	Acquisition	Y
79	Elevate LF 1'	Acquisition	Y
80	Elevate LF 1'	Acquisition	N
81	Elevate LF 1'	Acquisition	Y
82	Elevate LF 1'	Acquisition	Y
83	Elevate LF 1'	Acquisition	N
84	Elevate LF 1'	Acquisition	N
85	Elevate LF 1'	Acquisition	Y
86	Elevate LF 1'	Acquisition	N
87	Mitigated	N/A	N/A
88	Elevate LF 1'	Acquisition	N
89	Elevate LF 1'	Acquisition	Y
90	Wet floodproof garage	No Alternative Available	Y
91	Structure Removed. New structure's LFE 2' above BFE		N/A
92	Elevate LF 1'	Acquisition	Y
93	Elevate LF 1'	Acquisition	Y
94	Elevate LF 1'	Acquisition	Y
95	Elevate LF 1'	Acquisition	N
96	Elevate LF 1'	Acquisition	N
97	Elevate LF 1'	Acquisition	N
98	Elevate LF 1'	Acquisition	Y
99	Elevate LF 1'	Acquisition	N
100	Elevate LF 1'	Acquisition	N
101-102	Drainage Issue Resolved	N/A	N
103	Structure Removed after 1995 flood.		N/A
104	Elevate LF 1'	Acquisition	Y
105	Elevate LF 1'	Acquisition	Y
106-107	Elevate LF 1'	Acquisition	N
108-109	Elevate LF 1'	Acquisition	N

building type and condition, and if any proposed flood control projects were planned near the properties. The assessment has allowed property owners and the County to look at alternatives and decide which approach might be most beneficial depending of funding sources. The County has determined FEMA Flood Mitigation Assistance (FMA) program grants, as discussed in Chapter 7, area reliable source of funding for individual flood mitigation projects.

In 2011, Monterey County received its first FMA grant with funds totaling $205,397 to elevate RL Property No. 72. The structure was one of six structures on FEMA's severe repetitive loss list for Monterey County. The property owner and the MCWRA worked together for over a year to successfully complete this project. In addition to flood hazard benefits, the structural elevation will reduce any potential significant increases to the flood insurance premium. If left unmitigated, the property owner would have faced significant increases due to federal legislation passed in March 2014 referred to as the Homeowners Flood Insurance Affordability Act (HFIAA).

As it is being implemented, HFIAA is now increasing the pre-FIRM rates for severe repetitive loss properties by 25% each year until full-risk rates are reached. Therefore, because of the severe repetitive loss status, the premium would have increased from approximately $1,200 per year to $10,800. This premium represents the full risk rate for a structure at five feet below the base flood elevation in a FEMA AE zone. The property owner has expressed much gratitude for the time the County dedicated toward his project. Through this process, the MCWRA now has experience and expertise in administering FMA program grants and providing flood mitigation assistance to property owners.

12.3 Repetitive Loss Area Outreach Project

As a CRS Category C community, Monterey County is responsible for implementing an annual outreach project to the properties within the mapped repetitive loss areas. The outreach project must advise recipients of four things:

- that the property is in or near an area subject to flooding;
- what property protection measures are appropriate for the flood situation;
- what sources of financial assistance may be available for property protection measures; and
- basic facts about flood insurance

The MCWRA completes this annual requirement by targeting all 1,420 parcels located within designated RL Areas and mailing out the informational letters in coordination with Winter Storm Preparedness Week.

13. Flood Hazard Mitigation Goals and Action Plan

This part of the FMP 2014 Update presents the broad goals of flood hazard mitigation as they relate to the County's MJHMP. These goals have been used to develop a plan with specific actions for achieving flood risk reduction and promoting floodplain management strategies throughout the County and to improve the County's NFIP/CRS program rating[14]. It's important to note, FEMA officials say there's been a renewed interest in the program as a result of the forthcoming rate increases tied to the NFIP reform efforts.

Goal #1: Promote disaster-resistance strategies in future development.

Goal #2: Retrofit, reinforce, or otherwise protect existing community assets, especially critical infrastructure, for hazard resilience.

Goal #3: Encourage natural systems protection through plans and policies; vegetation, debris, and sediment control measures; maintenance and restoration programs; ecosystem services; and other activities for areas such as the Salinas and Carmel Rivers and the Monterey County coast.

Goal #4: Provide regulatory tools for applicable hazards and integrate flood hazard mitigation principles into appropriate local plans.

Goal #5: Increase public education and awareness on flood hazard risks and available mitigation techniques for reducing risk; and build and support personal preparedness to enable the public to better prepare for, respond to, and recover from disasters.

Goal #6: Improve local government capacity for disaster resiliency; facilitate coordination between participating jurisdictions and state and federal agencies, local utility companies, local businesses, non-profit organizations, and other stakeholders to promote flood hazard risk reduction.

13.1 Administrative Action Items

- **Action # 1 –** Plan Adoption: Adopt an updated FMP every five years.
- **Action # 2 –** Monitoring and Reporting: Adopt an FMP Annual Report every year.
- **Action # 3 –** CRS: Facilitate a successful CRS recertification visit by organizing and documenting activities in the County's floodplain management program a minimum of one year before the ISO/CRS visit.

13.2 Program Action Items

- **Action # 4 –** Review existing free board regulations to ensure the most current and beneficial CRS program guidelines are being implemented. (Chapter 6 - Prevention).
- **Action # 5 –** Review existing fill regulations as they relate to the floodplain to ensure the most current and beneficial CRS program guidelines are being implemented. (Chapter 6 - Prevention).

[14] The 2010 Monterey County General Plan Flood Hazard Goal S-2, Policy S-2.4, states, "Monterey County shall strive to improve its National Flood Insurance Program Community Rating System classification."

- **Action # 6 –** Review existing drainage and flood control regulations to ensure the most current and beneficial CRS program guidelines are being implemented. (Chapter 6 - Prevention).
- **Action # 7 –** Property protection funding: Develop a flood control strategy that ensures coordination and funding between Federal, State, and/or local agencies to provide assistance to flood prone properties and RL Areas. (Chapters 7, 12 – Property Protection and RL Areas).
- **Action # 8 –** Flood control projects: Develop project proposals to reduce flooding and improve flood control in flood-prone areas. (Chapter 10 – Structural Projects).
- **Action # 9 –** Drainage system maintenance: Develop a GIS map of all County-maintained drainage facilities and document maintenance in the field using a collector software program. (Chapter 10 – Structural Projects).

13.3 Public Information Action Items

- **Action # 10 –** Improve public information by providing more flood protection information via the MCWRA website. (Chapter 11 – Public Information).

13.4 FMP 2014 Update Recommendations

The CRS program encourages communities to engage in efforts to make flood-prone areas more disaster resilient by offering important premium discounts. Participating NFIP/CRS communities such as unincorporated Monterey County can earn credit and savings for flood insurance policy holders by undertaking a variety of flood reduction measures. CRS Program creditable activities are grouped into four categories:

- Public Information (Activity 300)
- Mapping and Regulation (Activity 400)
- Flood Damage Reduction (Activity 500)
- Warning and Response (Activity 600)

The highest score credited to Monterey County by the NFIP CRS program was a Class 5 rating which was effective from 5/1/2007 through 3/30/2015. This rating resulted in $4,040,000 in flood insurance savings to residences and businesses over a 7 year period. Recently, the CRS rating was retrograded to a Class 7 in 4/1/2015 resulting in an approximate 10% reduction in flood insurance premium savings. This makes the projected savings for a 5 year rating cycle approximately $2,070,000.

As of 12/31/2014, there were 1,627 flood insurance policies inforce throughout Monterey County. Many of the highest premiums are paid by non-residential property owners where premiums can cost between $10,000 - $12,000 per year. For example, the average non-residential flood insurance premium in the community of Pajaro is $12,290 per year. In comparison the average flood insurance premium countywide for a property in the Special Flood Hazard Area is approximately $1,505. For these reasons, the FMP 2014 Update includes recommendations to earn credit towards an improved CRS class rating at the next cycle audit in 2019. These recommendations are shown in table 6 and aligned with the MJHMP in table 7.

Table 6: FMP Recommendation and CRS credit points				
Action # and CRS category	**Recommendation**	**Consistent with 2010 Mo Co GPU policy(ies)**	**CRS Points if Implemented**	
			Current	Proposed
Action #1, 2, 3 *CRS 500*	Continue adoption of an updated FMP every five years, adopt an FMP Annual Report every year, and facilitate a successful CRS recertification visit by organizing and documenting activities in the County's floodplain management program a minimum of one year before the ISO/CRS visit. **(Required for continued participation in the NFIP/CRS Program)**	**S-2.4**	**n/a**	**n/a**
Action #4 *CRS 400*	The County should adopt a 2-foot "freeboard protection" requiring buildings to be elevated to a level higher than the 100-year flood elevation by amending Chapter 16.16. This action would further reduce flood hazards and improve the County's CRS rating. **(CRS 430: Higher Regulatory Standards)**	**S-2.3, S-2.4, S-2.10**	**100**	**225**
Action #5 *CRS 400*	The County should prohibit fill within the FEMA floodplain or the flood fridge including construction of buildings on fill and/or, the County should require that new developments provide compensatory storage at hydraulically equivalents sites by amending Chapter 16.16. This action would further reduce flood hazards and improve the County's CRS rating. **(CRS 430: Higher Regulatory Standards)**	**S-2.1, S-2.3, S-2.4, S-2.8**	**0**	**280**
Action #6 *CRS 400*	The County is currently preparing a drainage manual that will include runoff performance standards addressing several Monterey County General Plan policies. The County should consider incorporating elements of CRS Activity 450 stormwater management into the drainage manual for additional CRS benefits. This action would further reduce flood hazards and improve the County's CRS rating. **(CRS 450 Stormwater Management)**	**S-2.3, S-2.4, S-3.1, S-3.3, S-3.4, S-3.7**	**0**	**140**
Action #7 *CRS 300*	The County should continue to provide resources to administer the FMA grant program on behalf of flood-prone residences and businesses. This action will facilitate federal funds being available for flood mitigation activities such as structural elevation and reduce overall risks to ongoing flood hazards. This action would further reduce flood hazards and improve the County's CRS rating. **(CRS Activity 360 Flood Protection Assistance)**	**S-2.4**	**0**	**75**
Action #8 *CRS 500*	The County should continue developing flood control project proposals to reduce flooding and improve flood control in flood prone areas. Specific areas include improvements on the Lower Carmel River, the Pajaro River near the community of Pajaro, the MCWRA Zone 9 Reclamation Ditch, Bryant Canyon Channel, and adding storage capacity to Nacimiento and San Antonio Reservoirs through the Interlake Tunnel Project. This action would further reduce flood hazards and improve the County's CRS rating. **(CRS Activity 530)**	**S-2.4**	**0**	**160**

Action #9 *CRS 500*	The County should develop a GIS map showing the number of conveyance system components inspected and maintained by the MCWRA and RMA-Public Works Department; and, the total number of conveyance system components in the developed portion of the community's drainage system. This action would further reduce flood hazards and improve the County's CRS rating. **(CRS Activity 540 Drainage System Maintenance)**	S-2.4	0	200
Action #10 *CRS 300*	Improve public information by providing more flood protection information via the MCWRA website. This action would further reduce flood hazards and improve the County's CRS rating. **(CRS Activity 350 Flood Protection Information)**	S-2.4	0	60
		subtotal	100	1,140
Additional CRS points if recommendations are implemented				**1,040**

Table 7: Action Items, Recommendations, and Goals

Action Item #	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5	Goal #6	Chapter	Deadline
Administrative Action Items								
# 1. Plan Adoption (MCWRA)	X	X	X	X	X	X		9/8/2015; 10/1/2019
# 2. Montoring and reporting (MCWRA)	X	X	X	X	X	X		9/15 each year
# 3. CRS (*next visit 9/1/2018) (MCWRA)	X	X	X	X	X	X		9/1/2017
Program Action Items								
# 4. Regulatory review (free board requirement)(MCWRA)	X	X		X	X		6	No later than 2019 CRS audit
# 5. Regulatory review (prohibit fill in the floodplain) (MCWRA)	X	X		X	X		6	No later than 2019 CRS audit
# 6. Regulatory review (drainage manual)(RMA-ES)	X	X		X	X		6	No later than 2019 CRS audit
# 7. Property protection funding from FEMA (MCWRA)		X			X	X	7, 12	6/01 each year
# 8. Implement flood control projects (MCWRA & RMA)		X	X		X	X	10	Ongoing
# 8. Drainage system map & maintenance (MCWRA & RMA)		X	X		X	X	10	8/15 each year
Public Information Action Items								
# 10. Public information (flood protection website) (MCWRA)	X	X			X	X	11	10/01 each year

14. Plan Adoption

The FMP 2014 Update was presented to the MCWRA Board of Directors' Planning Committee on August 19, 2015. The Planning Committee unanimously recommended approval to the Board of Directors. On August 27, 2015, the MCWRA Board of Directors considered the FMP 2014 Update and directed staff to meet with and have the plan reviewed by the Monterey County Resource Management Agency (RMA). On September 3, 2015, the MCWRA staff met with Carl Holm, Director RMA; Jacqueline Onciano, Manager RMA-Planning; Tom Moss, Senior Hydrologist-RMA Environmental Services; Enrique Saavedra, Assistant Director RMA-Public Works, and (by phone) Melanie Beretti, Program Program Manager RMA to discuss the BOD concerns. On September 9, 2015, the MCWRA staff met a second time with Ms. Onciano to discuss the specific FMP recommendations to determine consistency with the 2010 Monterey County General Plan. Ms. Onciano recommended developing a section with a table to highlight GPU consistency and the CRS credit benefits of implementing specific recommendations. MCWRA staff revised the FMP to include Ms. Onciano's recommendations. Furthermore, on September 14, 2015, the RMA-Environmental Services Department submitted comments on the FMP as related to grading and storm water. The RMA comments were received by MCWRA staff and the FMP was revised to incorporate the recommendations. The FMP is scheduled for consideration at the November 2, 2015 joint MCWRA BOD/BOS meeting. Contingent upon the MCWRA BOD/BOS's action, the FMP 2014 Update will be scheduled for consideration and adoption by the Monterey County BOS in November 2015.

15. Plan Implementation, Evaluation, and Revisions

The MCWRA will prepare a FMP annual report by September 15 of each year to include an overview of the FMP and the progress made during the duration of those 12 months. The FMP will be updated every five years in accordance with the requirements outlined in the effective CRS Coordinator's Manual. The next update is tentative scheduled to be completed in 2019. If Monterey County decides to pursue an improved NFIP/CRS program class rating, then the recommendations in Chapter 13 should be considered for implementation to increase the credit point total. In this case, the MCWRA will continue to work with other County departments as necessary to implement the flood hazard action items and recommendations outlined in the action plan.

16. References

AECOM with assistance from the Monterey County Planning Team and various cities, August 2014. Monterey County Multi-jurisdictional Hazard Mitigation Plan.

California Department of Finance, January 2013. Report P-1: Summary Population Projections by Race/Ethnicity and by Major Age Groups

Corps of Engineers, U. S. Army, 1967. *Flood Plain Information, Carmel River, Monterey County, California.* Prepared for County of Monterey.

Denise Duffy & Associates, Inc., on behalf of County of Monterey Resource Management Agency, April 2014. Carmel Lagoon Ecosystem Protective Barrier, Scenic Road Protection Structure, and Interim Sandbar Management Plan Project, Draft Biological Assessment.

Creegan + D'Angelo, Pacific Municipal Consultants, 1996. *Monterey County Flood Hazard Mitigation Plan.* Prepared for County of Monterey Office of Emergency Services.

Federal Emergency Management Agency, April 2, 2009. *Flood Insurance Study, Monterey County, California, And Incorporated Areas, Volume 1 of 3.*

Federal Emergency Management Agency, April 2, 2009. Digital Flood Insurance Rate Maps

Federal Emergency Management Agency Official Webpage, www.fema.gov, Flood Insurance Reform.

Federal Emergency Management Agency, Department of Homeland Security, July 12, 2013. Hazard Mitigation Assistance Unified Guidance

GEI Consultants, Inc., 2001. *Probable Maximum Flood Hydrology Report for Nacimiento Reservoir, Counties of San Luis Obispo and Monterey, California*. Prepared for Monterey County Water Resources Agency.

Monterey County Board of Supervisors, July 30, 2013.Board Order, Agreement No.: A-12543.

Monterey County Economic Development Department, 2010. At A Glance: Population and Housing

Monterey County Planning Department, 1983. *Big Sur River Protected Waterway Management Plan*.

Monterey County Resource Management Agency, June 20, 2014. Letter to CSA-50 property owners, County Service Area 50 Flood Control Study Community Update

Monterey County Surveyors, Inc., Koretsky King Associates, Inc., 1973. *Monterey County Master Drainage Plan, Carmel Valley Watersheds*. Prepared for Monterey County Flood Control and Water Conservation District.

-----, 1974. *Monterey County Master Drainage Plan, El Toro Creek Watershed*. Prepared for Monterey County Flood Control and Water Conservation District.

-----, 1975. *Monterey County Master Drainage Plan, Lower Carmel Valley Watersheds*. Prepared for Monterey County Flood Control and Water Conservation District.

Monterey County Surveyors, Inc., McCreary Koretsky International, Inc., 1972. *Monterey County Master Drainage Plan, Santa Rita Creek Watershed*. Prepared for Monterey County Flood Control and Water Conservation District.

Monterey County Water Resources Agency, 2000. *Emergency Action Plan for Nacimiento Dam, Project Number 6378*.

-----, 2001. *San Antonio Dam Operation Policy*.

Monterey County Water Resources Agency, Salinas Valley Water Project, Nacimiento Dam Spillway Modification Project Background.

Moss, Chris, 1995. *Lower El Toro Creek Sediment Removal Project, 401 Water Quality Certification Application*. Prepared for Monterey County Water Resources Agency.

National Flood Insurance Program Official Webpage, www.floodsmart.gov, Biggert-Waters Reform Act of 2012 Update.

National Oceanic & Atmospheric Administration, National Tsunami Warning Center, Tsunami Brochure

Nolte and Associates, 1989. *Lower Carmel River Flood Control Project, Engineering Report*. Prepared for Monterey County Water Resources Agency.

Philip Williams & Associates, Ltd., 2002. *Lower Carmel River Flood Control Project, Draft Final Report*. Prepared for Monterey County Water Resources Agency, County Services Area 50.

Northwest Hydraulic Consultants, 2004. *Calera Creek Flood Insurance Study Hydrology Report*. Prepared for FEMA.

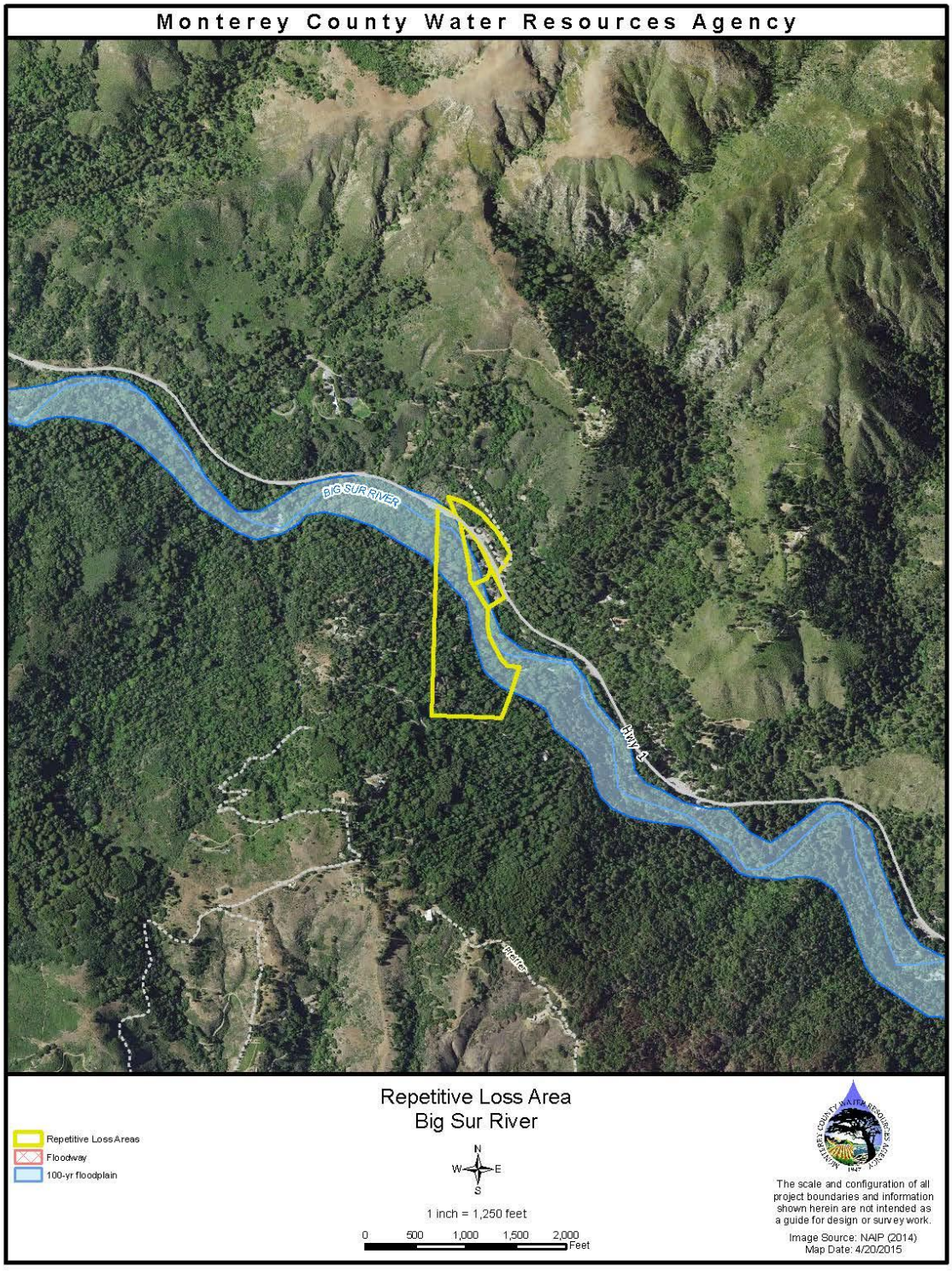
Northwest Hydraulic Consultants, 2006. *Carmel River Flood Insurance Study Hydrology Report*. Prepared for FEMA.

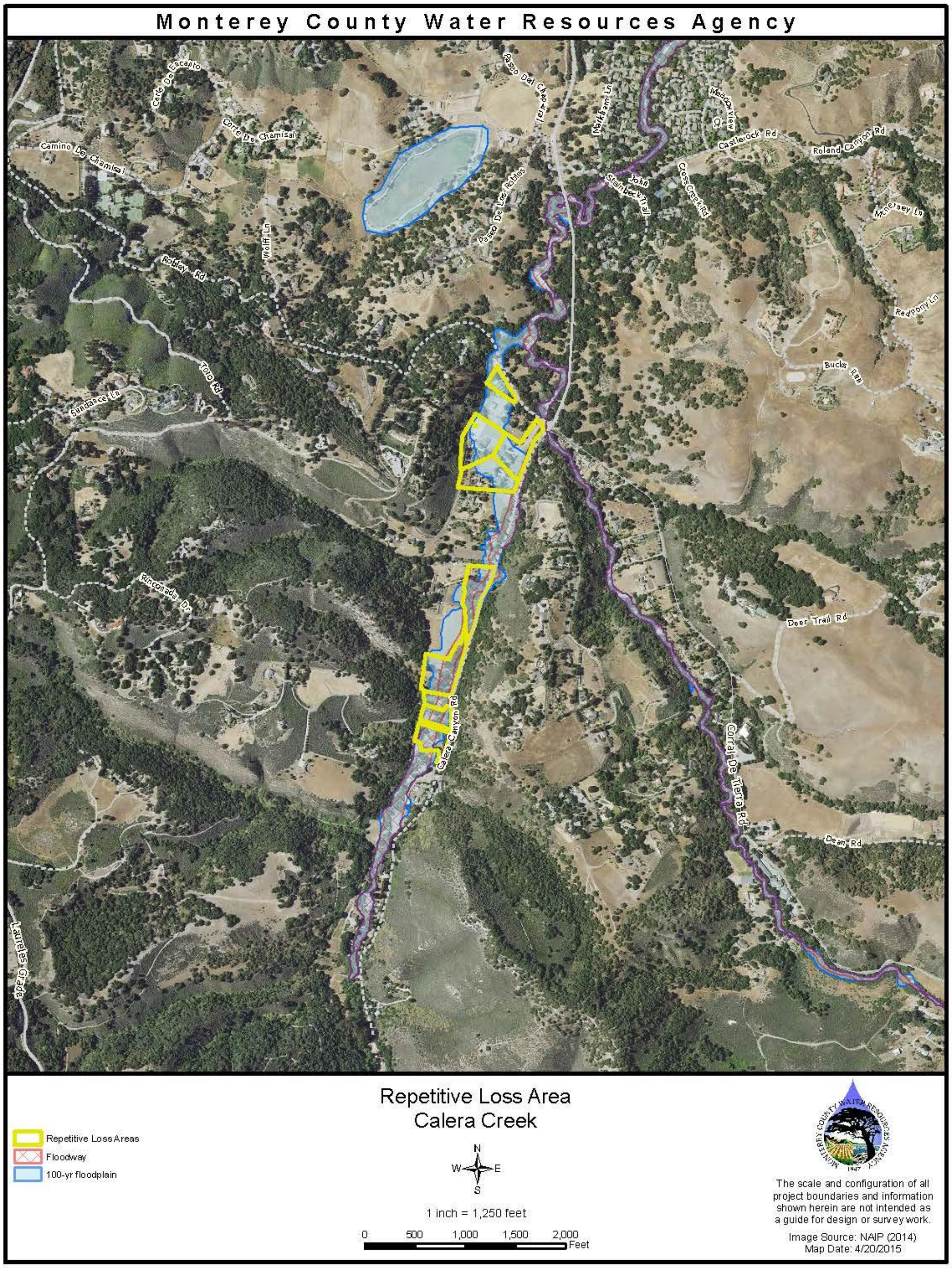
Reclamation Ditch Improvement Plan Advisory Committee, 2002. *Reclamation Ditch Improvement Plan Recommendations*. Prepared for Monterey County Water Resources Agency.

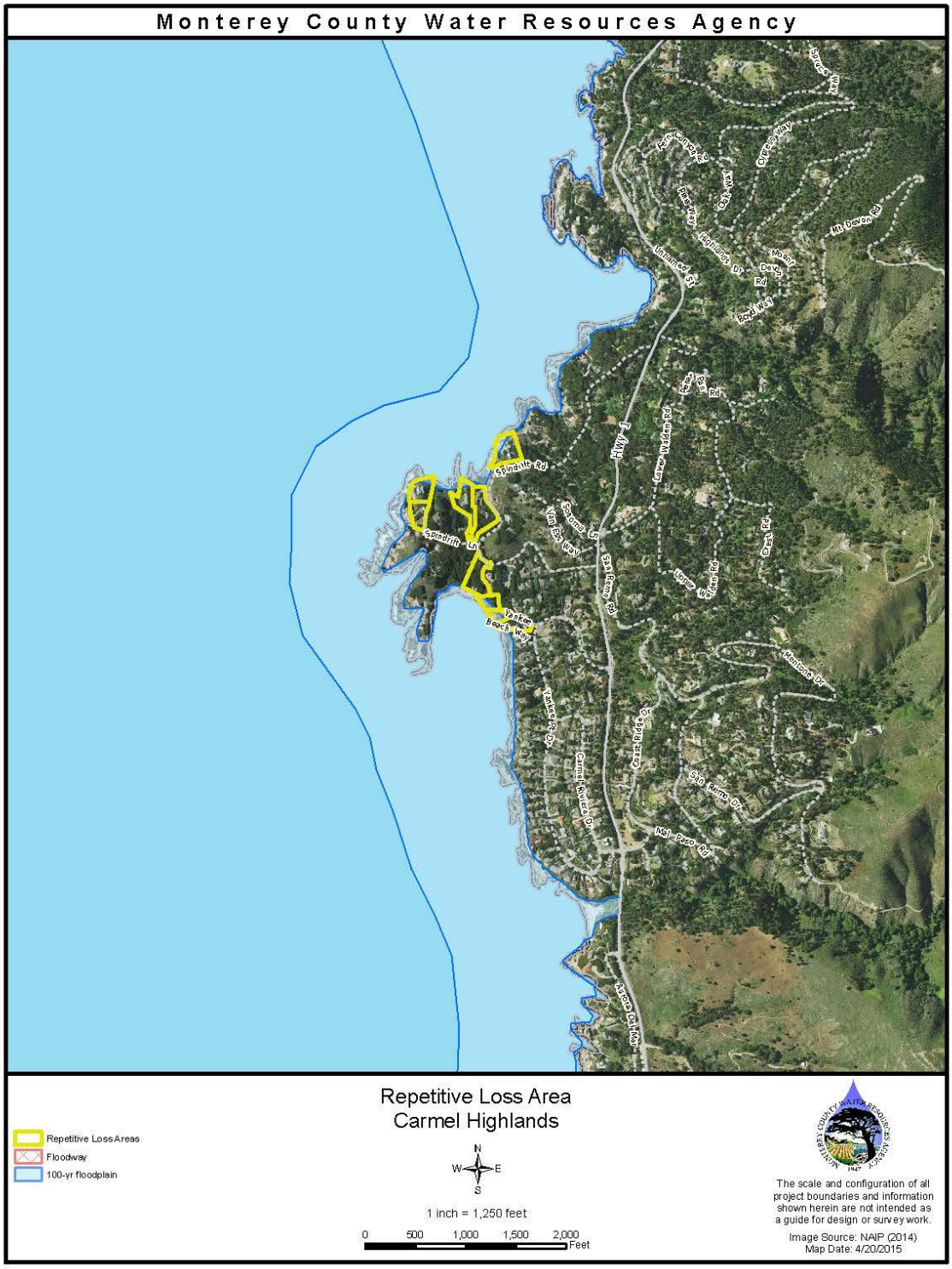
URS Corporation, 2005. *Repetitive Loss Property Assessment for Monterey County*. Prepared for Monterey County Water Resources Agency.

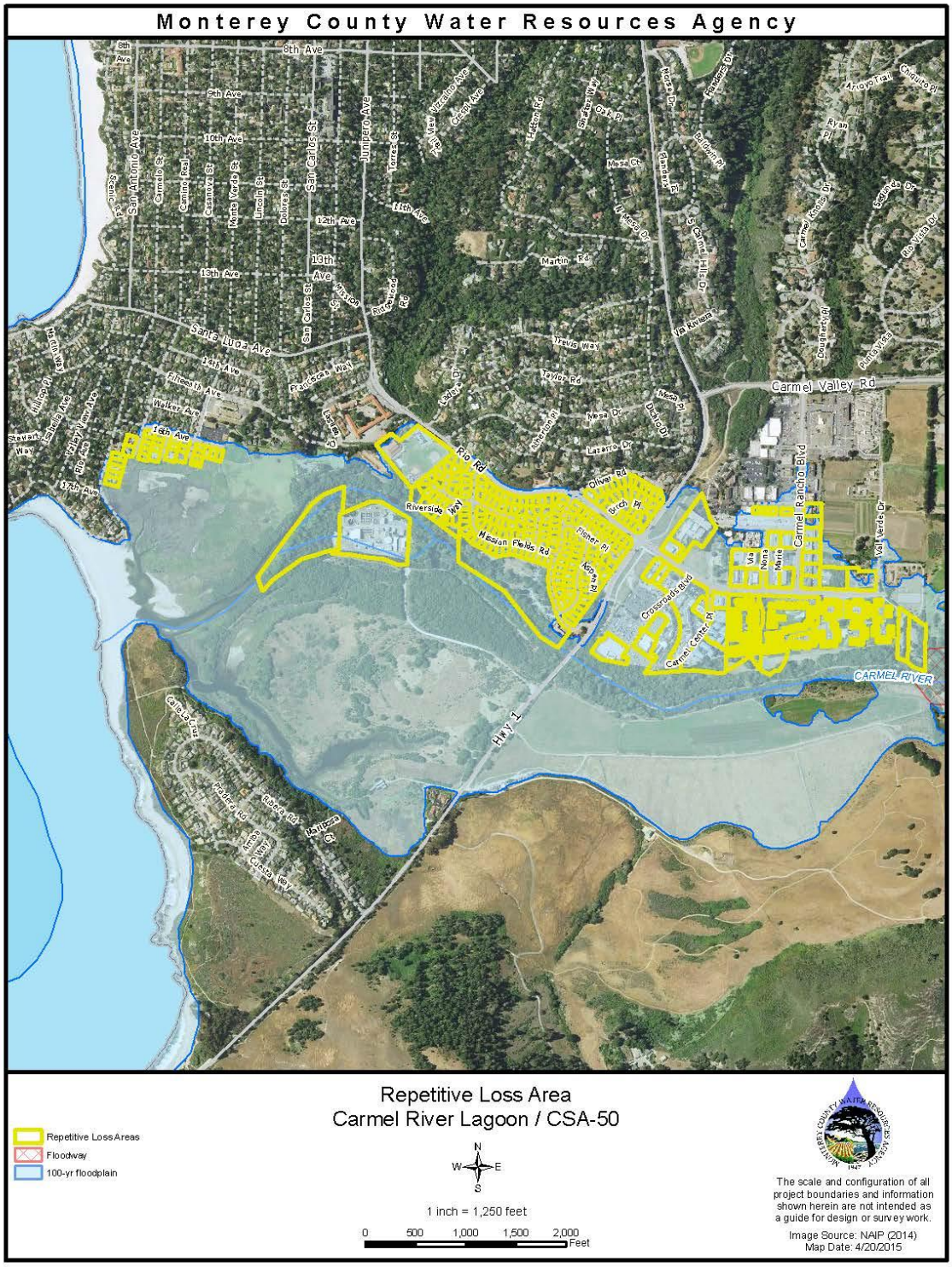
U.S. Department of Homeland Security, National Preparedness Goal, First Edition, September 2011.

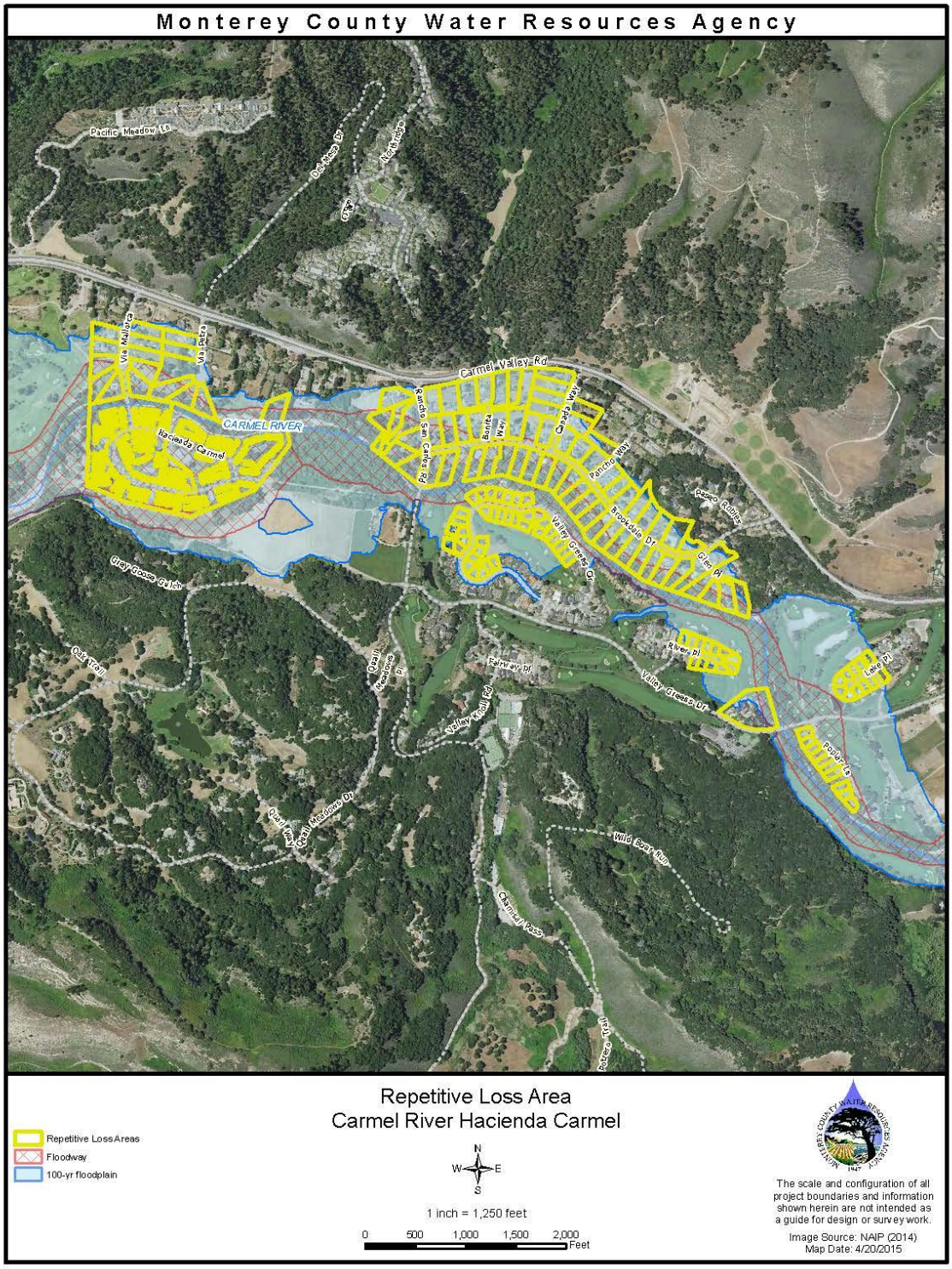
APPENDIX A – REPETITIVE LOSS AREA MAPS

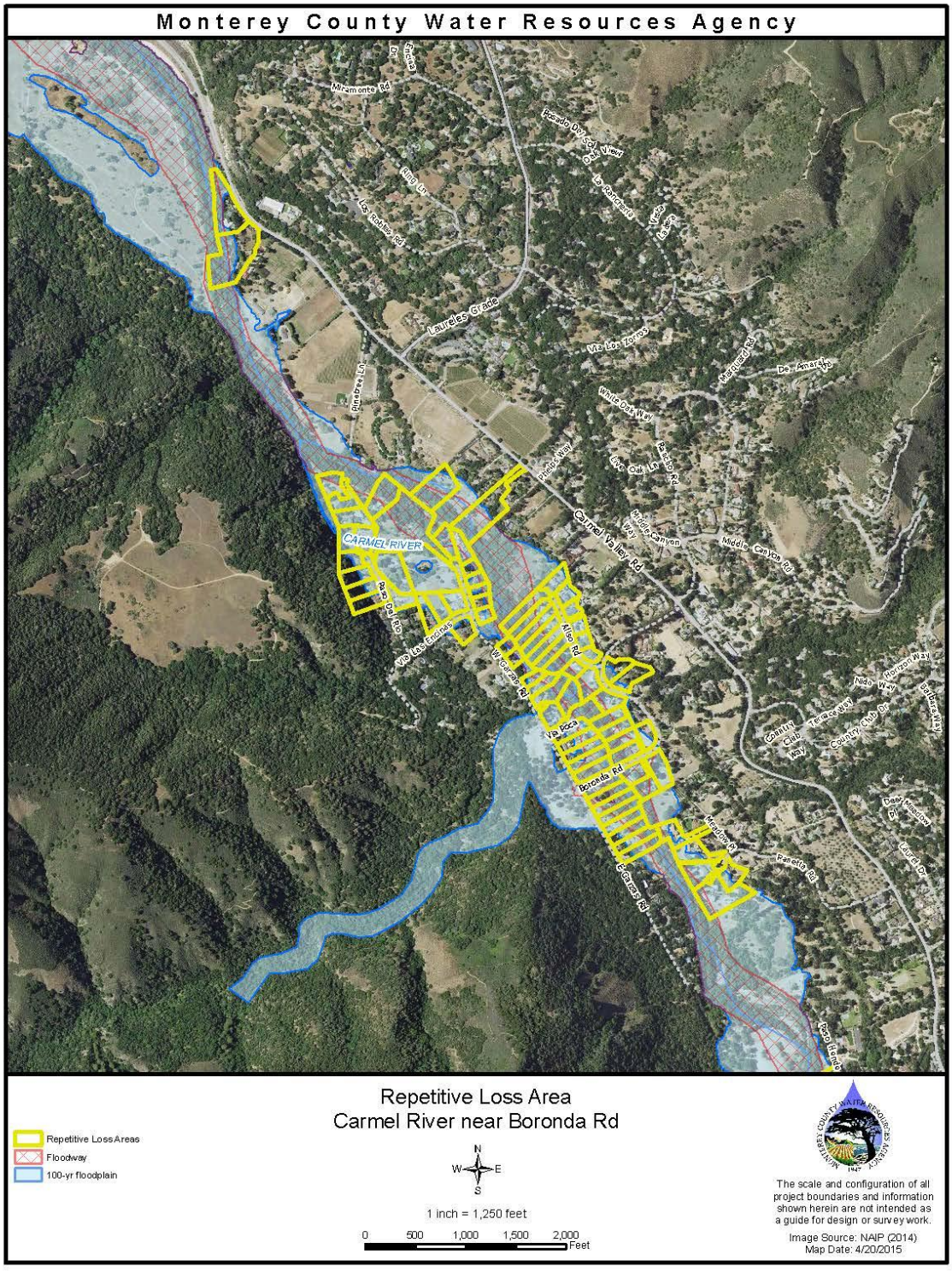

Monterey County Water Resources Agency
BIG SUR RIVER
Hwy 1
Repetitive Loss Area
Big Sur River
Repetitive Loss Areas
Floodway
100-yr floodplain
N
W
E
S
1 inch = 1,250 feet
0
500
1,000
1,500
2,000
Feet
The scale and configuration of all project boundaries and information shown herein are not intended as a guide for design or survey work.
Image Source: NAIP (2014)
Map Date: 4/20/2015


Monterey County Water Resources Agency
Repetitive Loss Area
Calera Creek
Repetitive Loss Areas
Floodway
100-yr floodplain
N
W
E
S
1 inch = 1,250 feet
0
500
1,000
1,500
2,000
Feet
The scale and configuration of all project boundaries and information shown herein are not intended as a guide for design or survey work.
Image Source: NAIP (2014)
Map Date: 4/20/2015
Calera Canyon Rd
Corral De Tierra Rd
Toro Rd
Laureles Grade
Rinconada Dr
Deer Trail Rd
Dean Rd
Roland Canyon Rd
Red Pony Ln
Wolff Ln
Robley Rd
Camino De Chamisal
Corte De Chamisal
Sundance Ln

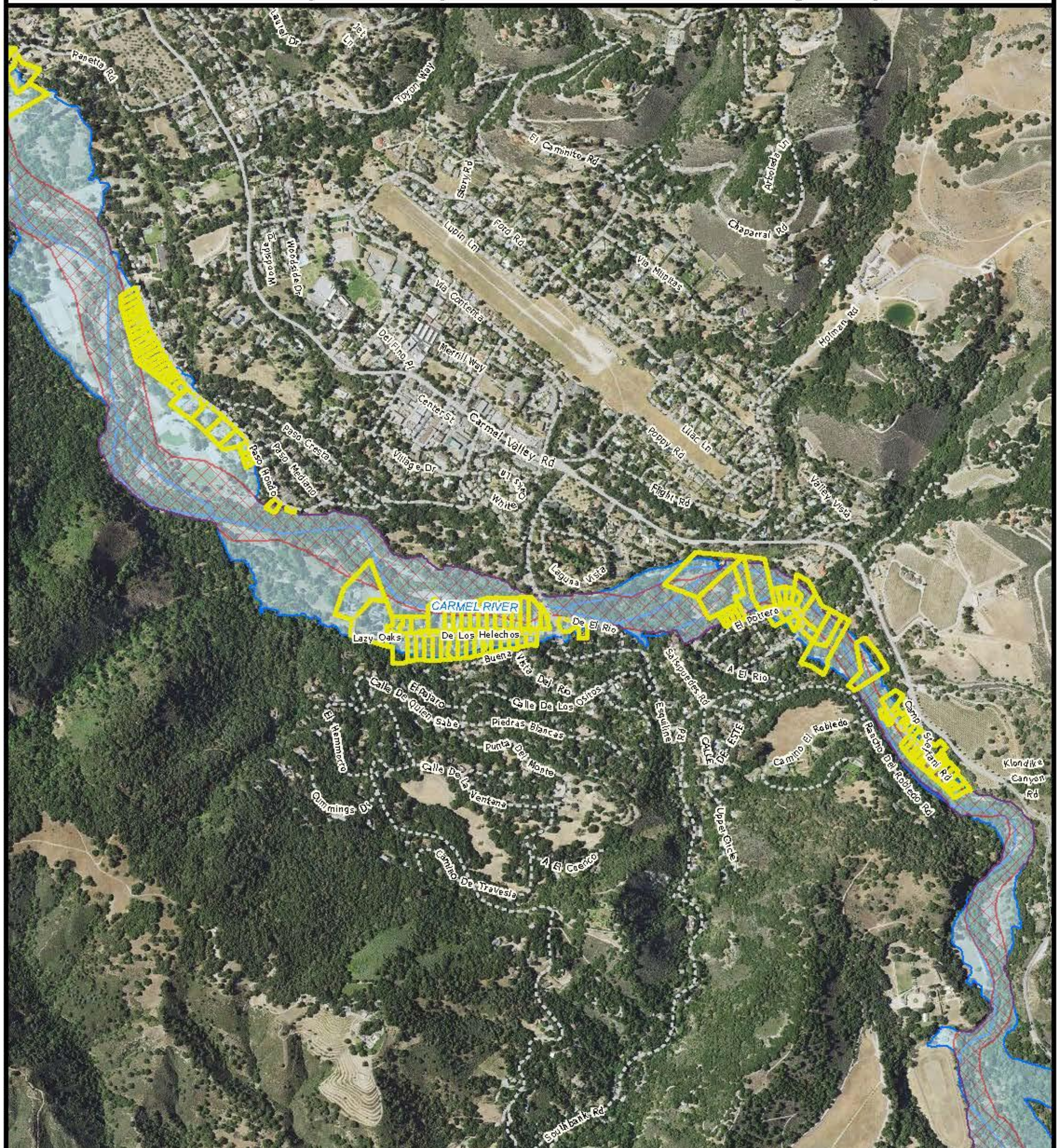

Monterey County Water Resources Agency
Repetitive Loss Area
Carmel Highlands
Repetitive Loss Areas
Floodway
100-yr floodplain
N
W
E
S
1 inch = 1,250 feet
0 500 1,000 1,500 2,000
Feet
The scale and configuration of all project boundaries and information shown herein are not intended as a guide for design or survey work.
Image Source: NAIP (2014)
Map Date: 4/20/2015


Monterey County Water Resources Agency
Carmel Valley Rd
Rio Rd
Riverside Way
Oliver Rd
Median Fields Rd
Carmel Rancho Blvd
Crossroads Blvd
CARMEL RIVER
HWY 1
Repetitive Loss Area
Carmel River Lagoon / CSA-50
Repetitive Loss Areas
Floodway
100-yr floodplain
N
W
E
S
1 inch = 1,250 feet
0 500 1,000 1,500 2,000 Feet
The scale and configuration of all project boundaries and information shown herein are not intended as a guide for design or survey work.
Image Source: NAIP (2014)
Map Date: 4/20/2015


Monterey County Water Resources Agency
Pacific Meadow Ln
Del Mesa Dr
Northridge
Via Mallorca
Via Petra
Carmel Valley Rd
CARMEL RIVER
Hacienda Carmel
Rancho San Carlos Rd
Banita Way
Quail Way
Pancho Way
Brookdale Dr
Paseo Robles
Valley Greens Cir
Glen Pl
Grey Goose Gulch
Quail Meadows Dr
Fairway Pl
River Pl
Valley Greens Dr
Lake Pl
Portola Dr
Valley Knoll Rd
Quail Meadows Dr
Wild Boar Run
Chamisal Pass
Repetitive Loss Areas
Floodway
100-yr floodplain
Repetitive Loss Area
Carmel River Hacienda Carmel
N
W
E
S
1 inch = 1,250 feet
0 500 1,000 1,500 2,000
Feet
The scale and configuration of all project boundaries and information shown herein are not intended as a guide for design or survey work.
Image Source: NAIP (2014)
Map Date: 4/20/2015


Monterey County Water Resources Agency
Miramonte Rd
Los Robles Rd
Laureles Grade
Via Los Tomases
Rancho Rd
Carmel Valley Rd
Middle Canyon Rd
CARMEL RIVER
Rancho Cañada Rd
Via Las Encinas
Via Mallorca Rd
River Rd
Via Boca
Boronda Rd
Meadow Rd
Paseo Grande
Repetitive Loss Area
Carmel River near Boronda Rd
Repetitive Loss Areas
Floodway
100-yr floodplain
N
W
E
S
1 inch = 1,250 feet
0 500 1,000 1,500 2,000 Feet
The scale and configuration of all project boundaries and information shown herein are not intended as a guide for design or survey work.
Image Source: NAIP (2014)
Map Date: 4/20/2015

Monterey County Water Resources Agency



Repetitive Loss Area
Carmel River near Esquiline Rd

- Repetitive Loss Areas
- Floodway
- 100-yr floodplain

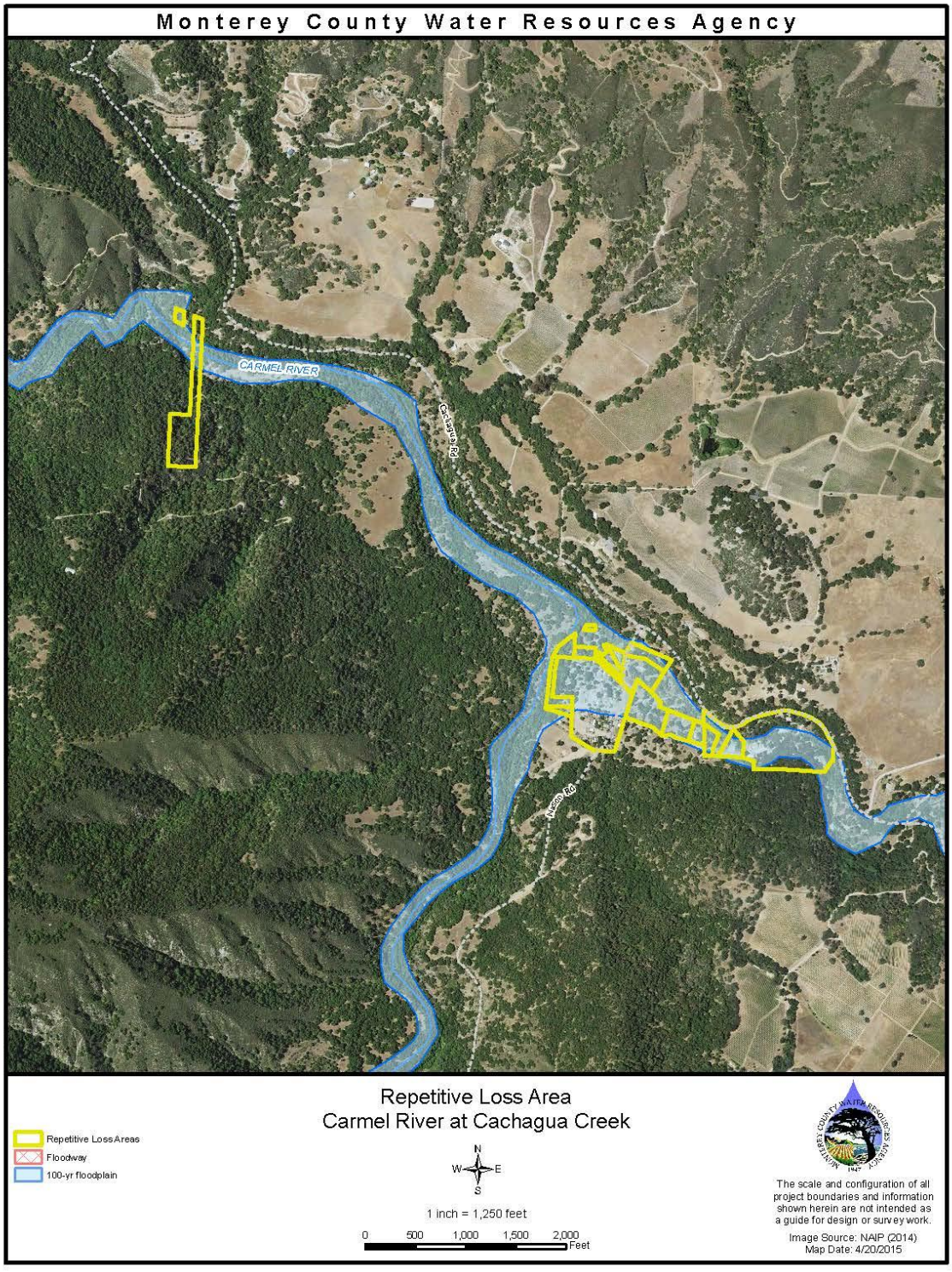
N W E S

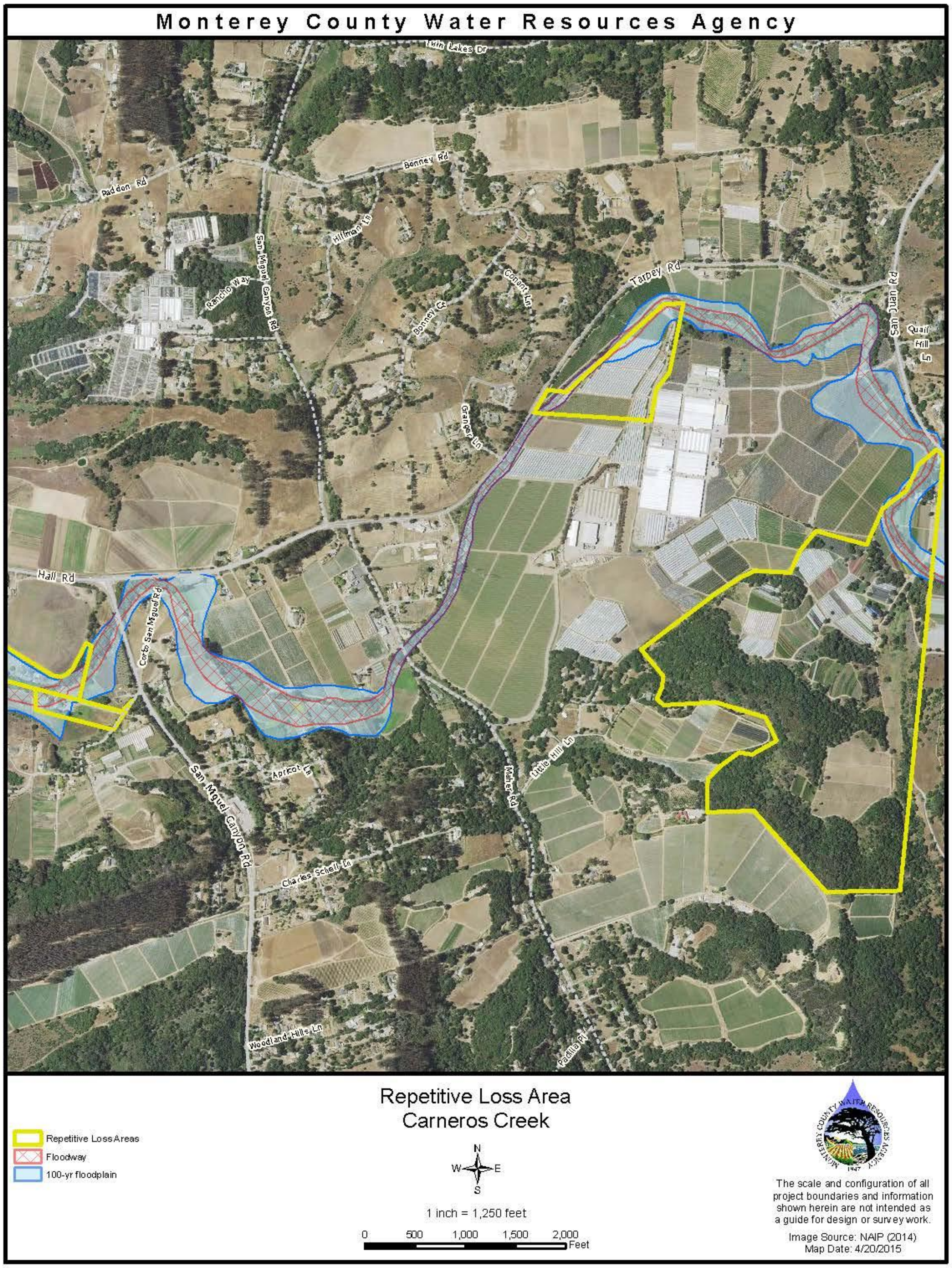
1 inch = 1,250 feet

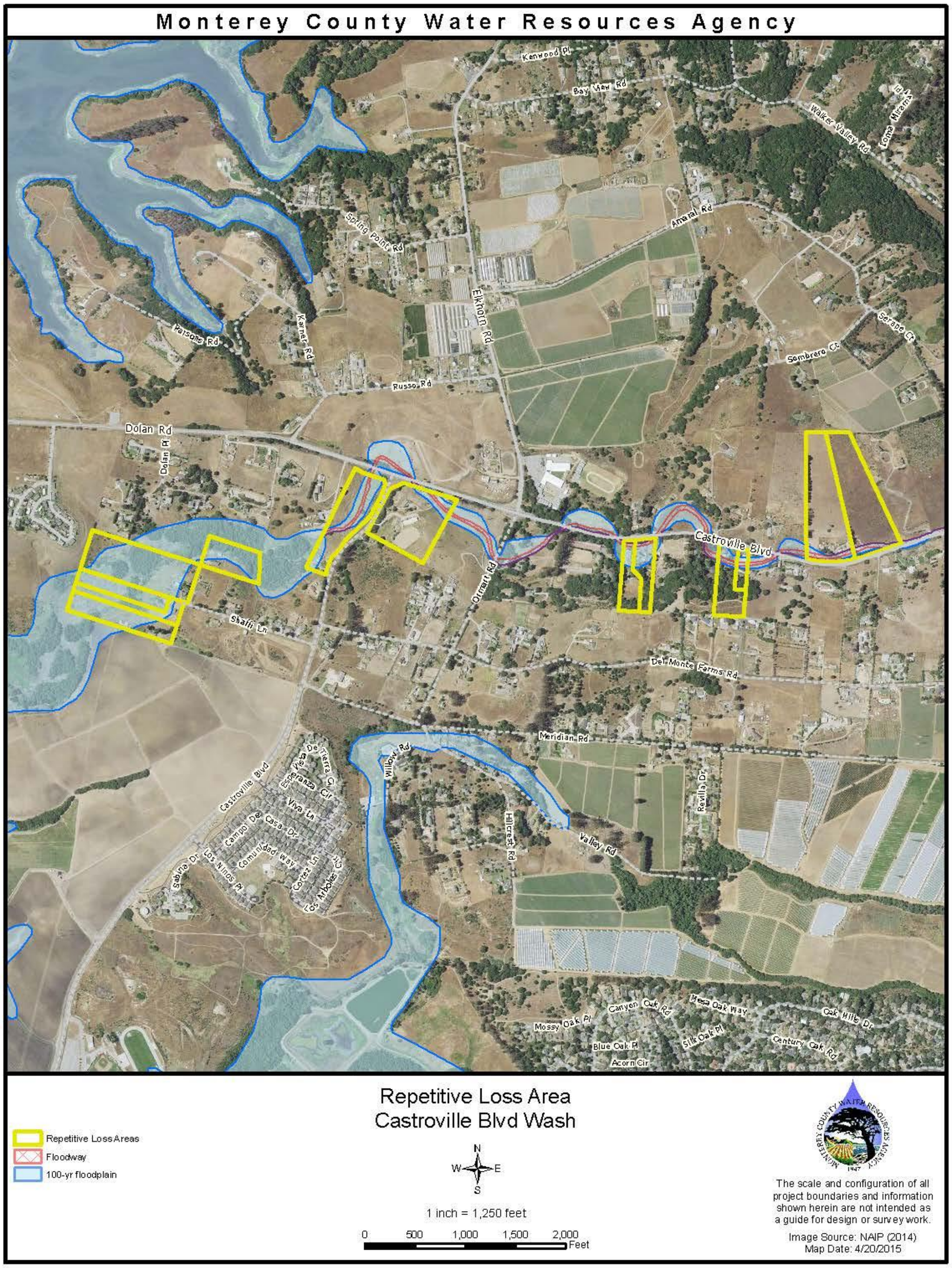
0 500 1,000 1,500 2,000 Feet

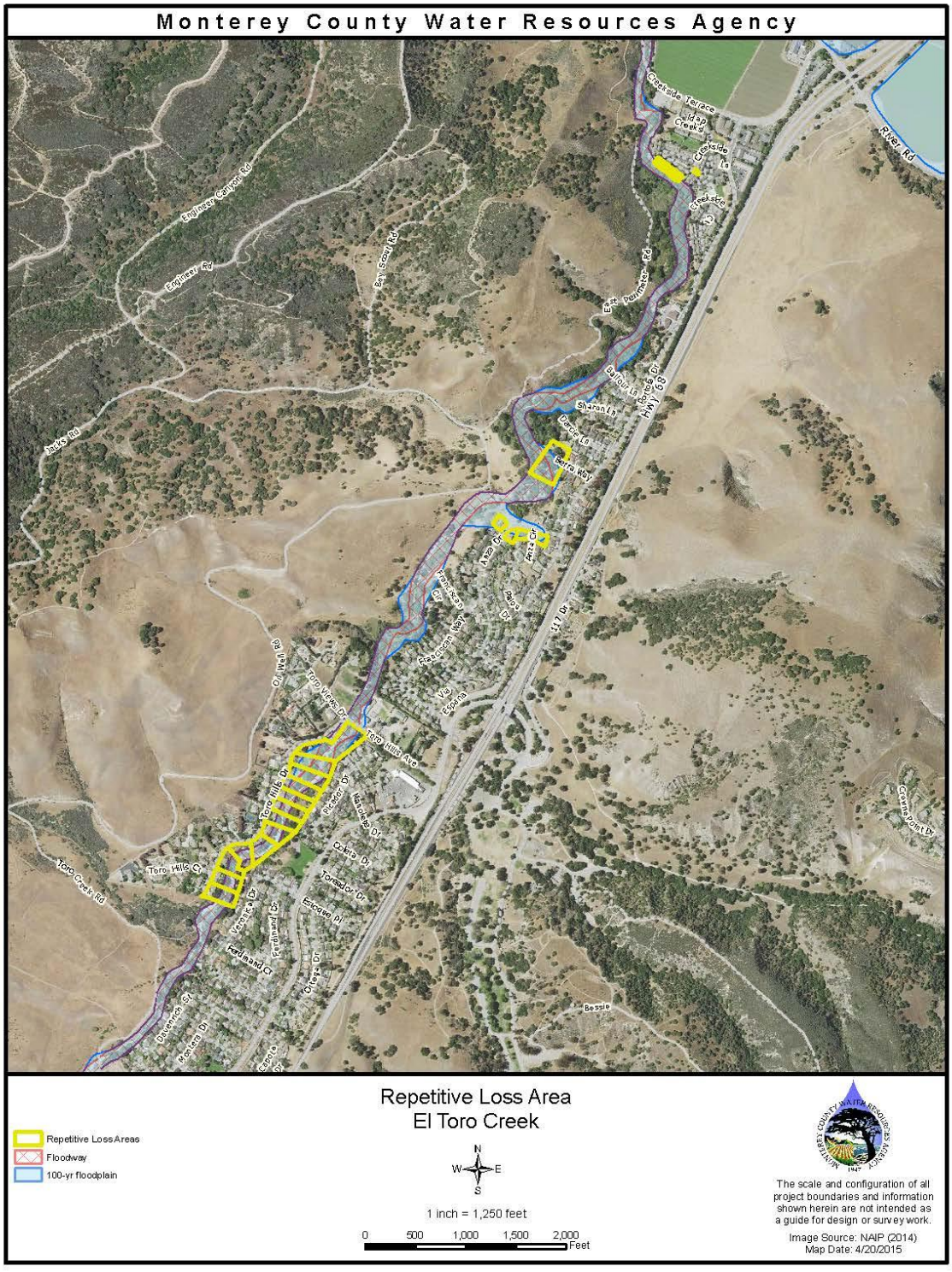
The scale and configuration of all project boundaries and information shown herein are not intended as a guide for design or survey work.

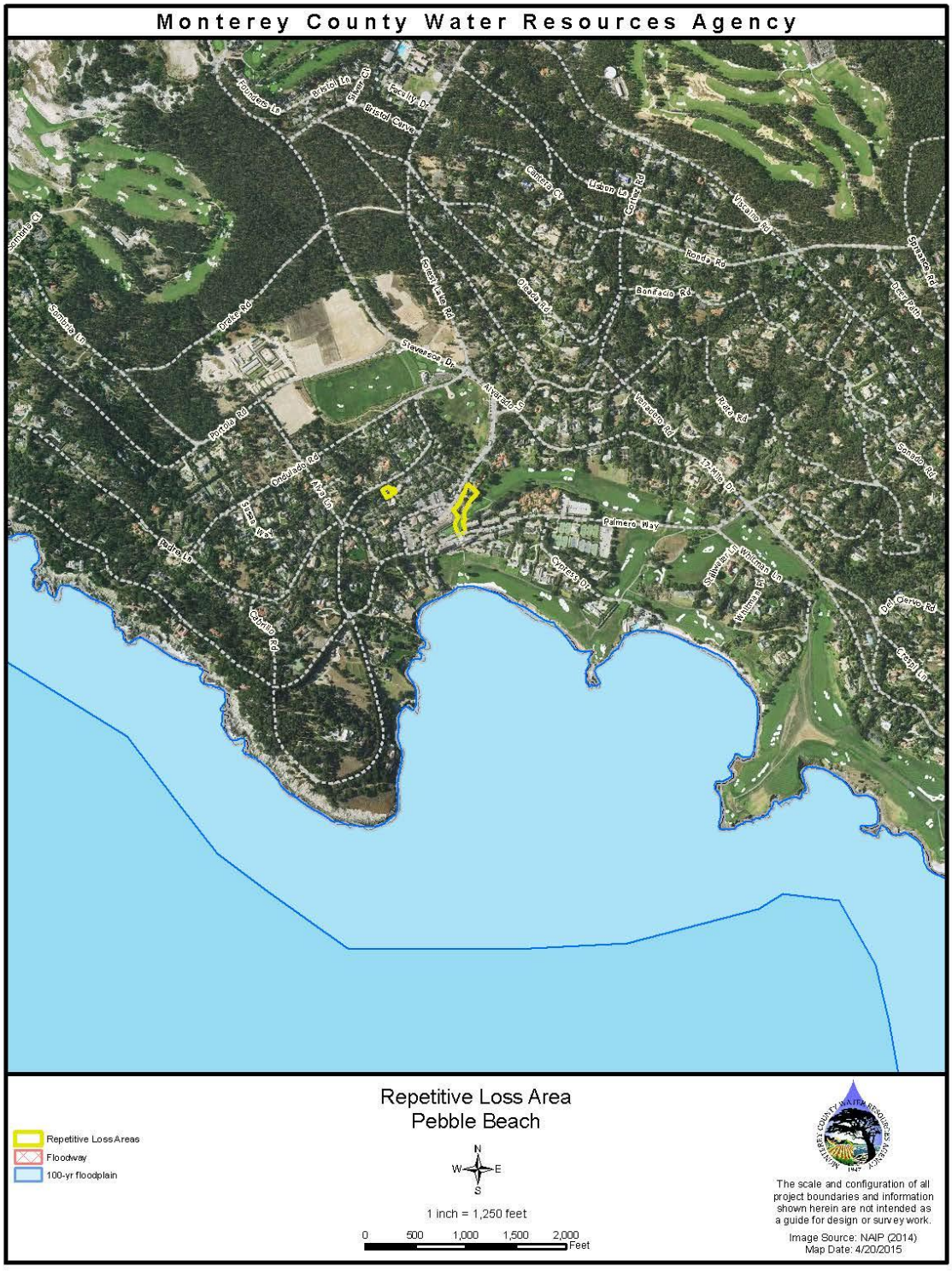
Image Source: NAIP (2014)
Map Date: 4/20/2015

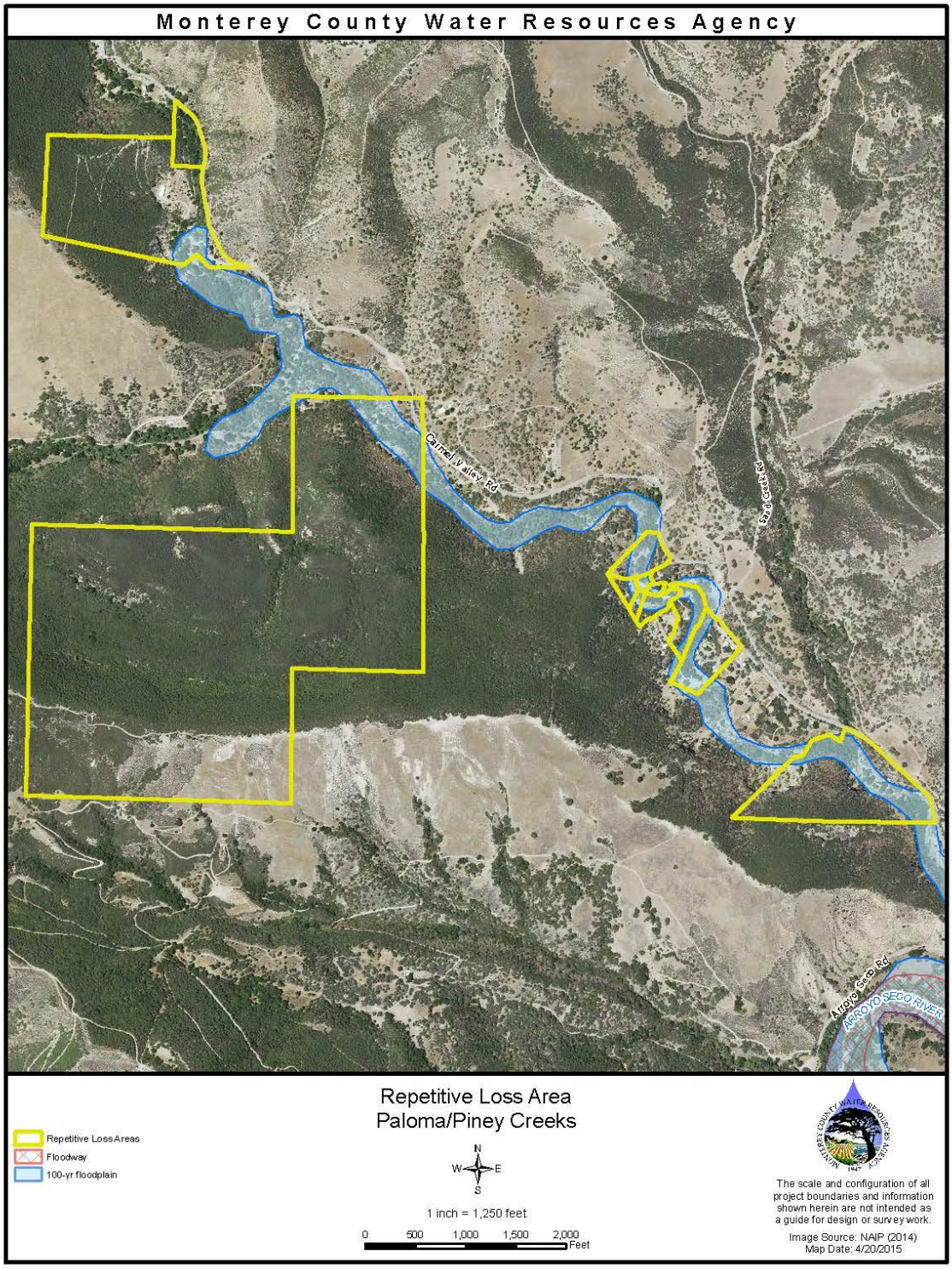

Monterey County Water Resources Agency
CARMEL RIVER
Carmel Rd
Nason Rd
Repetitive Loss Area
Carmel River at Cachagua Creek
Repetitive Loss Areas
Floodway
100-yr floodplain
N
W
E
S
1 inch = 1,250 feet
0
500
1,000
1,500
2,000
Feet
The scale and configuration of all project boundaries and information shown herein are not intended as a guide for design or survey work.
Image Source: NAIP (2014)
Map Date: 4/20/2015

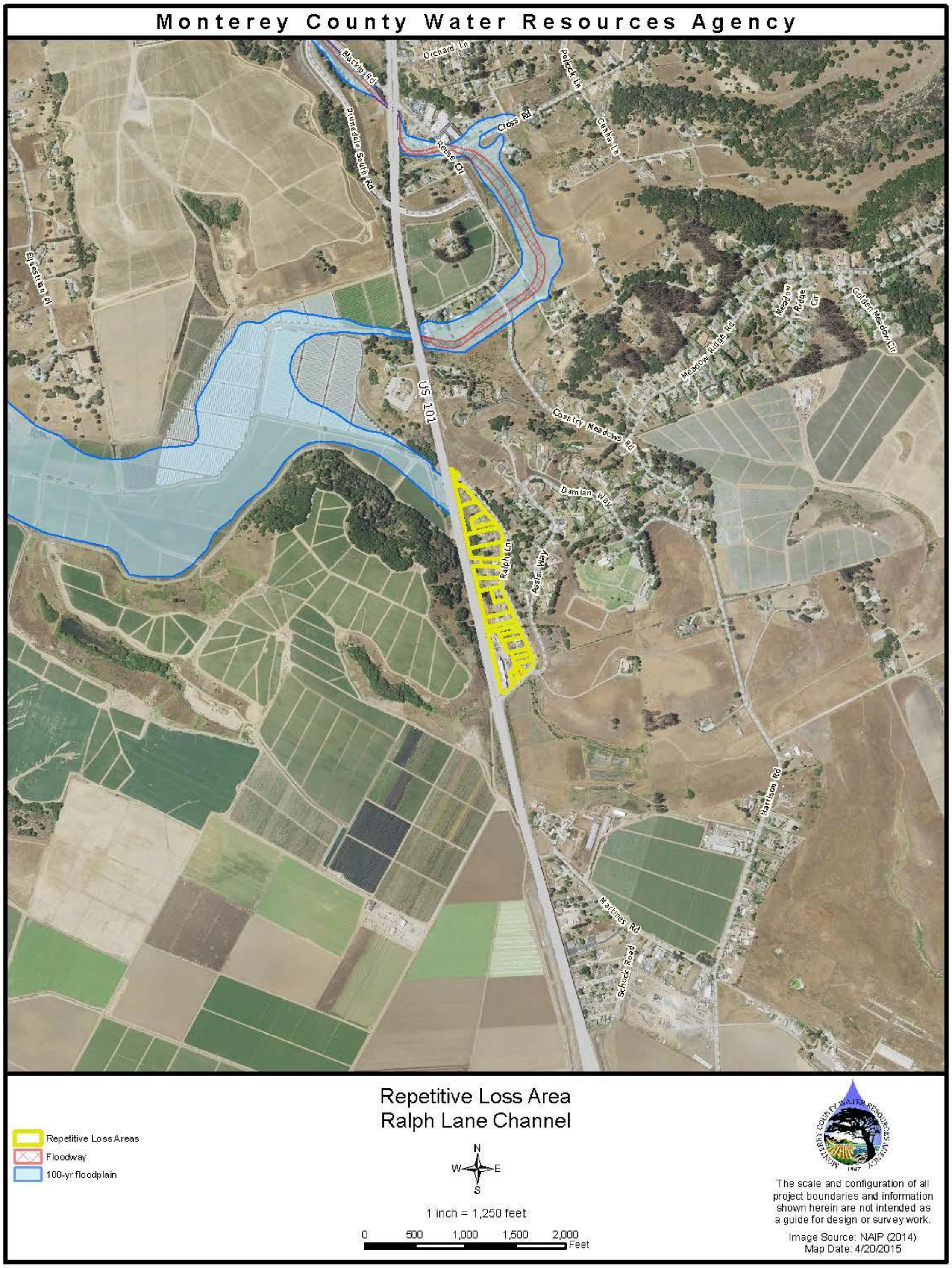

Monterey County Water Resources Agency
Twin Lakes Dr
Bonney Rd
Paddon Rd
San Miguel Canyon Rd
Rancho Way
Tarpey Rd
San Juan Rd
Hall Rd
Corte San Miguel Rd
Apricot Ln
Charles Schell Ln
Woodland Hills Ln
Repetitive Loss Area
Carneros Creek
Repetitive Loss Areas
Floodway
100-yr floodplain
N
W
E
S
1 inch = 1,250 feet
0
500
1,000
1,500
2,000
Feet
The scale and configuration of all project boundaries and information shown herein are not intended as a guide for design or survey work.
Image Source: NAIP (2014)
Map Date: 4/20/2015


Monterey County Water Resources Agency
Kenwood Pl
Bay View Rd
Walker Valley Rd
Spring Point Rd
Amaral Rd
Elkhorn Rd
Paradise Rd
Karner Rd
Serape Ct
Sombrero Ct
Russo Rd
Dolan Rd
Dolan Pl
Castroville Blvd
Shafii Ln
Del Monte Farms Rd
Meridian Rd
Willow Rd
Revilla Dr
Hillcrest Rd
Valley Rd
Viva Ln
Comunidad Way
Cortez Ln
Los Arboles Ct
Canyon Oak Rd
Mesa Oak Way
Oak Hills Dr
Mossy Oak Pl
Silk Oak Pl
Blue Oak Pl
Century Oak Rd
Acorn Cir
Repetitive Loss Area
Castroville Blvd Wash
Repetitive Loss Areas
Floodway
100-yr floodplain
N
W
E
S
1 inch = 1,250 feet
0
500
1,000
1,500
2,000
Feet
The scale and configuration of all project boundaries and information shown herein are not intended as a guide for design or survey work.
Image Source: NAIP (2014)
Map Date: 4/20/2015

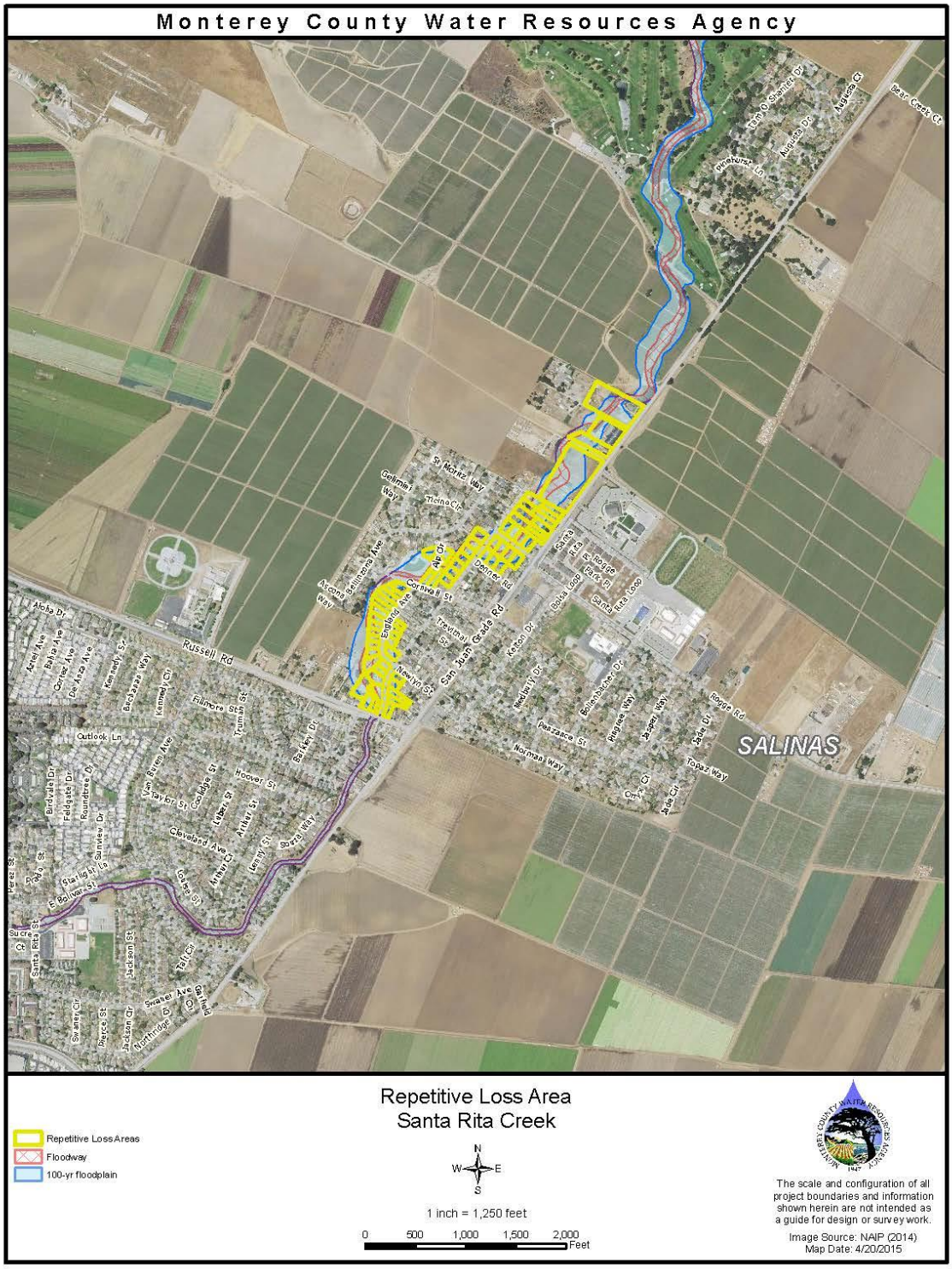

Monterey County Water Resources Agency
Repetitive Loss Area
El Toro Creek
Repetitive Loss Areas
Floodway
100-yr floodplain
N
W
E
S
1 inch = 1,250 feet
0 500 1,000 1,500 2,000
Feet
The scale and configuration of all project boundaries and information shown herein are not intended as a guide for design or survey work.
Image Source: NAIP (2014)
Map Date: 4/20/2015


Monterey County Water Resources Agency
Repetitive Loss Area
Pebble Beach
Repetitive Loss Areas
Floodway
100-yr floodplain
N
W
E
S
1 inch = 1,250 feet
0 500 1,000 1,500 2,000
Feet
The scale and configuration of all project boundaries and information shown herein are not intended as a guide for design or survey work.
Image Source: NAIP (2014)
Map Date: 4/20/2015


Monterey County Water Resources Agency
Carmel Valley Rd
Sandy Creek Rd
Arroyo Seco Rd
ARROYO SECO RIVER
Repetitive Loss Area
Paloma/Piney Creeks
Repetitive Loss Areas
Floodway
100-yr floodplain
N
W
E
S
1 inch = 1,250 feet
0 500 1,000 1,500 2,000
Feet
The scale and configuration of all project boundaries and information shown herein are not intended as a guide for design or survey work.
Image Source: NAIP (2014)
Map Date: 4/20/2015


Monterey County Water Resources Agency
Blackie Rd
Orchard Ln
Pollock Ln
Cross Rd
Reese Cir
Prunedale South Rd
Meadow Ridge Rd
Golden Meadow Cir
US 101
Country Meadows Rd
Damian Way
Ralph Ln
Assisi Way
Harrison Rd
Martines Rd
School Road
Repetitive Loss Area
Ralph Lane Channel
Repetitive Loss Areas
Floodway
100-yr floodplain
N
W
E
S
1 inch = 1,250 feet
0
500
1,000
1,500
2,000
Feet
The scale and configuration of all project boundaries and information shown herein are not intended as a guide for design or survey work.
Image Source: NAIP (2014)
Map Date: 4/20/2015


Monterey County Water Resources Agency
Repetitive Loss Area
San Miguel Canyon Creek
Repetitive Loss Areas
Floodway
100-yr floodplain
1 inch = 1,250 feet
0 500 1,000 1,500 2,000 Feet
The scale and configuration of all project boundaries and information shown herein are not intended as a guide for design or survey work.
Image Source: NAIP (2014)
Map Date: 4/20/2015
US 101
Hwy 156
Prunedale North Rd
Prunedale South Rd
Meridian Rd
Meridian Spur
Vierra Canyon Rd
Blackie Rd
Pesante Rd
Orchard Ln
Martin Ln
Pollock Ln
Eldora Rd
Carlsen Rd
Berta Canyon Rd
Berta Ridge Pl
Frish Rd
Frisch Rd
Countryside Ct
Olson Pl
Borromeo Dr
Arriba Way
Avenida Los Altos
Mountain View Terrace Ln
Cross Rd
Terrace


Monterey County Water Resources Agency
SALINAS
Repetitive Loss Area
Santa Rita Creek
Repetitive Loss Areas
Floodway
100-yr floodplain
N
W
E
S
1 inch = 1,250 feet
0 500 1,000 1,500 2,000 Feet
The scale and configuration of all project boundaries and information shown herein are not intended as a guide for design or survey work.
Image Source: NAIP (2014)
Map Date: 4/20/2015

APPENDIX B – HYDROLOGIC AND HYDRAULIC INFORMATION

Location	Drainage Area (square miles)	10-year	50-year	100-year	500-year
Calera Creek			Peak Discharges (cfs)[a]		
At confluence with San Benancio Creek	25.4	464	1,274	1,768	3,305
At Robley Road	12.8	170	540	850	1,450
At confluence with Watson Creek	12.7	249	689	962	1,824
Carmel River			Peak Discharges (cfs)[b]		
Below San Clemente Dam	125	5,700	10,200	12,100	16,600
Below Tularcitos Creek	184	8,000	14,300	16,900	23,100
Below Hitchcock Creek (USGS Gage Robles Del Rio)	193	8,400	14,900	17,700	24,100
Below Los Garzas Creek	210	8,600	16,100	19,400	27,200
Below Robinson Canyon Creek	228	9,300	17,300	20,900	29,200
Below Potrero Creek (USGS Gage near Carmel)	246	9,500	18,500	22,700	32,600
Pacific Ocean	254	9,800	19,000	23,300	33,500
Carneros Creek			Peak Discharges (cfs) [a]		
At U.S. Highway 101	4.4	120	325	400	760
At Maher Road	22.0	410	1,200	1,530	3,021
At Elkhorn Road	34.0	475	1,370	1,740	3,460
At State Highway 1	48.7	370[c]	960 [c]	1200 [c]	2330 [c]
El Toro Creek			Peak Discharges (cfs) [a]		
At San Benancio Road	23.4	240	860	1,400	2,400
At USGS Gage (Downstream of highway 68)	31.9	400	1,340	1,900	3,500
At confluence with Salinas River	41.4	400	1,390	2,000	3,600
Pajaro River			Peak Discharges (cfs) [a]		
Downstream of Confluence with Salsipuedes Creek	1,275	14,300	32,500	43,600	76,200

[a] Source: Revised Preliminary Flood Insurance Study, Monterey County, California, December 14, 2007

[b] Source: Carmel River Flood Insurance Study Hydrology Report, January 2006

[c] Reduction in Flow Values Due to Overbank Storage in Tidal Flats

[d] Constant or reduced flows due to infiltration into riverbed

Peak Discharge Summary for Select Streams

Salinas River			Peak Discharges (cfs) [a]		
At Bradley	2,536	35,000	67,000	88,000	124,000
At King City	3,220	35,000 [d]	66,000 [d]	86,000 [d]	123,000 [d]
At Spreckels	4,156	35,000 [d]	64,000 [d]	85,000 [d]	121,000 [d]
Downstream of Salinas River overbank	4,156	35,000	64,000	81,000	121,000
San Miguel Canyon Creek			Peak Discharges (cfs) [a]		
Location	Drainage Area (square miles)	10-year	50-year	100-year	500-year
At Echo Valley Pond	1.5	15	50	80	160
At State Highway 156	6.0	65	250	300	750
At Upstream Crossing of Hwy 101	8.2	90	305	440	940
At Downstream Crossing of Hwy 101	12.8	145	490	690	1,460
Santa Rita Creek			Peak Discharges (cfs) [a]		
Location	Drainage Area (square miles)	10-year	50-year	100-year	500-year
At North Main Street (In City of Salinas)	4.2	160	400	465	810

[a] Source: Flood Insurance Study, Monterey County, California, April 2, 2009

[b] Source: Carmel River Flood Insurance Study Hydrology Report, January 2006

[c] Reduction in Flow Values Due to Overbank Storage in Tidal Flats

[d] Constant or reduced flows due to infiltration into riverbed

Peak Discharge Summary for Select Streams (CONTINUED)

Peak Flow Arrival Times at Pajaro near Chittenden

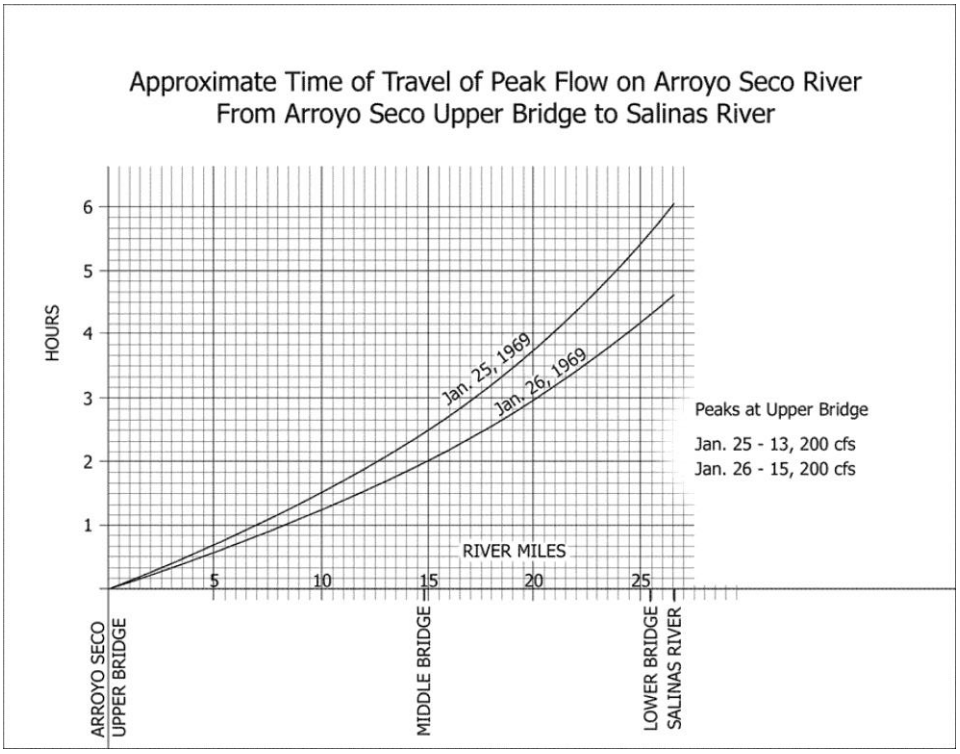
MONTEREY COUNTY WATER RESOURCES AGENCY

PEAK FLOW ARRIVAL AT PAJARO R. nr CHITTTENDEN
U.S.G.S. Station No. 11159000

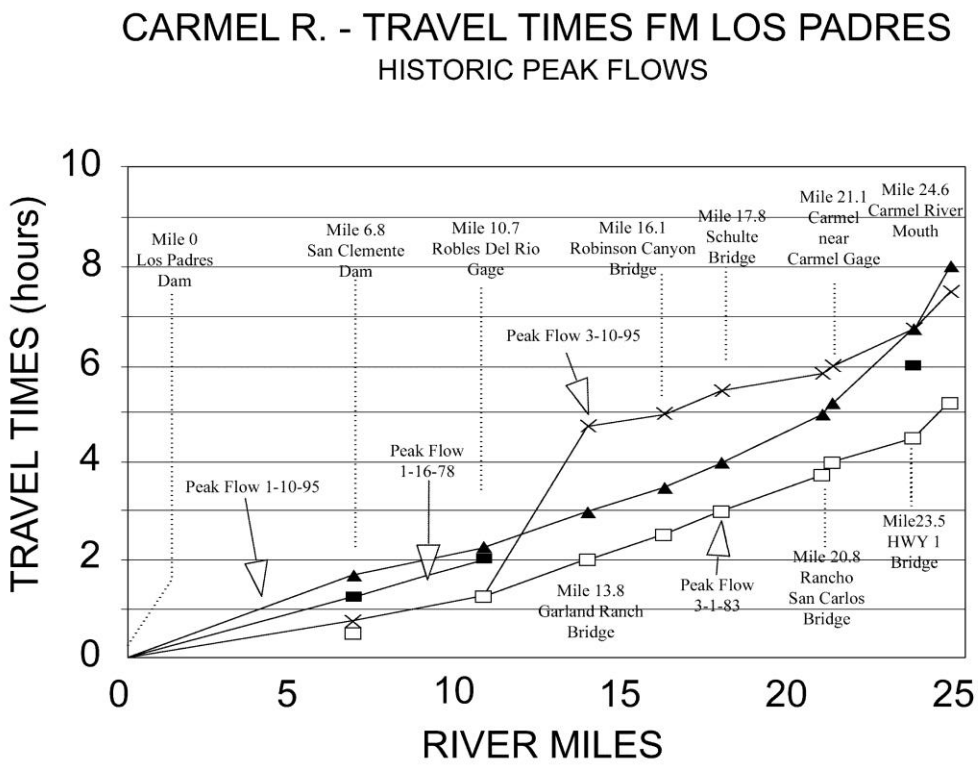
Peaks Recorded at Pajaro R. nr Chittenden Station:
3/10/95 2200 hrs G.H. 32.13 Q 21,300
3/11/95 1300 hrs G.H. 32.20 Q 21,500

					ARRIVAL DATE/TIME		
CFS	DATE/TIME (local)	FROM	APPROX. MILES FROM CHITT.	TRAVEL TIME (hours)	ESTIMATE	ACTUAL	REMARKS
16,700*	03/10 1600	San Benito R. @ Hwy 156	12	6	03/10 2200	2200	
12,500	03/10 1415	Pacheco Cr. Nr Dunneville	24	9-10	03/10 2345	2200	Peak coincides with San Benito R. peak @ Chittenden
4,160	03/10 1700	Uvas Reservoir Spillway	22	6-7	03/10 2330	0300	Peak from S.C.V.W.D Records
934	03/11 0345	Llagas Cr. Below Chesbro Reservoir	27	7-8	03/11 1135	1200	Peak from S.C.V.W.D Records
11,200*	03/11 0900	San Benito R. @ Hwy 156	12	6	03/11 1500	1300	Peak coincides with Llagas Cr. Peak @ Chittenden
7,420*	03/12 0115	San Benito R. @ Hwy 156	12	6	03/12 0700	0600	

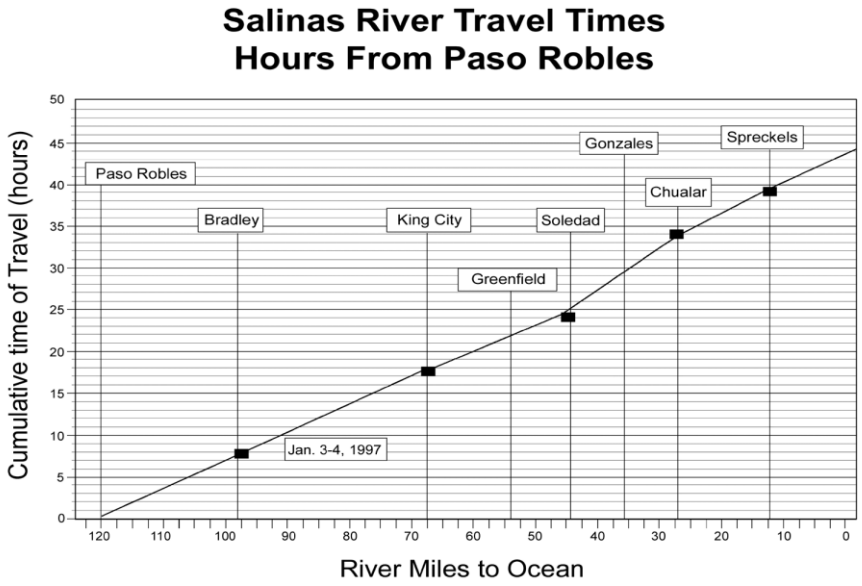
Arroyo Seco River Travel Times



Carmel River Travel Times



Salinas River Travel Times

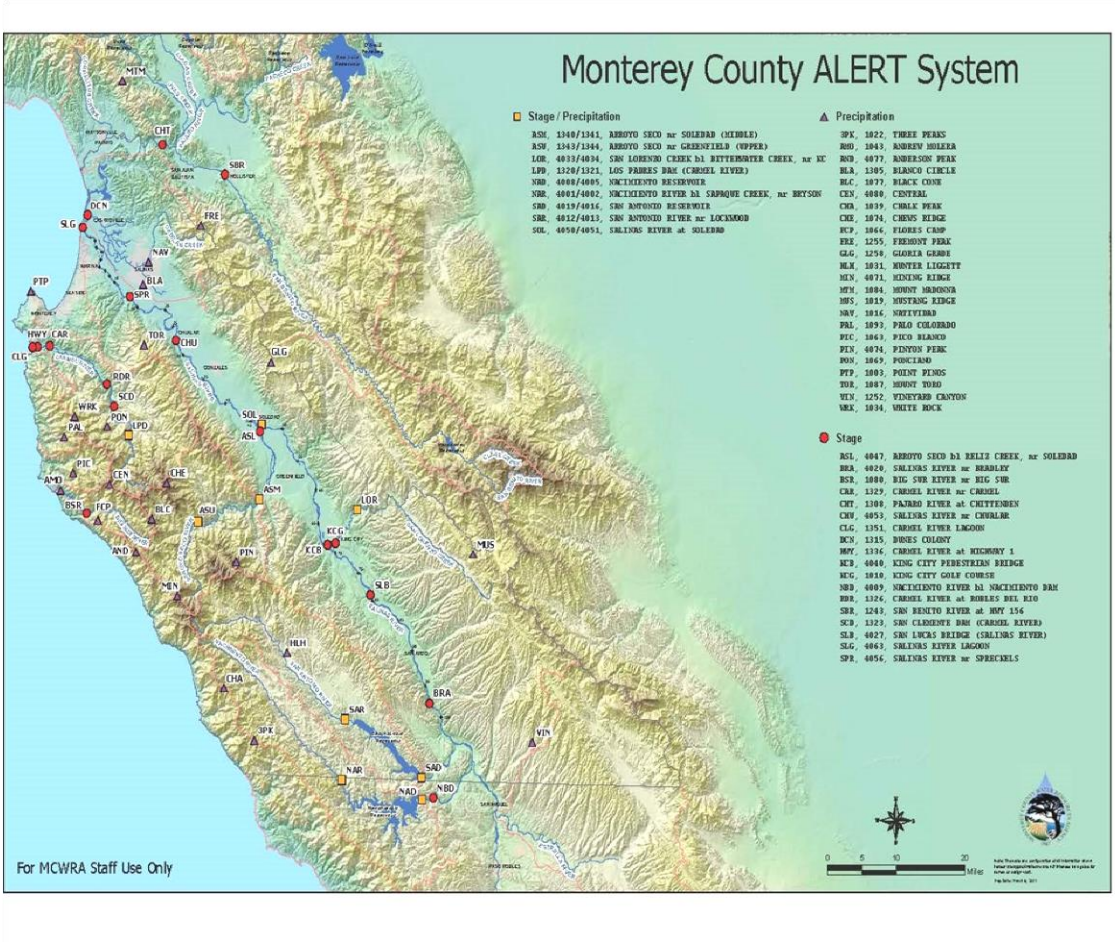


Salinas River Travel Times for Small Consecutive Flows with Wet Channel*

	Gage	Date/Time	Q		Time of Travel (hours)
Peak # 1					
	ASM	01/10 2115	1760		
				}	7.5
	ASL	01/11 0445	620		
				}	16.5
	CHU	01/11 2115	400		
				}	13
	SPR	01/12 1030	425		
				Total 37 hours	
Peak # 2					
	ASM	01/11 2130	1710		
				}	5
	ASL	01/12 0230	977		
				}	15.5
	CHU	01/12 1800	860		
				}	10.5
	SPR	01/13 430	780		
				Total 31 hours	

* Arroyo Seco channel dry from ASM to ASL. Salinas channel wet through reservoir releases to SPR.

Alert Gage Location Map



APPENDIX C – CRS COORDINATOR'S MANUAL INFORMATION

FMP Credit Calculation for Total Maximum Points

Planning Steps for mitigation and for the CRS		
Multi-Hazard Mitigation Planning	CRS	Maximum
Phase I – Planning Process	1. Organize	15
	2. Involve the public	120
	3. Coordinate	35
Phase II – Risk Assessment	4. Assess the hazard	35
	5. Assess the problem	52
Phase III – Mitigation Strategy	6. Set goals	2
	7. Review possible activities	35
	8. Draft an action plan	60
Phase IV – Plan Maintenance	9. Adopt the plan	2
	10. Implement, evaluate, and revise	26
TOTAL		382

Step 1: Organize to prepare the plan: (Maximum Credit: 15 points)
The credit for this step is based on how the community organizes to prepare its floodplain management plan.

Points	Description
4	4 points, if the office responsible for the community's land use and comprehensive planning is actively involved in the floodplain management planning process. The "office" may be the community's planning or community development department, a consulting firm, or a regional planning agency, provided that it performs regular land use or comprehensive planning duties for the community. This office is usually not the floodplain management or mitigation planner or consultant, because the intention of this credit is to incorporate the floodplain management or mitigation plan into the rest of the community's planning activities. "Actively involved" means that staff regularly attend meetings, assist in the coordination (Step 3), and either write or review draft sections of the plan.
9	9 points, if the planning process is conducted through a committee composed of staff from those community departments that implement or have expertise in the activities that will be reviewed in Step 7. One point is provided for each office represented. Divisions of departments can be counted as separate offices. For smaller communities with fewer departments, full credit is provided if the committee has representation from

	all offices with expertise in all six categories of activities credited in Step 7.
2	2 points, if the planning process and/or the committee are formally created or recognized by action of the community's governing body.

Step 2: Involve the Public: (Maximum Credit: 120 points)
The credit for this step is the total of the following points based on how the community involves the public during the planning process.

Points	Description
60	Up to 60 points, if the planning process is conducted through a planning committee that includes members of the public and meets the specific criteria.
15	15 points, if one or more public information meetings is held in the affected area(s) within the first two months of the planning process to obtain public input on the natural hazards, problems, and possible solutions. The meetings must be held separately from the planning committee meetings credited in item (1).
15	15 points, for holding one or more public meetings to obtain input on the recommended plan. The meeting(s) must be at the end of the planning process, at least two weeks before submittal of the recommended plan to the community's governing body.
30	5 points, for each additional public information activity implemented to explain the planning process and encourage input to the planner or planning committee, up to a maximum of 30 points.

Step 3: Coordinate (Maximum Credit: 35 points)
The credit for this step is the total of the following points. To receive credit for this step, the coordination must include item (a).

Points	Description
5	5 points, if the planning includes a review of existing studies, reports, and technical information and of the community's needs, goals, and plans for the area. (REQUIRED) Where the information from the existing studies and reports is used in the plan, the source(s) should be referenced.
30	30 points, for coordinating with agencies and organizations outside the community's governmental structure. There is no credit for talking to other departments within the city or county government.

Step 4: Assess the Hazard (Maximum Credit: 35 points)
The credit for this step is the total of the following points based on what the community includes in its assessment of the hazard.

Points	Description
15	15 points, for including an assessment of the flood hazard in the plan. (REQUIRED) Flood hazard areas that require assessment include • The Special Flood Hazard Area (SFHA) shown on the Flood Insurance Rate Map (FIRM), • Repetitive loss areas, • Areas not mapped on the FIRM that have flooded in the past, and

	• Other surface flooding identified in other studies. (1) 5 points, for a map of the flood hazard areas. Area maps are acceptable for multijurisdictional plans. (2) 5 points, for a description of the known flood hazards, including source of water, depth of flooding, velocities, and warning time. (3) 5 points, for a discussion of past floods.
10	10 points, for including an assessment of less-frequent flood hazards in the plan.
5	5 points, if the assessment identifies areas likely to be flooded and flood problems that are likely to get worse in the future as a result of (1) changes in floodplain development and demographics, (2) development in the watershed, and (3) climate change or sea level rise. The credit is prorated if the assessment does not include all three types of changes.
5	5 points, if the plan includes a description of the magnitude or severity, history, and probability of future events for other natural hazards, such as earthquakes, wildfires, or tornados. The plan should include all natural hazards that affect the community. At a minimum, it should include hazards identified by the state's hazard mitigation plan.

Step 5: Assess the Problem (Maximum Credit: 52 points)

The credit for this step is the total of the following points, based on what is included in the assessment of the vulnerability of the community to the hazards identified in the previous, hazard assessment, step.

Points	Description
2	2 points, if the plan includes an overall summary of the jurisdiction's vulnerability to each hazard identified in the hazard assessment (Step 4) and the impact on the community.
25	25 points, if the plan includes a description of the impact that the hazards identified in the hazard assessment (Step 4)
5	5 points, if the assessment includes a review of historical damage to buildings, including all properties that have received flood insurance claims payments (in addition to the repetitive loss properties) and/or an estimate of the potential damage and dollar losses to vulnerable structures, including damage from mold and other flood-related hazards.
5	5 points, if the assessment describes areas within the floodplain that provide natural functions, such as wetlands, riparian areas, sensitive areas, and habitat for rare or endangered species.
7	7 points, if the assessment includes a description of development, redevelopment, and population trends and a discussion of what the future brings for development and redevelopment in the community, the watershed, and natural resource areas.
8	8 points, if the assessment includes a description of the impact of the future flooding conditions described in Step 4(c) on people, property, and natural floodplain functions.

Step 6: Set Goals (Maximum Credit: 2 points)

The points for this step are provided if the plan includes a statement of the goals of the community's floodplain management or hazard mitigation program. The goals must address all flood-related problems identified in Step 5.

Points	Description
2	2 points, if goals should set the context for the subsequent review of floodplain management activities and drafting of the action plan (Figure 510-3). They should incorporate or be consistent with other community goals for the affected areas. A multi-hazard mitigation plan should have

	goals that address all the major hazards that face the community.

Step 7: Review Possible Activities (Maximum Credit: 35 points)

The credit for this step is the total of the following points based on which floodplain management or hazard mitigation activities are reviewed in the plan.

Points	Description
5	5 points, if the plan reviews preventive activities, such as zoning, stormwater management regulations, building codes, subdivision ordinances, and preservation of open space, and the effectiveness of current regulatory and preventive standards and programs.
5	5 points, if the plan reviews whether the community's floodplain management regulatory standards are sufficient for current and future conditions, as discussed under Steps 4(c) and 5(f).
5	5 points, if the plan reviews property protection activities, such as acquisition, retrofitting, and flood insurance;
5	5 points, if the plan reviews activities to protect the natural and beneficial functions of the floodplain, such as wetlands protection;
5	5 points, if the plan reviews emergency services activities, such as warning and sandbagging;
5	5 points, if the plan reviews structural projects, such as levees, reservoirs, and channel modifications; and
5	5 points, if the plan reviews public information activities, such as outreach projects and environmental education programs.

Step 8: Draft an Action Plan (Maximum Credit: 60 points)

The credit points are based on the range of actions that are recommended in the plan. For each recommendation, the action plan must identify who does what, when it will be done, and how it will be financed.

Points	Description
45	45 points, depending on how many categories are covered by the action items: (1) 10 points, if the action plan includes flood-related recommendations for activities from two of the six categories credited in Step 7; OR (2) 20 points, if the action plan includes flood-related recommendations for activities from three of the six categories credited in Step 7; OR (3) 30 points, if the action plan includes flood-related recommendations for activities from four of the six categories credited in Step 7; OR (4) 45 points, if the action plan includes flood-related recommendations for activities from five of the six categories credited in Step 7.
10	10 additional points are provided if the action plan establishes or revises post-disaster redevelopment and mitigation policies and procedures. These policies and procedures should account for the expected damage from a base flood or other disaster. For example, the action plan should identify the areas likely to be worst hit and the policies should determine whether they will be rebuilt if substantially damaged. Post-disaster mitigation procedures should assign responsibilities for public information, code enforcement, planning, and other efforts that encourage, mandate, and/or fund loss reduction activities.
5	5 additional points are provided if the plan includes action items (other than public information activities) to mitigate the effects of the other natural hazards identified in the hazard assessment.

Step 9: Adopt the Plan (Maximum Credit: 2 points)

The points for this step are provided if the plan and later amendments are officially adopted by the community's governing body.

Points	Description
2	2 points, The plan must be an official plan of the community, not an internal staff proposal. "Adopted" means that there is a resolution or other formal document that is voted on by the community's governing body. A note in the minutes or passage via a consent agenda is not credited.

Step 10: Implement, Evaluate, and Revise (Maximum Credit: 26 points)

To be useful, planning must be ongoing and plans must be dynamic. The plan should not sit on a shelf gathering dust once it is completed. Therefore, the community must have an evaluation and update process.

Points	Description
2	2 points, if the community has procedures for monitoring implementation, reviewing progress, and recommending revisions to the plan in an annual evaluation report. The report must be submitted to the governing body, released to the media, and made available to the public.
24	24 points, if the annual evaluation report is prepared by the same planning committee that prepared the plan that is credited in Step 2(a) or by a successor committee with a similar membership that was created to replace the planning committee and charged with monitoring and evaluating implementation of the plan. The points are based on how frequently the committee meets, since more frequent meetings yield more progress toward implementing the plan. The committee must continue to meet the representation, quorum, and other criteria that determined the credit points under Step 2(a). (1) 6 points, if the committee meets only once a year. (2) 12 points, if the committee meets twice a year. (3) 24 points, if the committee meets at least quarterly.

FMP SIX-STEP UPDATE PROCESS

Five-year Update

The community must submit a copy of its plan update at least every five years. The plan update will be reviewed for CRS credit according to the *Coordinator's Manual* currently in effect, not the version used when the community originally requested this credit. The update must include the following steps:

(a) Steps 1 and 2: If the original planning process included a committee, then in order to keep the credit provided under Step 1(b) or Step 2(a), the update must be conducted by a committee that meets the criteria identified in those steps.
(b) Step 2: If the original planning process received credit for a public meeting credited under Step 2, item (c), then to keep this credit the community must also conduct a public meeting that reviews and receives comments on the draft update.
(c) Step 3, item (a): The update must include a review of new studies, reports, and technical information and of the community's needs, goals, and plans for the area that have been published since the plan was prepared.
(d) Steps 4 and 5: The hazard and problem assessments must be reviewed and brought up to date. The assessments must account for

- New floodplain or hazard mapping,
- Annexation of flood-prone areas,
- Additional repetitive loss properties,
- Completed mitigation projects,
- Increased development in the floodplain or watershed,
- New flood control projects,
- Lack of maintenance of flood control projects,
- Major floods or other disasters that occurred since the plan was adopted, and
- Any other change in flooding conditions and/or development exposed to flooding or the other hazards covered in the plan.

(e) Step 6: The original plan's goals must be reviewed to determine if they are still appropriate, given the revisions to Steps 4 and 5.
(f) Step 8: The action plan must be revised to account for projects that have been completed, dropped, or changed and for changes in the hazard and problem assessments, as appropriate.
(g) Step 9: The update must be adopted by the community's governing body. An annual evaluation report that includes these steps may qualify as the five-year update (but may not qualify as an update for a multi-hazard mitigation plan).

APPENDIX D – FLOODPLAIN DEVELOPMENT ACTIVITY REPORT

Discretionary Permits 2008-2013

Group Of AREA	DATE ENTERED	PROJECT DESCRIPTION
BIG SUR	08/16/2010	REPLACE 1714 SQ FT SFD WITH 1869 SQ FT SFD.
	07/30/2009	GRADING FOR REPLACEMENT OF EXISTING BARN.
	11/03/2010	PARTIAL RE-ROOF, MODIFICATIONS TO GENERAL STORE.
CARMEL	10/16/2008	NON-ELECTRIC FENCE AND GATE.
	12/25/2008	INTERIOR REMODEL.
	07/29/2009	GRADING FOR SLOPE/BANK PROTECTION.
	04/19/2013	INTERIOR REMODEL.
	05/14/2010	135 SQ FT ADDITION TO EXISTING SFD.
	12/03/2009	EXTENSIVE REMODEL TO 2520 SQ FT SFD.
	04/28/2010	240 SQ FT STORAGE SHED ADDITION TO EXISTING WORKSHOP/GARAGE.
	04/29/2010	REMODEL EXISTING STORAGE AREA INTO SALES AREA.
	09/20/2012	REMODEL, ADDITION TO SFD.
	02/20/2008	CONSTRUCT 2,232 SQ.FT. MFD, 440 SQ.FT. GARAGE
	03/02/2012	REMODEL SFD, RIVERBANK RESTORATION.
	05/03/2012	CONSTRUCT NEW GARAGE, CONVERT EXISTING GARAGE, REMODEL/ADDITION TO SFD.
	04/02/2013	EXPAND (149 SQ FT), REMODEL MASTER BATH.
	11/01/2012	12CP01663: INTERIOR REMODEL OF SFD; 12CP01761: ROOFING PERMIT. 12CP01571 (WINDOW / DOOR REPLACEMENT) ALSO PART OF PROJECT, BUT NOT ROUTED TO WRA FOR REVIEW.
	12/22/2010	INTERIOR REMODEL.
	04/27/2012	204 SQ FT ADDITION TO 2314 SQ FT SFD.
	07/12/2012	RENOVATION OF SFD.
	06/14/2012	REPLACE FIRE-DAMAGED HOME.
	07/31/2012	REMODEL MASTER BATH AND CLOSET / REMODEL MASTER BEDROOM.
	12/21/2012	TENANT IMPROVEMENT.
	09/05/2013	INTERIOR REMODEL, ADDITION OF COVERED PATIO AND ARBOR.
	06/18/2013	MINOR ADDITION, REMODEL TO SFD.
	02/07/2008	INTERIOR REMODEL OF MAIN LOBBY.
	01/28/2008	INTERIOR REMODEL OF PUBLIC RESTROOM AND STAFF RESTROOM FOR ACCESSIBILTY

	01/10/2008	IN-GROUND THERAPY SPA
	05/27/2009	TENANT IMPROVEMENTS; TO CLEAR CE 040265.
	05/08/2009	REMODEL 1545 SQ FT OF EXISTING RESIDENCE.
	05/08/2009	1090 SQ FT ADDITION TO 2089 SQ FT SFD.
	01/24/2008	151 SQ.FT. ADDITION TO 2 ROOMS ON THIRD FLOOR OF BUILDING "A"
	04/24/2008	REMODEL, ADDITION TO SFD.
	01/10/2008	12X10, 19X6 STORAGE SHEDS.
	06/19/2008	TENANT IMPROVEMENT.
	03/03/2008	71 SQ FT REMODEL, 184 SQ FT ADDITION TO 3576 SQ FT SFD.
	06/19/2013	ENCLOSE EXISTING CARPORT.
CARMEL VALLEY	11/15/2013	37 LINEAR FEET OF GABION BASKETS WERE INSTALLED BY PROPERTY OWNER TO CONTROL EROSION ALONG BANK OF CARMEL RIVER.
	08/30/2013	INTERIOR REMODEL OF SFD, NEW COVERED PATIO, NEW WOOD ARBOR.
	07/29/2010	REMODEL, ADDITION TO SFD.
	04/24/2012	1412 SQ FT DISASTER REBUILD (SHOP, CARPORT).
	11/19/2013	1,000 SQ.FT. FOUR STALL HORSE BARN AND LANDSCAPE BLOCK WALL
	12/22/2011	VARIOUS ADDITIONS, NEW SHED; 10CE00448.
	10/06/2010	2104 SQ FT SFD.
	02/16/2012	FINAL PROJECT DESCRIPTION (01/25/2013): 147.5 SQ FT REMODEL, 61 SQ FT ADDITION TO SFD.
	07/23/2009	INTERIOR REMODEL OF SFD.
	11/11/2010	REPLACE GARAGE ROOF.
	06/08/2009	613 SQ FT GREAT ROOM AND WALK-IN CLOSET ADDITION TO EXISTING SFD; REMODEL EXISTING MASTER BATH.
	12/09/2010	INSTALLATION OF WATER TANK.
	01/04/2011	FIBERGLASS SWIMMING POOL AND SPA.
	04/11/2013	600 SQ FT ADDITION TO 1,279 SQ FT SFD, 93.5 SQ FT COVERED DECK.
	04/08/2009	DEMO 390 SQ FT GUEST COTTAGE, REPLACE WITH 498 SQ FT GUEST COTTAGE.
	05/13/2013	13CP00887: GRADING LEVEL LAND; 13CP00888: REPAIR OF EXISTING BARN / STABLE FOUNDATIONS.
	08/06/2009	455 SQ FT POLE BARN TO CLEAR CE 050121.
	07/03/2013	VEGETATION CLEARING AND GRADING RELATED TO CONSTRUCTION OF AN ACCESS ROAD DIRECTLY OFF OF CV ROAD. THIS PERMIT INCLUDES GRADING IN TULARCITOS CREEK FLOODPLAIN.

	09/18/2008	PROPANE TANK, 3 4900 GAL WATER TANKS, GENERATOR, 953 SQ FT CARPORT.
	09/18/2008	SWIMMING POOL.
	10/01/2008	GARAGE WITH STORAGE ROOM ABOVE.
	08/21/2008	CONVERT EXISTING GARAGE TO LIVING SPACE, ADD NEW GARAGE AND WORKSPACE.
	02/05/2009	REMODEL, ADDITION TO SFD.
	04/18/2013	CONSTRUCT 964 SQ FT GREENHOUSE.
	07/23/2013	1200 SQ FT SFD.
	08/20/2012	REPLACE EXISTING DECK AND FIREPLACE.
	11/06/2012	REMODEL OF SFD.
	09/08/2010	580 SQ FT ADDITION/REMODEL TO EXISTING GARLAND RANCH REGIONAL PARK VISITOR CENTER.
	10/10/2012	MAJOR REMODEL OF SFD. USE PERMIT EXEMPTION GRANTED ON 01/30/2013.
	02/25/2013	1080 SQ FT DETACHED GARAGE/CARPORT. USE PERMIT EXEMPTION GRANTED 10/19/2012.
	03/10/2010	1521 SQ FT SFD.
	04/12/2010	DEMO, REBUILD CABIN.
	03/13/2008	272 SQ FT REMODEL, 401 SQ FT ADDITION TO 2910 SQ FT SFD.
	11/16/2009	321 SQ FT ADDITION TO 1982 SQ FT SFD (BP 091614) / GROUND-MOUNTED PV SYSTEM (10CP01441).
	04/01/2013	CORRECT 13CE00069: CONVERT GARAGE INTO LIVING SPACE.
CASTROVILLE	04/13/2010	81 SQ FT ADDITION TO 1380 SQ FT SFD.
	10/29/2009	INTERIOR REMODEL.
	03/25/2010	CONSTRUCT TWO SEDIMENT COLLECTION AREAS.
	03/25/2010	REMODEL, ADDITION TO SFD.
	02/25/2011	LCNG FUELING STATION.
	04/25/2008	REMOVE, REPLACE DECKING.
	04/19/2013	CONSTRUCT 1080 SQ FT GARAGE.
	05/02/2013	LEGALIZE BARN CONVERTED INTO SFD W/O PERMITS IN THE 1980s.
CENTRAL SALINAS VALLEY	01/06/2011	(E) MILK BARN CONVERTED INTO SFD W/O PERMIT, TO BE CONVERTED INTO STORAGE BLDG.
	10/17/2011	(E) MILK BARN CONVERTED INTO SFD W/O PERMIT, (N) DETACHED GARAGE. APPLICANT PROPOSES TO ELEVATE BOTH (E) AND (N) STRUCTURES.
GREATER SALINAS	07/03/2013	EXCAVATE FLOODPLAIN, GRADING & REVEGETATION STREAM BANKS, INSTALLING EROSION CONTROL, PLANTING TREES & SHRUBS

NORTH COUNTH LUP	05/17/2013	TO CLEAR CE 030425 "AS-BUILT" GRADING OF 750 CY FILL, INSTALL 15 ELECTRICAL RECEPTABLES, INSTALL 4 LAMP POSTS (W/RECEPTACLES), "AS-BUILT" RETAINING WALL (167 LF OF 4' HIGH WALL), CAP AREA DRAIN NEAR LEAN-TO STRUCTURE, INSTALL HOSE BIBB AT LEAN-TO STRUCTUR
NORTH COUNTY	12/19/2012	TO PARTIALLY CLEAR 12CE00220 FOR RETAINING WALL.
	04/03/2013	VARIOUS ACTIVITIES TO CORRECT CE 060213, INCLUDING THE RELOCATION OF AN EXISTING GARAGE CURRENTLY ENCROACHING ON THE FLOODWAY -- GARAGE TO BE RELOCATED OUTSIDE THE FLOODWAY.
	12/25/2008	192 SQ FT REMODEL & 478 SQ FT ADDITION TO 1548 SQ FT SFD, 504 DETACHED SHOP.
	05/13/2013	FIRE DAMAGE REPAIRS TO SFD AT "SPACE D".
	12/22/2010	REPLACE DAMAGED FIREPLACE, CHIMNEY, AND ADJACENT WALL
	01/29/2013	DEMO DETACHED GARAGE, CONSTRUCT 495 SQ FT GUESTHOUSE.
	05/08/2008	LEGALIZE 1,152 SQ.FT. HORSE STALLS AND 864 SQ.FT. MARE BARN
	05/22/2008	NEW 2,081 SQ.FT. SFD, 826 SQ.FT. GARAGE, 400 SQ.FT. TACK ROOM
NORTH COUNTY COASTAL		
	05/24/2012	UNPERMITTED EXPANDED USE OF PROPERTY WHICH INCLUDES: A. EQUIPMENT WASHING PAD AND STORING OF GREASE TANKS, B. ELECTRICAL FOR FIFTEEN (15) STORAGE SPACES, C. TWO (2) INDUSTRIAL METAL STORAGE CONTAINERS MODIFIED TO INSTALL ELECTRICAL; ONE OCCUPIED AS AN OF
	02/14/2008	CONSTRUCTION OF NEW 1,560 SQ.FT. MFD, 936 SQ.FT. GARAGE, RELOCATE SEPTIC
PAJARO	01/29/2009	SITE IMPROVEMENTS FOR PARKING AND PLAZA AREA.
	06/24/2009	ADDITIONS, RENOVATION TO EXISTING CHURCH.
	01/14/2010	VEEDER ROOT CARBON CANISTER EVR PHASE II WITHOUT ISD.
	07/11/2008	CONVERT STRUCTURE BACK TO GARAGE, LEGALIZE 42 SQ FT BATHROOM, REBUILD WATER HEATER CLOSET.
	04/06/2012	REMODEL/RESTORE 909 SQ FT SFD. (CE 070062)
	01/22/2009	CARPORT AND STEPS.
	10/14/2010	2878 SQ FT MECHANICS' SHOP ADDITION.
PRUNEDALE	07/31/2012	RE 12CE00095: CONVERT GARAGE INTO GUESTHOUSE.

	10/17/2012	888 SQ FT ADDITION TO SFD.
	07/16/2013	ADDITION OF SEDIMENT PONDS AND DRAINAGE DITCHES TO HELP DETAIN STORMWATER RUNOFF AND SEDIMENT FLOWS WITHIN EXISTING FARM FIELD DRAINAGE SYSTEM.
SALINAS	02/03/2010	NEW WELL AND WATER TANK FOR SAN JERARDO COMMUNITY.
	07/31/2012	RE CE 090235: VARIOUS PERMITS TO LEGALIZE WORK PERFORMED WITHOUT PERMITS.
	02/07/2008	TO CLEAR CE 070185; REMODEL.
	08/24/2009	7500 SQ FT METAL BLDG.
	06/19/2008	2850 SQ FT ADDITION TO EXISTING METAL 4950 SQ FT METAL BLDG, EXISTING BATHROOM TO BE REMOVED, EXISTING BREAKROOM TO BE CONVERTED TO STORAGE.
	02/03/2011	TO CLEAR CODE ENFORCEMENT: HORSE STALLS, COVERED ARENA, AND FOOTBRIDGE.
	03/06/2008	IN-GROUND SWIMMING POOL. THERE WILL BE NO NEW UTILITIES / EQUIPMENT IN THE FLOODPLAIN.
	08/08/2011	1440 SQ FT MANUFACTURED TRAILER.
	06/06/2013	PERMIT TO CLEAR RENOVATION WORK WITHOUT PERMITS.
	01/24/2008	4,224 SQ.FT. MARE HOTEL FOR SEASONAL HORSE BREEDING
	10/18/2013	REMODEL / ADDITION OF 366 SQ FT TO SFD.
	03/29/2012	TO CLEAR CE 060301: DEMO 385 SQ FT OF DECK, LEGALIZE 600 SQ FT GUESTHOUSE, 280 SQ FT ATTACHED STORAGE, 486 SQ FT ATTACHED DECK, AND 258 SQ FT DECK.
	04/18/2013	CONSTRUCT 200 SQ FT ADDITION AND 113 SQ FT COVERED PORCH TO SFD.
	11/09/2012	SOLAR PANELS.
	02/14/2008	TO CLEAR CE060220 TO INCLUDE THE CONSTRUCTION OF A RETAINING WALL 78 FEET IN LENGTH BY 7 FEET IN HEIGHT.
	06/07/2012	12CP00830: 2721 SQ FT SFD, 448 SQ FT ATTACHED GARAGE; 12CP00832: 864 SQ FT DETACHED ACCESSORY STRUCTURE.
	02/14/2008	TENANT IMPROVEMENTS OF APPROXIMATELY 1,290 SQUARE FEET, CONSISTING OF VARIOUS TOILET ROOMS, WEIGHTS AND WEIGHT ROOM; UPGRADE TWO EXISTING ACCESSIBLE STALLS ADJACENT TO MCCORMICK SUITE
	10/06/2011	2454 SQ FT SFD.
	02/19/2008	384 SQ.FT. STORAGE SHED
	12/04/2013	REMODEL OF FARM OUTBUILDING.
	11/30/2011	REPLACE ANTENNAS AND CABINETS.
	02/27/2012	2880 SQ FT HORSE BARN.
	03/13/2009	POLE-MOUNTED SOLAR PANELS.
	10/21/2010	1600 SQ FT DETACHED GARAGE
	02/03/2010	719 SQ FT ADDITION TO 1774 SQ FT SFD.

	10/18/2013	REMODEL, ADDITION TO SFD.
	11/01/2012	798 SQ FT ADDITION TO SFD.
	12/18/2012	432 SQ FT ADDTION TO SFD.
	01/29/2013	TO CLEAR 12CE00377: RENOVATION OF SFD.
	02/05/2013	2800 SQ FT ADDITION TO COMMERCIAL BLDG.
	01/14/2010	1473 SQ FT ADDITION TO 1145 SQ FT SFD.
	04/02/2010	CONVERT HISTORIC RESIDENCE TO PROFESSIONAL OFFICE.
SOUTH COUNTY	02/08/2008	NEW 2,907 SQ.FT. SFD, 824 SQ.FT. GARAGE
	09/27/2013	WELL TEST STATION #2: PIPING SUPPORTS (STRUCTURAL) AND PROJECT PIPING (MECHANICAL).
	09/27/2013	WELL TEST STATION #10: PIPING SUPPORTS (STRUCTURAL) AND PROJECT PIPING (MECHANICAL).
	06/16/2009	WATER PIPELINE FOR INJECTION WELLS.
	11/18/2013	INSTALLATION OF RESTING GUIDE AND ANCHORS FOR PIPE SUPPORTS AND FOUNDATIONS - 2014 HORIZONTAL INFILL WELLS PACKAGE 1 (STRUCTURAL AND MECHANICAL).
	11/18/2013	INSTALLATION OF RESTING GUIDE AND ANCHORS FOR PIPE SUPPORTS AND FOUNDATIONS - 2014 PRODUCTION WELLS PACKAGE 1 (STRUCTURAL AND MECHANICAL).
	04/30/2008	BELT FILTER BLDG. FOR H2S PLANT.
	10/29/2013	INSTALLATION OF RESTING GUIDE AND ANCHORS FOR PIPE SUPPORTS AND FOUNDATIONS - 2013 HORIZONTAL INFILL WELLS PACKAGE 1 (STRUCTURAL AND MECHANICAL).
	09/20/2013	2013 REPLACEMENT PRODUCTION WELLS, PACKAGE #3; INCLUDES PIPING WORK.
	10/04/2013	OFF-PLOT GATHERING AND DISTRIBUTION SYSTEMS; INLCUDES PIPING WORK.
	05/01/2009	DECK, REMODEL OF SFD.
	09/20/2013	WELL TEST STATION #8: PIPING SUPPORTS (STRUCTURAL) AND PROJECT PIPING (MECHANICAL).
	03/21/2008	312 SQ FT ADDITION TO SFD, 512 SQ FT BBQ BARN, 1344 SQ FT POOL HOUSE.
	04/20/2012	UPGRADE TO EXISTING TRUCK LOADING PAD AND RETAINING WALLS; CONCRETE PAD TO ACCOMODATE A NEW GATE SYSTEM (TO BE PERMITTED SEPARATELY IN FUTURE).
	08/26/2013	RE-ROOF SFD.
	08/30/2013	RE-ROOF SFD.
	11/05/2013	OFF-PLOT DISTRIBUTION AND GATHERING SYSTEMS - 2014 PRODUCTION WELLS PACKAGE 1.
	10/29/2013	MECHANICAL PACKAGE FOR TEMPORARY PRODUCTION FACILITIES FOR INITIAL WELLS.
	11/05/2013	OFF-PLOT DISTRIBUTION AND GATHERING SYSTEMS - 2014 INJECTION WELLS PACKAGE 1 (MECHANICAL).

	10/01/2013	REMODEL / RE-ROOF SFD.
	03/13/2009	FOUNDATION AND PIPING PLAN FOR WELL TEST STATION #7.
	06/16/2009	GRADING FOR WATER PIPELINE FOR INJECTIONS WELLS.
	08/12/2009	REMOVE 460 SQ FT, ADD 528 SQ FT TO SFD.
	08/04/2009	CASING COLLECTION SYSTEM #3, STRUCTURAL & MECHANICAL.
	03/13/2009	PIPING PLAN FOR WELL TEST STATION #7.
	03/13/2009	MECHANICAL PIPING PLAN FOR WELL TEST STATION #7.
	02/28/2008	HEATER/COOLER, COOLER FOR H2S PLANT.
	06/24/2010	2500 SQ FT METAL BARN.
	09/15/2009	CENTRAL OIL TREATING FACILITY.
	10/09/2008	PIPING PLAN FOR PRODUCTION WELL.
	11/24/2009	1152 SQ FT SFD, 528 SQ FT ATTACHED GARAGE.
	03/06/2013	CONVERT CARPORT INTO LIVING SPACE; CONSTRUCT FARM SUPPORT UNIT, GUESTHOUSE.
	01/20/2010	2300 SQ FT METAL BLDG.
	03/19/2010	2588 SQ FT SFD.
	03/19/2010	1200 SQ FT AG BLDG.
	01/17/2013	REMODEL SFD.
	04/30/2008	GRADING FOR CENTRAL OIL TREATMENT FACILITY.
	08/23/2012	IRRIGATION RESERVOIR.
	10/22/2009	REPLACE AND RELOCATE EXISTING MOBILE HOME.
	09/11/2012	3227 SQ FT SFD.
	05/24/2013	SAFU LOMBARDI STEM DRIVE DEVELOPMENT , OFF PLOT DISTRIBUTION & GATHERING SYSTEM -2013 INJECTION WELL PACKAGE #1 STRUCTURAL & MECHANICAL
	05/24/2013	SAFU LOMBARDI STEM DRIVE DEVELOPMENT, OFF PLOT DISTRIBUTION & GATHERING SYSTEM -2013 PRODUCER WELLS PACKAGE #1 STRUCTURAL & MECHANICAL
	05/15/2013	CHEVRON SAN ARDO SECTION 13 PILOT FACILITIES, PHASE 3-4 MECHANICAL PACKAGE FACILITIES PIPELINE. 04/24/2013 REVISION: PHASES 3-4 ADD STRUCTURAL TO MECHANICAL PACKAGE FOR FACILITIES PIPELINE TO RESPOND TO PLAN CHECK COMMENTS.
	06/04/2012	SOLAR PANEL SYSTEM.
	06/04/2012	1800 SQ FT WAREHOUSE.
	06/04/2012	ADA RAMP INSTALLATION.
	05/02/2011	GRADING FOR OIL AND GAS WELL.
	09/13/2012	CONSTRUCTION OF SAN ARDO SJ-NEXT GENERATION ARTIFICIAL LIFT.
	01/22/2009	MECHANICAL PIPING PLAN FOR WELL TEST STATION #7.
	02/01/2008	GRADING FOR DRAIN TANK, EARTHEN CONTAINMENT BERM.

	07/13/2008	THIOSULFATE COOLING/HEATING TOWER, PLATFORMS, AND MISC STEEL AND PIPE SUPPORTS FOR H2S PLANT.
	07/17/2008	ACCESS PLATFORM FOUNDATION PLAN FOR H2S PLANT.
	07/07/2008	STRUCTURAL FOUNDATIONS FOR GAS TRAP COOLER, PUMPS, LACT, AND PIPE SUPPORTS; RINGWALL FOUNDATION FOR EXISTING SHIPPING TANKS.
	07/22/2008	IN-GROUND SWIMMING POOL.
	04/15/2010	12000 SQ FT STORAGE BARN.
	10/19/2009	REPLACE EXISTING WASH TANK ON CONCRETE FOUNDATION.
	04/02/2013	INSTALLATION OF SOLAR PANELS.
	04/17/2013	INSTALLATION OF SOLAR PANELS.
	12/25/2008	RESTORATION TO ORIGINAL GRADE.
	09/28/2009	448 SQ FT DETACHED STORAGE BLDG/BATHROOM.
	10/13/2009	GRADING FOR WELL PADS AND SMALL EARTHEN BERM.
	10/29/2009	SOLAR PANEL SYSTEM.
	10/21/2008	PIPING PLAN FOR STEAM SPLITTERS.
TORO	08/08/2008	LAP POOL
WATSONVILLE	02/05/2009	81 LINEAL FEET OF RETAINING WALL.
	05/08/2009	322 SQ FT TWO-BEDROOM ADDITION TO 1144 SQ FT SFD.
	09/16/2009	REMODEL, ADDITION TO SFD TO CLEAR CE 050204.
	03/06/2008	GRADING FOR SFD.
	02/28/2011	CONVERT 1560 SQ FT COMMERCIAL BLDG TO SFD.
	09/17/2009	600 SQ FT GUEST HOUSE W/ ATTACHED 1432 SQ FT GARAGE/BARN.
	01/31/2008	2177 SQ FT ADDITION TO 1070 SQ FT SFD.
	05/17/2012	RE-SUBMITTAL OF EXPIRED APPLICATION TO CLEAR CE 050204. /// SEE ENTRY IN SUBSTANTIAL IMPROVEMENT DATABASE FOR INFO ON REVISION TO CSI PERCENTAGE. - MJL, 09/18/2013.

Ministerial Permits 2008-2013

Group Of AREA	DATE OF IDR	PROJECT DESCRIPTION
BIG SUR	1/7/2008	THE CONSTRUCTION OF A 3,771 SQUARE FOOT SINGLE FAMILY DWELLING WITH AN ATTACHED 280 SQUARE FOOT CARPORT, WELL AND SEPTIC SYSTEM DESIGN
	1/22/2008	DEMOLISH AN EXISTING 850 SQUARE FOOT CARETAKER'S UNIT WITH AN ATTACHED 500 SQUARE FOOT GARAGE/WORKSHOP, AND CONSTRUCT A NEW 850 SQUARE FOOT CARETAKER'S UNIT WITH A 531 SQUARE FOOT ATTACHED GARAGE/WORKSHOP, A 200 SQUARE FOOT

		PORCH, A 235 SQUARE FOOT PORCH,
BORONDA	7/1/2009	PRE-APPLICATION CONFERENCE REQUEST TO ALLOW THE CONSTRUCTION OF A 60,356 SQ FT, THREE-STORY HAMPTON INN & SUITE (92 ROOMS) WITH 100 PARKING SPACES ON A 1.86 ACRE SITE. THE PROJECT INCLUDES A LOT LINE ADJUSTMENT (PLN 090153) TO CONSOLIDATE TWO PARCELS INT
BRADLEY	7/27/2009	USE PERMIT TO ALLOW THE DRILLING OF ONE EXPLORATORY OIL AND GAS WELL #1-B ON A PARCEL. THREE WELLS ARE PROPOSED ON SEPARATE PARCELS EACH OF THE SITES, KNOWN AS SOUTH SALINAS DRILL SITE NO. 1-B, NO. 7-A, AND NO. 34-B.
CACHAGUA	9/28/2009	MINOR SUBD TO ALLOW A RECONFIGUIRATION OF APPX. 14,000 ACRES CONSISTING OF 12 EXISTING LEGAL LOTS OF RECORD RANGING IN SIZE FROM 162 TO 11,552 ACRES
	4/12/2010	TEMPORARY RESIDENCE PRIOR TO ISSUANCE OF A BUILDING PERMIT FOR A SINGLE FAMILY DWELLING
	3/7/2011	LOT LINE ADJUSTMENT BETWEEN TWO LEGAL LOTS OF RECORD.
CARMEL	4/14/2008	THE CONSTRUCTION OF A 3,232 SQUARE FOOT CLASSROOM WING CONTAINING THREE REGULAR CLASSROOMS AND THREE SMALLER SPACES FOR SPECIAL NEEDS PROGRAMS.
	5/5/2008	THE CONSTRUCTION OF A 49 SQUARE FOOT FIRST FLOOR ADDITION AND A 510 SQUARE FOOT SECOND STORY ADDITION TO AN EXISTING 1,969 SQUARE FOOT ONE STORY SINGLE FAMILY DWELLING.
	8/25/2008	A 1,289 SQUARE FOOT FIRST AND SECOND STORY ADDITION TO AN EXISTING ONE STORY SINGLE FAMILY DWELLING.
	2/2/2009	MINOR AND TRIVIAL AMENDMENT TO A PREVIOUSLY APPROVED COMBINED DEVELOPMENT PERMIT CONSISTING OF IMPROVEMENTS AND MODIFICATIONS TO AN EXISTING ROAD OF APPROXIMATELY 1.5 MILES IN LENGTH WITHIN 100 FEET OF RIPARIAN ESHA, INCLUDING GRADING OF 690 CUBIC YARDS O
	4/27/2009	THE CONSTRUCTION OF A 3,232 SQUARE FOOT CLASSROOM WING CONTAINING THREE REGULAR CLASSROOMS AND THREE SMALLER SPACES TO REPLACE THREE MODULAR STRUCTURES UPON COMPLETION OF CONSTRUCTION.

	4/27/2009	RELOCATION OF FIVE MODULAR CLASSROOMS TO INCLUDE CONNECTION TO EXISTING ELECTRICAL, FIRE ALARM, DATA AND PHONE SYSTEMS IN ORDER TO CLEAR CODE VIOLATION CE060265
	4/27/2009	REMODEL OF AN EXISTING 1558 SQ FT SINGLE FAMILY DWELLING AND 200 SQ FT GUESTHOUSE INCLUDING CHANGING THE ROOF FROM FLAT TO PITCHED, NEW EXTERIOR SIDING, DOORS AND WINDOWS, ADDITION OF 218 SQ FT TO THE EXISTING DWELLING AND A 24 SQ FT ADDITION TO THE GUEST
	3/22/2010	SUBDIVISION OF 5.2 ACRE LOT INTO 30 MARKET RATE LOTS AND 1 INCLUSIONARY HOUSING LOT CONTAINING 12 INCLUSIONARY UNITS
	6/1/2010	SUBDIVISION OF 7.92 ACRE LOT INTO 31 MARKET RATE LOTS AND ONE INCLUSIONARY HOUSING LOT CONTAINING 11 INCLUSIONARY UNITS
	8/16/2010	SUBDIVISION OF 7.92 ACRE LOT INTO 31 MARKET RATE LOTS AND ONE INCLUSIONARY HOUSING LOT CONTAINING 11 INCLUSIONARY UNITS
	12/6/2010	DEMO 2975 SQ FT SFD, CONSTRUCT 2975 SFD IN SAME FOOTPRINT
	4/25/2011	3-YEAR EXTENSION TO AMEND 080574.
CARMEL VALLEY	2/9/2008	LOT LINE ADJUSTMENT TO ADJUST THE BOUNDARIES BETWEEN TWO EXISTING LOTS OF RECORD AND A USE PERMIT FOR THE ESTABLISHMENT OF A VISITOR CENTER/PARKING AREA FOR THE CARMEL RIVER PARKWAY TRAIL PROJECT.
	2/11/2008	THE CONSTRUCTION OF A 1,440 SQUARE FOOT BARN.
	6/9/2008	USE PERMIT AND DESIGN APPROVAL FOR THE CONSTRUCTION OF A 2,488 SQUARE FOOT BARN WITHIN THE CARMEL VALLEY FLOODPLAIN.
	9/2/2008	USE PERMIT AND DESIGN APPROVAL FOR DEVELOPMENT WITHIN THE CARMEL VALLEY FLOOD PLAIN TO ALLOW THE CONSTRUCTION OF A 547 SQUARE FOOT GUESTHOUSE AND 504 SQUARE FOOT DETACHED 2-CAR GARAGE
	9/8/2008	LOT LINE ADJUSTMENT (EQUAL EXCHANGE OF LAND) BETWEEN TWO PARCELS OF 1.0 ACRE (PARCEL 1) AND 1.42 ACRES (PARCEL 2). THE PURPOSE OF THE PROJECT IS TO ALLOW THE CREATION OF A NOTCH IN EXISTING LOT LINE FOR AN IRRIGATION WELL TO GO FROM APN 189-181-014 (PAR
	9/22/2008	REVISIONS TO LOT CONFIGURATION. COMBINED DEVELOPMENT PERMIT CONSISTING OF: 1) A VESTING TENTATIVE MAP FOR A STANDARD SUBDIVISION TO SUBDIVIDE THREE LOTS OF 20.69 ACRES, 20.78 ACRES AND 62 ACRES (TOTAL 103.2 ACRES) INTO A TEN LOT SUBDIVISION OF

		1.2 TO 82.1
	11/24/2008	REPLACEMENT OF EXISTING KITCHEN 2,030 SQ.FT. CLASSROOM AND KITCHEN WITH NEW 3,355 SQ.FT. CLASSROOM AND KITCHEN, 1,340 SQ.FT. ADDITION OF A SAFE AND STORAGE AREA TO AN EXISTING GYM, THE ADDITION OF COVERED WALKWAYS AT THE MAIN ENTRANCE.
	5/26/2009	LOT LINE ADJUSTMENT BETWEEN THREE PARCELS OF 7.18 ACRES, 35.10 ACRES AND 102.33 ACRES RESULTING IN THREE PARCELS OF 27.18 ACRES, 88.46 ACRES, AND 28.97 ACRES.
	4/5/2010	2,160 SQ.FT. HAY BARN, 18,720 SQ.FT. BOARDING STABLE WITH 52 PERMANENT COVERED STABLES AND 30 TEMPORARY PENS TO BOARD UP TO 125 HORSES, 225 SQ.FT. HORSE WASHING PAD, PARKING AREA FOR APPX. 25 VEHICLES, A HORSE TRAILER PARKING AREA, AND GRADING APPX. 1500
	5/10/2010	REMOVE 683 SQ.FT. FROM THE EXISTING SINGLE FAMILY DWELLING AND CONSTRUCT 1,473 SQ.FT. SECOND STORY ADDITION, 620 SQ.FT. TWO-CAR GARAGE
	7/19/2010	ALLOW DEVELOPMENT IN CARMEL VALLEY FLOODPLAIN CONSISTING OF 1,234 SQ.FT. ADDITION TO THE MAIN LEVEL, DEMOLITION OF 609 SQ.FT. SECOND STORY, NEW 1,234 SQ.FT. SECOND STORY, A 536 SQ.FT. ATTACHED GARAGE
	9/7/2010	DEMO 800 SQ FT SFD, CONSTRUCT 750 SQ FT SFD.
	9/27/2010	EXTENSION OF USE PERMIT TO ALLOW FOR SOCIAL EVENTS, RENTAL OF EXISTING SFD, ETC.
	6/20/2011	USE PERMIT TO CORRECT 10CP00388, AN ILLEGAL CONVERSION OF A 2-STORY DUPLEX TO A SINGLE-FAMILY DWELLING.
	7/16/2012	CONSTRUCT A 262 SQ FT GARAGE ADDITION, AND A 138 SQ FT SFD ADDITION.
	8/6/2012	DEMO AN SFD, CONSTRUCT A 3,924 SQ FT SFD, 642 SQ FT ATTACHED GARAGE.
	3/4/2013	DEMO A 2,184 SQ FT SFD, CONSTRUCT A 2,784 SQ FT SFD AND 516 SQ FT ATTACHED GARAGE.
	6/3/2013	DEVELOPMENT OF A CANINE TRAINING / SPORTS FACILITY AND EVENTS CENTER.
	9/3/2013	USE PERMIT TO ALLOW PARTIAL DEMOLITION AND CONSTRUCTION OF ADDITIONS TO AN EXISTING SFD AND DETACHED GARAGE, IN THREE PHASES.
	9/23/2013	CONSTRUCT A 588 SQ FT ADDITION TO AN EXISTING SFD, A 140 SQ FT COVERED PORCH, AND A 6-FT HIGH FENCE WITH TWO ENTRY GATES.

CASTROVILLE	2/20/2008	RELOCATE A CONCRETE & ASPHALT RECYCLING OPERATION TO THE A&S METAL RECYCLING FACILITY.CRUSHUNG EQUIPMENT WILL BE USED AND MATERIAL WILL BE STOCKPILED ON SITE.
	5/11/2009	ESTABLISHMENT OF A SCHOOL (CHARRO CULTURAL RIDING SCHOOL) AND KEEPING OF LIVESTOCK.
	8/3/2009	DETERMINE LOT LEGALITY OF HISTORICAL LOTS A (0.116 ACRES), B (0.116 ACRES), AND C (0.077 ACRES); OF AN EXISTING 9.82 ACRE PARCEL (LOT D) LOCATED MOSTLY WITHIN THE COASTAL ZONE. ALLOW A LOT LINE ADJUSTMENT TO ADJUST LOT A (0.171ACRES), LOT B (0.286 ACRES)
	7/25/2011	LOT LINE ADJUSTMENT BETWEEN 3 LEGAL LOTS OF RECORD.
CENTRAL SALINAS VALLEY	1/7/2008	LOT LINE ADJUSTMENT TO MERGE 2 LOTS OF RECORD CREATING FOUR LOTS; AND LOT LINE ADJUSTMENT TO ADJUST LOT LINES OF FOUR LOTS
	6/7/2010	LOT LINE ADJUSTMENT BETWEEN FOUR EXISTING LEGAL LOTS OF RECORD OF 35.85, 0.99 ACRES, 0.43 ACRES AND 24.36 ACRES, RESULTING IN 46.63 ACRES, AND THREE LOTS OF 5.00 ACRES.
	6/28/2010	REMOVAL OF EXISTING 840 SQ.FT. MOBILE HOME AND INSTALL A 1,344 SQ.FT. MANUFACTURED HOME (WHICH IS GREATER THAN TEN YEARS OLD) AND RELOCATE TWO EXISTING PORTABLE AIRPLANE HANGERS
	3/15/2011	PRE-APPLICATION CONFERENCE REGARDING A REQUEST TO BUILD A LANDFILL GAS POWER PLANT THAT WILL CONVERT LANDFILL GAS INTO ELECTRICITY. THE LANDFILL GAS TO ENERGY (LFGTE) FACILITY WOULD BE LOCATED NEAR THE EXISTING LFG FLARE AND WILL PRODUCE ENERGY FROM THE
	3/21/2011	198-FT HIGH METEOROLOGICAL TOWER.
	3/21/2011	198-FT HIGH METEOROLOGICAL TOWER.
	3/21/2011	198-FT HIGH METEOROLOGICAL TOWER.
	7/5/2011	REQUEST TO BUILD A LANDFILL GAS POWER PLANT THAT WILL CONVERT LANDFILL GAS INTO ELECTRICITY. THE LANDFILL GAS TO ENERGY (LFGTE) FACILITY WOULD BE LOCATED NEAR THE EXISTING LFG FLARE AND WILL PRODUCE ENERGY FROM THE LFG GENERATED AT THE LANDFILL USING ONE
	7/18/2011	AMEND WILLIAMSON ACT USE LIST FOR AN AGRICULTURAL PRESERVE.
	9/6/2011	LOT LINE ADJUSTMENT BETWEEN THREE PARCELS.
	3/5/2012	ALLOW AN AG SUPPORT FACILITY WITHIN EXISTING STRUCTURES.

	7/30/2012	PARTIAL DEMOLITION (15,907 SQUARE FEET) AND RECONSTRUCTION (15,043 SQUARE FEET) OF STRUCTURES AT AN EXISTING AGRICULTURAL PROCESSING PLANT AND THE IMPLEMENTATION OF VEHICULAR CIRCULATION IMPROVEMENTS.
	9/10/2012	INSTALLATION OF 2 WIND TURBINES.
CENTRAL SALINAS VALLEY, AGRICULTURAL AND WINERY CORRIDOR	5/13/2013	CONVERSION OF THREE EXISTING STRUCTURES TO A SMALL ARTISAN WINERY THAT WILL ALSO HOST SPECIAL WINERY-RELATED EVENTS.
GREATER MONTEREY PENINSULA AREA PLAN AND CACHAGUA AREA PLAN	5/25/2012	USE PERMIT FOR THE REMOVAL OF THE SAN CLEMENTE DAM, USE PERMIT FOR DEVELOPMENT ON 25% SLOPES, AND USE PERMIT FOR THE REMOVAL OF PROTECTED TREES.
GREATER SALINAS	5/5/2008	CORRECT ZONING VIOLATION CE070044 TO ALLOW A NON-SOIL DEPENDENT NURSERY.
	9/8/2008	LOT LINE ADJUSTMENT BETWEEN TWO LEGAL LOTS OF RECORD OF APPROXIMATELY 111.47 ACRES (ASSESSOR'S PARCEL NUMBER 177-132-025-000) AND 49.42 ACRES (ASSESSOR'S PARCEL NUMBER 177-132-026-000) RESULTING IN TWO LEGAL LOTS OF RECORD OF APPROXIMATELY 80.24 ACRES (PA
GREATER SALINAS AREA	7/14/2008	LOT LINE ADJUSTMENT TO ADJUST THE BOUNDARIES BETWEEN TWO PARCELS OF 203.24 ACRES (PARCEL 1) AND 1.05 ACRE (PARCEL 2) RESULTING IN PARCELS OF 86 ACRES (PARCEL A) AND 118.3 ACRES (PARCEL B) RESPECTIVELY.
GREENFIELD	4/20/2009	ALLOW THE DIVISION OF A 61.14 ACRE PARCEL INTO FOUR PARCELS OF 7 ACRES EACH AND A REMAINDER PARCEL OF 33.14 ACRES.
	6/29/2009	ALLOW THE DIVISION OF A 61.14 ACRE PARCEL INTO THREE PARCELS OF 15.28 ACRES, AND ONE OF 15.30 ACRES.
LAS LOMAS	10/8/2012	CONSTRUCT A TELECOMMUNICATIONS FACILITY.
MOSS LANDING	2/20/2008	MASTER PLAN TO SUPPORT COASTALLY DEPENDENT OCEAN SCIENCE RESEARCH, COMPRISED OF 3 PHASES: NEW 57,000 SQ FT RESEARCH FACILITY AND THE REMOVAL OF A FINGER PIER; NEW 34,000 SQ FT REPLACEMENT BUILDING THAT CURRENTLY HOUSES PHIL'S FISH MARKET; AND NEW 66,500

	11/9/2009	PHASE I: REMOVAL OF FINGER PIER (133-231-001-000), PHASE 1A&1B: CONSTRUCTION OF A 58,655 SQ.FT. RESEARCH FACILITY (133-242-001-000 & 133-242-008-000), PHASE II: CONSTRUCTION OF 34,000 SQ.FT. REPLACEMENT OF EXISTING BLDG (133-232-001-000), AND PHASE III: C
NORTH COUNTY	1/7/2008	TO ALLOW THE DEMOLITION AND RECONSTRUCTION OF 2 LEGAL NON-CONFORMING SINGLE FAMILY DWELLINGS CONSISTING OF: 1) THE DEMOLITION OF A 986 SQUARE FOOT ONE-STORY SINGLE FAMILY DWELLING AND AN 80 SQUARE FOOT SHED TO BE REPLACED WITH A 2,800 SQUARE FOOT ONE-STO
	2/4/2008	MINOR SUBDIVISION OF ONE 19.04 ACRE PARCEL INTO 3 PARCELS (5.43, 5.25, AND 8.36 ACRES).
	3/3/2008	A MIXED-USE DEVELOPMENT FOR 40, 100% AFFORDABLE APARTMENTS AND TOWNHOUSES AND 750 SQUARE FEET RETAIL/OFFICE/COMMERCIAL USES; 2) A LOT LINE ADJUSTMENT TO COMBINE THREE EXISTING LOTS AND ADJUST LOT LINE FOR FOURTH LOT; THE PROJECT INCLUDES A 1,850 COMMUNIT
	5/5/2008	A MINOR SUBDIVISION TENTATIVE MAP TO SUBDIVIDE ONE 62.24 ACRE PARCEL INTO ONE 57.24 ACRE PARCEL (PARCEL A) AND ONE 5 ACRE PARCEL (PARCEL B).
	5/19/2008	REVISION OF PLANNING FILE NO. PLN060552 CONSISTING OF A USE PERMIT FOR 30 APARTMENT UNITS ON A 1.53 ACRE LOT
	5/27/2008	THE ESTABLISHMENT OF AN OPEN AIR RETAIL FACILITY (WHOLESALE NURSERY).
	7/7/2008	RELOCATE A CONCRETE & ASPHALT RECYCLING OPERATION FROM 10735 OCEAN MIST PARKWAY IN CASTROVILLE TO THE A&S METAL RECYCLING FACILITY LOCATED ON COMMERICAL PARKWAY.
	12/15/2008	25 FOOT ADDITION TO AN EXISTING 25-FOOT TELECOMMUNICATION TOWER, REPLACE 3 EXISTING ANTENNAS WITH 4 NEW PANEL ANTENNAS
	8/31/2009	CONSTRUCTION OF A 1,960 SQ.FT. MODULAR OFFICE BUILDING AT THE UNION PACIFIC WATSONVILLE JUNCTION FACILITY.
	8/2/2010	LOT LINE ADJUSTMENT BETWEEN TWO LEGAL LOTS OF RECORD CONSISTING OF ONE 67.4 ACRE PARCEL AND ONE 135.71 ACRE PARCEL RESULTING IN ONE LOT OF 81.98 ACRES AND ONE LOT OF 121.13 ACRES.
	9/20/2010	LOT LINE ADJUSTMENT BETWEEN TWO LOTS OF RECORD.
	11/8/2010	3038 SQ FT OF STORAGE AREA, 475 SQ FT TRASH ENCLOSURE
	3/14/2011	9676 AG SUPPORT FACILITY W/ 576 SQ FT MECHANICAL ROOM.

	7/18/2011	2-STORY 10610 SQ FT COMMERCIAL BLDG, 43 PARKING SPACES.
	1/23/2012	REMOVAL OF 1,225 EUCALYPTUS TREES OVER A 10-YEAR PERIOD.
	5/21/2012	DEMO A 960 SQ FT SFD, 891 SQ FT STORAGE SHED, 826 SQ FT DETACHED GARAGE; CONSTRUCT A 1,560 SQ FT SFD, 624 SQ FT DETACHED GARAGE.
	5/21/2012	LOT LINE ADJUSTMENT BETWEEN TWO LEGAL LOTS OF RECORD.
	9/10/2012	LOT LINE ADJUSTMENT BETWEEN THREE LEGAL LOTS OF RECORD.
	8/26/2013	AMENDMENT TO A PREVIOUSLY APPROVED USE PERMIT TO ALLOW A CHANGE OF A LEGAL NON-CONFIRMING USE TO A LEGAL NON-CONFORMING OF A SIMILAR NATURE, UTILIZED BY ROOFING PROFESSIONALS; AND TO REMOVE CONDITION #25.
NORTH COUNTY COASTAL	3/8/2010	CHANGE OF USE WITHIN AN EXISTING COMMERCIAL BUILDING, ALLOW RESIDENTIAL UNIT ON SECOND FLOOR OF A COMMERCIAL STRUCTURE, INTERIOR MODIFICATIONS TO FIRST AND SECOND FLOORS, 18-SPACE PARKING AREA.
NORTH COUNTY COASTAL ZONE	11/8/2010	PHASE I: REMOVAL OF FINGER PIER, 4,000 SQ.FT. FIELD PROGRAM BLDG; PHASE II: MBARI 30' DOCK EXTENSION, 34,000 SQ.FT. SCIENCE TECH BLDG, AND PHASE III: 7,500 SQ.FT. MARINE OPERATIONS BLDG, 40,000 SQ.FT. RESEARCH/OFFICE LAB BLDG, & 66,500 SQ.FT. SCIENCE/ENGI
NORTH COUNTY NON-COASTAL	9/14/2009	CLEAR CE 020237 FOR A NEW/USED 8,300 SQ.FT. SALES CAR LOT AND 2,688 SQ.FT. SALES OFFICE SERVICE CENTER AND SERVICE WAITING AREA
	4/26/2010	ALLOW CONVERSION OF 1,520 SQ.FT. BUILDING FROM SENIOR CENTER TO A MEDICAL CLINIC FOR CLINICA DE SALUD
	1/24/2011	LOT LINE ADJUSTMENT BETWEEN TWO LEGAL LOTS OF RECORD
PAJARO	4/26/2010	4.9 ACRE DEVELOPMENT CONSISTING OF A COMMUNITY PARK WITH RESTROOM BUILDING, 53 CAR PARKING LOT, ETC.
ROYAL OAKS	3/16/2009	DEVELOPMENT OF A DETACHED 800 SQ FT SENIOR CITIZEN UNIT WITH AN ATTACHED GARAGE (1432 SQ FT).
	11/2/2009	VOLUNTARY WETLAND RESTORATION PROJECT ON APPROXIMATELY 40 ACRES OF A 195 ACRE PARCEL. THE RESTORATION CONSISTS OF RESTORING, IMPROVING AND MAINTAINING NATIVE PLANT AND ENDANGERED HABITAT WHILE RECONNECTING THE CARNEROS CREEK TO ITS HISTORIC FLOODPLAIN

SALINAS	3/23/2009	A MINOR SUBDIVISION TO DIVIDE A 334.95 ACRE PARCEL INTO FOUR LOTS OF 20 ACRES EACH, 29.9 ACRES, AND ONE REMAINDER PARCEL OF 244.12 ACRES. A USE PERMIT FOR DEVELOPMENT ON 30 PERCENT SLOPES OR GREATER (ROAD). AN ADMINISTRATIVE PERMIT TO EXPAND AN EXISTING
	6/1/2009	VARIANCE FOR THE REDUCTION OF THE REQUIRED FRONT YARD SETBACKS FROM 50 FT TO 35 FT FOR A DETACHED NONHABITABLE ACCESSORY STRUCTURE AND DESIGN APPROVAL TO ALLOW THE CONSTRUCTION OF A 600 SQ FT TWO-CAR GARAGE.
	7/13/2009	LOT LINE ADJUSTMENT TO MOVE A PROPERTY LINE THAT CURRENTLY RUNS THROUGH FIVE STRUCTURES IN THE F/40 ZONE. THE ADJUSTMENT IS BETWEEN TWO LEGAL LOTS OF RECORD OF APPROXIMATELY 2.83 ACRES (PARCEL A) AND 223.82 ACRES (PARCEL B), RESULTING IN TWO LEGAL LOTS O
SOLEDAD	7/20/2009	USE PERMIT TO ALLOW THE CONSTRUCTION OF TWO 60-METER TALL TEMPORARY POLE TOWERS TO COLLECT WIND AND OTHER METEOROLOGICAL DATA.
SOUTH COUNTY	10/27/2008	ALLOW DRILLING OF THREE EXPLORATORY OIL AND GAS WELLS.
	6/13/2011	LOT LINE ADJUSTMENT BETWEEN TWO LEGAL LOTS OF RECORD.
	8/22/2011	LOT LINE ADJUSTMENT BETWEEN TWO LEGAL LOTS OF RECORD.
	11/7/2011	MINOR SUBDIVISION TO SUBDIVIDE 160-ACRE PARCEL INTO FOUR 40-ACRE PARCELS.
	2/13/2012	LOT LINE ADJUSTMENT BETWEEN TWO LEGAL LOTS OF RECORD, GENERAL PLAN AMENDMENT/REZONING TO CHANGE LAND USE DESIGNATION AND ZONE FROM FARMLAND TO PUBLIC/QUASI-PUBLIC.
	9/17/2012	LOT LINE ADJUSTMENT BETWEEN FOUR LEGAL LOTS OF RECORD.
	4/8/2013	LOT LINE ADJUSTMENT BETWEEN TWO LEGAL LOTS OF RECORD.
	6/3/2013	LOT LINE ADJUSTMENT BETWEEN TWO LEGAL LOTS OF RECORD.
	9/3/2013	LOT LINE ADJUSTMENT BETWEEN THREE LEGAL LOTS OF RECORD.
SOUTH COUNTY AREA PLAN	8/27/2012	USE PERMIT TO ALLOW THE CONSTRUCTION OF A 280 MW SOLAR ENERGY FACILITY (SEF) ON 22 PARCELS OF JACK RANCH; PHOTO VOLTAIC (PV) SOLAR PANELS CLUSTERED IN A SERIES OF BLOCKS DISTRIBUTED OVER 1,900 ACRES OF THE APPROX. 2,675 ACRE SITE, AN INTERNAL ELECTRICAL C

SPRECKELS	2/9/2009	GENERAL DEVELOPMENT PERMIT TO ABATE VIOLATION AND LEGALIZE THE EXISTING STRUCTURES AND USES. STRUCTURES INCLUDE A 4900 SQ FT TWO-STORY OFFICE COMPLEX AND A 2400 SQ FT SINGLE STORY OFFICE BUILDING. USES INCLUDE: COMMERCIAL STORAGE AND OPERATION (YARDS A-
TORO	9/15/2008	LOT LINE ADJUSTMENT BETWEEN THREE LEGAL LOTS OF RECORD (2-12.3 ACRES AND 1- APPROXIMATELY 377 ACRES), RESULTING IN THREE LOTS OF 95, 135 AND 172 ACRES.
	12/14/2009	LOT LINE ADJUSTMENT AND MERGER BETWEEN FOUR (4) LEGAL LOTS OF RECORD OF 140.02 ACRES
	6/20/2011	LOT LINE ADJUSTMENT OF FOUR LOTS OF RECORD, MINOR SUBDIVISION OF ONE OF THE FOUR ADJUSTED PARCELS.
	12/3/2012	LOT LINE ADJUSTMENT OF FOUR LOTS OF RECORD.

APPENDIX E – PLAN ADOPTION MATERIALS