Orange County Repetitive Loss Area Analysis



TETRA TECH

Orange County Repetitive Loss Area Analysis

#105IS045017

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EXECUTIVE SUMMARY

The purpose of this repetitive loss area analysis (RLAA) is to help participating communities and homeowners understand and reduce flood risk in repetitive loss (RL) areas in Orange County and participating communities and to identify potential solutions. The primary goal of a FEMA RLAA is to identify and evaluate locations within a community that experience repeated flood-related losses so the community can prioritize, design, and implement cost-effective flood mitigation measures that reduce future damage, lower National Flood Insurance Program (NFIP) claims, and increase public safety and resilience. For communities participating in FEMA's Community Rating System (CRS) program, an RLAA can enhance credit opportunities under CRS Activity 510, Floodplain Management Planning, contributing to the CRS community's floodplain management goals and potentially supporting an increased discount to NFIP flood insurance policy holders.

FEMA defines an RL property as a property that had at least two paid flood claims of more than $1,000 each in any 10-year period since 1978 (FEMA n.d.-a). An RL area consists of RL properties and all surrounding properties that are likely to face the same flood risks. FEMA's Community Rating System (CRS) defines three categories for RL communities based on the number of unmitigated RL proprieties identified:

- A Category A CRS community has no RL properties or has only RL properties that have been mitigated.
- A Category B CRS community is a community with at least 1 and less than 50 unmitigated RL properties.
- A Category C CRS community is a community with 50 or more unmitigated RL properties.

Category B and C CRS communities must meet the following requirements (FEMA 2025):

- Category B and C CRS communities must:
  - Prepare a map of RL areas.
  - Review and describe the RL problem.
  - Prepare a list of addresses of all properties with insurable buildings in RL areas.
  - Undertake an annual outreach project to those addresses and submit a copy of the outreach project each year's recertification.
- Category C CRS communities must:
  - Prepare and adopt an RLAA for all RL areas or prepare and adopt an FMP.

The RLAA follows a five-step process:

- **Step 1:** Advise all the property owners in the RL areas that the analysis will be conducted and request their input on the hazard and recommendation actions.
- **Step 2:** Contact agencies and organizations that may have plans or studies that could affect the cause or impacts of flooding. The agencies or organizations must be identified in the analysis report.
- **Step 3:** Visit each building in the RL area and collect basic data.
- **Step 4:** Review alternative approaches and determine whether any property protection measures or drainage improvements are feasible.
- **Step 5:** Document the findings. A separate analysis must be conducted for each area. In general, separate reports are preferred for each area, but in cases in which several areas have similar building and flooding characteristics and similar mitigation measures are appropriate, the analysis can be assembled into a single report.

ES Table 1 has the RL information for unincorporated Orange County and the participating cities. Unincorporated Orange County has 6 RL properties and is a Category B CRS community. The cities of Newport Beach, San Juan Capistrano, and Santa Ana are Category B CRS communities, with Newport Beach having 8 RL properties, San Juan Capistrano having 1 RL property and Santa Ana having 6 RL properties.

ES Table 1. Orange County and Participating Jurisdiction Repetitive Loss Properties

Community Name and ID Number	CRS Community Category	Number of RL Properties
Unincorporated Orange County (060212)	B	6
City of Newport Beach (060227)	B	8
City of San Juan Capistrano (060231)	B	1
City of Santa Ana (060232)	B	6

Source: FEMA Provided Repetitive Loss Data, 2024, NFIP RL (Y)

ES Table 2 presents a flood insurance overview for Orange County and the participating jurisdictions. The City of Newport Beach has the greatest number of active flood insurance policies with 1,131. Unincorporated Orange County and the City of Santa Ana have the greatest number of paid claims with 431 and 421, respectively. Unincorporated Orange County has the highest total losses paid on claims, with $3,495,883.

ES Table 2. Orange County and Participating Jurisdiction Insurance Overview

Community Name and ID Number	CRS Community Category	Number of Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Unincorporated Orange County (060212)	B	254	$250,032	$78,548,000	431	$3,495,883
City of Newport Beach (060227)	B	1,131	$955,750	$375,393,000	288	$1,773,614
City of San Juan Capistrano (060231)	B	161	$236,687	$49,671,000	33	$187,540
City of Santa Ana (060232)	B	550	$353,231	$144,075,000	421	$1,243,086

Source: FEMA Community Information System as of 5/2/2025

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DEFINITIONS

The following definitions are used throughout this assessment:

- **B, C, and X Flood Zone**—Represents areas on the FEMA FIRM that are located outside of the SFHA and include areas inundated by the 0.2 percent annual chance flood and areas with low to moderate risk of flooding.
- **Building**—For NFIP purposes a building is a structure with 2 or more outside rigid walls and a fully secured roof, that is affixed to a permanent site; or a manufactured home built on a permanent chassis, transported to its site and affixed to a permanent foundation; or a travel trailer without wheels, built on a chassis and affixed to a permanent foundation that is regulated under the community's floodplain management and building ordinance or laws.
- **Community Rating System (CRS)**—A program developed by FEMA to provide incentives for those communities in the Regular Program that have gone beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding.
- **Federal Emergency Management Agency (FEMA)**—An agency within the U.S. Department of Homeland Security charged with responding to Presidentially – declared disasters and administers the NFIP.
- **Flood Insurance Rate Map (FIRM)**—Official map of a community on which FEMA has delineated the Special Flood Hazard Areas (SFHAs), the base flood elevations and the risk premium zones applicable to the community.
- **National Flood Insurance Program (NFIP)**—The program that makes federally-backed flood insurance available in those states and communities that agree to adopt and enforce floodplain management ordinances to reduce future flood damage.
- **Personally Identifiable Information (PII)**—Any information that may be used to identify an individual, including, but not limited to a first or last name, a home or other physical address, an email address, a phone number or other contact information, and credit card or other payment information.
- **Pre-FIRM Structure**—A structure for which construction or substantial improvement occurred on or before December 31, 1974 or before the effective date of an initial FIRM.
- **Post-FIRM Structure**—A structure for which construction or substantial improvement occurred after December 31, 1974 or on or after the effective date of an initial FIRM whichever is later.
- **Repetitive Loss Property**—A repetitive loss (RL) property is a property that had at least two paid flood claims of more than $1,000 each in any 10-year period since 1978.
- **Special Flood Hazard Area (SFHA)**—An area having special flood, mudflow or flood-related erosion hazards and shown on a Flood Hazard Boundary Map or a Flood Insurance Rate Map (FIRM) Zone A, AO, A1-A30, AE, A99, AH, AR/A, AR/AE, AR/AH, AR/AO, AR/A1-A30, V1-V30, VE, or V. The SFHA is the area that will be inundated by the 1 percent annual chance flood and where the NFIP floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies.
- **Severe Repetitive Loss Property**—A Severe Repetitive Loss (SRL) property is a property that had four or more separate claim payments have with the amount of each such claim exceeding $5,000 and with the cumulative amount of such claims payments exceeding $20,000 or at least two separate claims payments have been made with the cumulative amount of such claim payments exceed the fair market value of the insured building on the day before each loss.

1. INTRODUCTION

1.1 NATIONAL FLOOD INSURANCE PROGRAM BACKGROUND

The NFIP is a voluntary program for reducing flood damage through floodplain management regulations and providing flood insurance to protect property owners against flood losses. Flood insurance through the NFIP is available in communities that adopt and enforce floodplain management regulations. When FEMA has identified high flood risk areas in a community, known as the Special Flood Hazard Area (SFHA), NFIP participation is required in order for the community and its residents to be eligible for certain federal grants, disaster assistance, and federal mortgages (FloodSmart 2023).

NFIP participating communities under the Repetitive Loss Area Analysis for Orange County include:

1. Unincorporated Orange County, joined the NFIP on September 29, 1978, and FEMA's CRS program October 1, 1991
2. City of Newport Beach joined the NFIP on September 1, 1978, and FEMA's CRS program October 1, 1993
3. City of San Juan Capistrano joined the NFIP on December 15, 1978, and FEMA's CRS program October 1, 1991
4. City of Santa Ana joined the NFIP on August 20, 1979, and does not currently participate in FEMA's CRS program

1.2 COMMUNITY RATING SYSTEM

The Community Rating System (CRS) is a voluntary incentive program that recognizes communities that have floodplain management practices and regulations that exceed the minimum requirements of the NFIP. The benefit of participating in the CRS program is a discount on flood insurance premiums for policies located in the participating community. The CRS program has three goals (FEMA CRS 2025):

- Reduce and avoid flood damage to insurable property
- Strengthen and support insurance aspects of the NFIP
- Foster comprehensive floodplain management

To join the CRS program, a community must have local floodplain management activities that can be credited under the CRS program. The CRS program has 19 creditable activities in four categories (FEMA 2025):

- Public information
- Mapping and regulations
- Flood damage reduction
- Warning and response

The CRS program rates communities on a 1 to 10 scale to determine the discount that active policies in the participating communities receive (FEMA 2025). Class 10 is the lowest class and is assigned to communities that do not joint the program or do not have enough CRS credits to receive a premium discount (FEMA 2025) (FEMA CRS 2025). Class 1 is the highest class, requires the greatest number of credits, and provides the highest premium discount. Table 1-1 shows the class, required credits, and insurance premium discount for the CRS program.

California has 97 communities that participate in the CRS program, and many of these communities maintain a Class 7 (34.0 percent) or a Class 8 (23.7 percent) rating (CRS VIZ 2025). Program participants receive a NFIP flood insurance policy discount for policyholders within their jurisdiction. The CRS discount may range from 5-45% and is based on the CRS classification Table 1-1 demonstrates the CRS classifications and partnered premium discount available to NFIP policies. Orange County is currently a Class 5; City of Newport Beach currently a Class 6; and the City of San Juan Capistrano is currently a Class 8 (FEMA Community Status Book 2026).

Table 1-1. CRS Credit Points, Classes, and CRS Discount (Premium Reduction)

CRS Credit Points	CRS Class	CRS Premium Discount
4,500+	1	45%
4,000 – 4,499	2	40%
3,500 – 3,999	3	35%
3,000 – 3,499	4	30%
2,500 – 3,000	5	25%
2,000 – 2,499	6	20%
1,500 – 1,999	7	15%
1,000 – 1,499	8	10%
500 – 999	9	5%
0 – 499	10	0%

Source: (FEMA CRS 2025)

1.3 REPETITIVE LOSS PROPERTIES

FEMA has two classes of properties for which multiple flood loss claims have been filed (FEMA n.d.-a):

- A repetitive loss (RL) property is a property that has had at least two paid flood losses of more than $1,000 each in any 10-year period since 1978.
- A severe repetitive loss (SRL) property is a property that had four or more separate claim payments with the amount of each claim exceeding $5,000 and the cumulative amount of payments exceeding $20,000, or at least two separate claims payments with a cumulative amount exceeding the fair market value of the insured building on the day before each loss.

Over a quarter of all NFIP payments since 1978 have been paid to repetitive loss properties, even though such properties make up fewer than 2 percent of all NFIP insurance policies. (FEMA 2025).

1.3.1 CRS Community Repetitive Loss Categories and Associated Requirements

FEMA maintains a list of RL properties for communities in the CRS and updates the list every year. A community that wishes to join the CRS program or that requires a regular CRS verification visit (which verifies the community's ongoing CRS activities and credits) must review FEMA's RL property list, make edits as warranted to ensure its accuracy, and determine its repetitive loss category. The repetitive loss category is a classification based on the number of unmitigated repetitive loss properties within the jurisdiction of the community (FEMA 2025):

- A Category A community has no RL properties or has only RL properties that have been mitigated.
- A Category B community is a community with at least 1 and less than 50 unmitigated RL properties.

- A Category C community is a community with 50 or more unmitigated RL properties.

The CRS program has no special requirements for Category A communities except for submitting information to update the community's repetitive loss list as needed (FEMA 2025).

The CRS program has the following requirements for Category B communities (FEMA 2025):

- Prepare a map of the RL areas.
- Review and describe its repetitive loss problem.
- Prepare a list of addresses of all properties with insurable buildings in the areas.
- Undertake an annual outreach project to those addresses. A copy of the outreach project is submitted with each year's recertification.

The CRS program has the following requirements for Category C communities (FEMA 2025):

- Prepare a map of the RL areas.
- Review and describe its repetitive loss problem.
- Prepare a list of the addresses of all properties with insurable buildings in those areas. Insurable structures include:
  - For NFIP Purposes a building is a structure with two or more outside rigid walls and a fully secured roof that is affixed to a permanent site, or a manufactured home built on a permanent chassis, transported to its site and affixed to a permanent foundation, or a travel trailer without wheels, built o a chassis and affixed to a permanent foundation that is regulated under a community's floodplain management and building ordinance or laws.
- Undertake an annual outreach project to those addresses and a copy of the outreach project is submitted with each year's recertification.
- Prepare and adopt a repetitive loss area analysis (RLAA) for all RL areas or prepare and adopt a floodplain management plan that includes full credit for planning Step 5(c) of the Activity 510 Floodplain Management Planning (FMP) steps. Floodplain management plans and RLAAs are listed in the Activity 510 Floodplain Management Planning of the CRS Coordinator's Manual.

1.3.2 Repetitive Loss Area Map

The repetitive loss area map is a map of properties included on the FEMA RL properties list along with nearby properties that have the same or similar flooding conditions. The reason to include the nearby properties in the repetitive loss area map is twofold (FEMA 2025):

- A nearby property that is not on the FEMA RL properties list may be at risk to similar flooding conditions, have been uninsured at the time of the flood event, have only one flood insurance claim, or have multiple claims under different policies that were missed in the review.
- Flood insurance data contains Personally Identifiable Information (PII) such as names and addresses, is subject to the Privacy Act of 1974, and must be protected; however, the community can display aggregated data like the RL area on a map that does not show which properties submitted flood insurance claims.

1.3.3 Repetitive Loss Area Analysis

An RLAA, credited under CRS Activity 510, Floodplain Management Planning, is a detailed mitigation plan for an RL area. The RLAA provides more specific guidance on how to reduce damage from repetitive flooding than a

floodplain management plan (FMP) or a hazard mitigation plan (HMP). A community must follow a five-step process for the RLAA to receive credit (FEMA 2025):

- **Step 1:** Advise all the property owners in the RL areas that the analysis will be conducted and request their input on the hazard and recommendation actions. The following summarizes the completed efforts for resident engagement:
  - The community's CRS Activity 502 RL area mailing address list was utilized for the RLAA notification.
  - The RLAA survey was included in the RLAA mailer.
  - The draft RLAA report and RLAA survey were highlighted on the County's website and StoryMap for public access.
  - County staff, with Tetra Tech, hosted three in-person public open houses to encourage citizen engagement.
  - Social media posts were published by Orange County Public Works. The social media posts identified the project, intent, and schedule of the public open houses.
- **Step 2**: Contact agencies or organizations that may have plans or studies that could affect the cause or impact of the flooding. The agencies or organizations must be identified in the analysis report.
  - The following agencies were identified as direct stakeholders within the planning area and were invited to participate in the planning process by providing studies or plans related to Orange County watersheds that may be pertinent to the RLAA development.
    - Water Emergency Response Organization of Orange County
    - Orange County Sheriff's Department
    - National Weather Service - San Diego Office
    - California Water Science Center
    - California Data Exchange Center
    - California Silver Jackets
    - California Department of Water Resources
    - Santa Ana Watershed Project Authority
    - California Department of Conservation
    - California Office of Emergency Management
    - USGS California Water Science Center
- **Step 3**: Visit each building in the RL area and collect basic data.
  - Building data was collected via the U.S. Army Corps of Engineers (USACE) National Structure Inventory (NSI) and ESRI ArcGIS Pro was used to select structures in the RL area. An initial buffer of half mile around the center of an RL area(s) was mapped for participating jurisdictions to draft the initial building stock inventory. The RL area building structure inventory for the four RLAA participating communities was developed under the USACE NSI data source, additional GIS layers and aerial photography.
  - The final RL areas were defined by each participating CRS community and in partnership with their existing CRS Activity 501, Repetitive Loss Area prerequisites.
  - A detailed review of the NFIP RL claims data was completed for each participating RLAA community. This resulted in the completing of Repetitive Loss Updated Transmittal sheets for addresses not within correct corporate limits.
  - A review of the communities' current CRS Activity 501 documentation was completed. The City of Santa Ana does not participate in the CRS program.
  - A detailed desktop review of the areas was completed. Data review that included the NSI structure data, public tax assessor data, aerial photography, RL parcels, conveyance systems, potential

flooding sources, and best available data was completed with each participating community including collection of the following data for RL properties:

- Site information sufficient to do a preliminary determination of the cause of the repetitive flooding and of appropriate mitigation measures, including a review of drainage patterns around the building, the condition of the structure, and the condition and type of foundation.
- The date for each building's insurance claims and the amount of the claims.

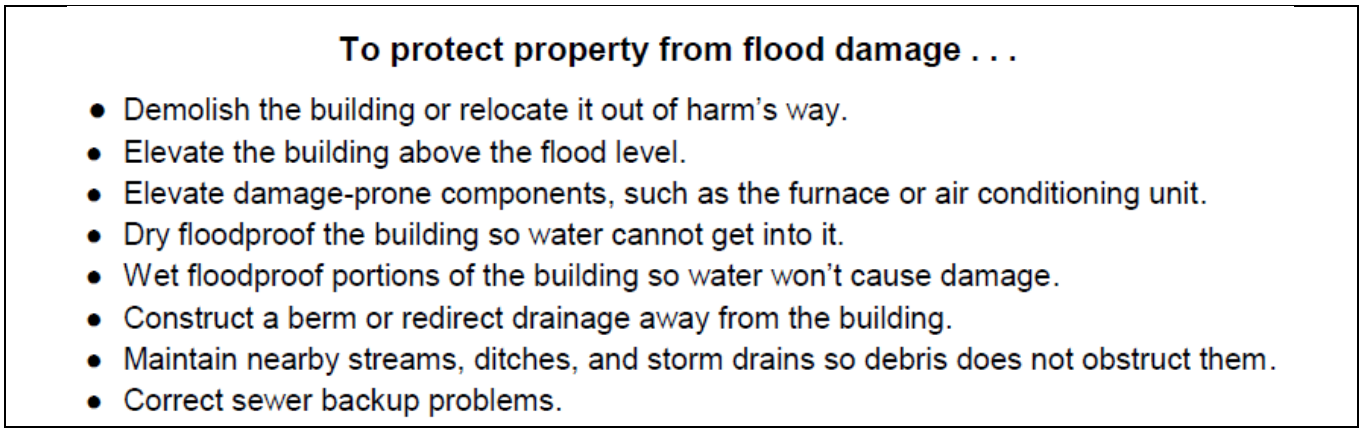
- **Step 4**: Review alternative approaches and determine whether any property protection measures or drainage improvements are feasible. The review must look at all of the property protection measures listed in Figure 1-1 and Figure 1-2 that are appropriate for the types of buildings affected.
  - Following the 2025 CRS Manual's credit criteria and guidance for Activity 510, Repetitive Loss Area Analysis, expanded alternative mitigation measures and approaches were developed following Step 3 building assessments.
- **Step 5**: Document the findings. A separate analysis has been completed for each participating CRS community and the City of Santa Ana. Each area meets the credit criteria without an impact adjustment.
  - Action items that include who is responsible for implementing the actions, when it will be done, and how it will be funded.

Figure 1-1. CRS Coordinator's Manual Figure 510-2 Categories of Floodplain Management Activities

1. **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, and/or code enforcement offices.
   - Floodplain mapping and data
   - Open space preservation
   - Floodplain regulations
   - Erosion setbacks
   - Planning and zoning
   - Stormwater management
   - Drainage system maintenance
   - Building codes
2. **Property protection** activities are usually undertaken by property owners on a building-by-building or parcel basis.
   - Relocation
   - Acquisition
   - Building elevation
   - Retrofitting
   - Sewer backup protection
   - Insurance
3. **Natural resource protection** activities preserve or restore natural areas or the natural functions of floodplain and watershed areas. They are implemented by a variety of agencies, primarily parks, recreation, or conservation agencies or organizations.
   - Wetlands protection
   - Erosion and sediment control
   - Natural area preservation
   - Natural area restoration
   - Water quality improvement
   - Coastal barrier protection
   - Environmental corridors
   - Natural functions protection
4. **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 or critical facilities.
   - Hazard threat recognition
   - Hazard warning
   - Hazard response operations
   - Critical facilities protection
   - Health and safety maintenance
   - Post-disaster mitigation actions
5. **Structural projects** keep flood waters away from an area with a levee, reservoir, or other flood control measure. They are usually designed by engineers and managed or maintained by public works staff.
   - Reservoirs
   - Levees/floodwalls
   - Diversions
   - Channel modifications
   - Storm drain improvements
6. **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. They are usually implemented by a public information office.
   - Map information
   - Outreach projects
   - Real estate disclosure
   - Library
   - Technical assistance
   - Environmental education

Source: (FEMA 2025)

Figure 1-2. CRS Coordinator's Manual Figure 360-1 Typical Property Protection Measures



Source: (FEMA 2025)

The following section expands on the CRS Activity 510, Repetitive Loss Area Analysis criteria for Category B communities. As of the 2026 RLAA data assessment, the four RLAA participating communities are CRS Category B communities with 49 or fewer RL properties, per FEMA NFIP data (ES Table 1). Step 4 was completed following CRS Manual baseline guidance as mentioned in Figure 1-1 and Figure 1-2. Tetra Tech expanded mitigation actions appropriate to the community's RL areas based on problem statements, structure data, local mitigation efforts, and addressed action items such as property maintenance to grant eligible projects.

In addition to the five-step planning process, the following CRS credit criteria were met:

1. Communities with one or more RL properties on FEMA's RL property list must have at least one RL area delineated in accordance with the CRS Coordinator's Manual.
2. An area analysis must have been prepared and adopted for each RL area in the community. This includes the RL area being mapped; a Category C community must prepare analysis for all of its RL areas if it wants to use RLAA to meet its repetitive loss planning prerequisite.
3. The RLAA report must be submitted to the community's governing body and made available to the media and the public. The complete RLAA report must be adopted by the community's governing body or by an office that has delegated approval authority by the community's governing body.
4. The community must prepare an annual evaluation report for its RLAA.
   - The report must review each action item, describe what was implemented, what was not implemented, and recommend changes to the action items as appropriate.
   - One annual report can cover some or all the area analyses that were prepared.
   - The report must be made available to the media and the public.
   - The report is submitted with the community's annual CRS recertification.
5. The community must update its RLAA in time for each CRS cycle verification visit.
   - The update must review the flooding and building conditions as well as any changes to FEMA's RL list, to determine whether the number of buildings on the list or other circumstances have changed and revise the mapping and action items accordingly.
   - The update can be a new report or an addendum to the existing report.
   - An annual evaluation report that reviews and updates the 5-step process may qualify as the area analysis update.
   - The update can qualify as the annual evaluation report for the year it was prepared.
   - The update must be made available to the media and the public.

- If the repetitive flooding problem has been mitigated, the appropriate documentation must be submitted in order to remove the properties from FEMA's repetitive loss list.
- Any change to an adopted area analysis must be approved following the same process as approval of the original analysis.

2. FLOOD INSURANCE ASSESSMENT

CRS Activity 370- Flood Insurance Assessment has been completed for each CRS RLAA participating community following the 2025 CRS Manual and 370 FIA report template.

Flood insurance data on active policies and historical claims is a valuable source of information on the flood hazards and mitigation needs of a community. Flood insurance is available to property owners within communities that participate in the NFIP and is required as a condition for federal aid and for federally backed mortgages or loans for a building in the FEMA SFHA. This section assesses the flood insurance coverage as per CRS Activity 370 of unincorporated Orange County, the City of Newport Beach, the City of San Juan Capistrano, and the City of Santa Ana—all of which have identified RL areas.

2.1 UNINCORPORATED ORANGE COUNTY FLOOD INSURANCE ASSESSMENT

Unincorporated Orange County (hereafter the County) has been a Regular participant in the NFIP since 9/14/1979 and has participated in the CRS program since 10/1/1991. The County is currently a CRS Class 5 community, which provides policy holders with a 25 percent discount on flood insurance. This section assesses the flood insurance coverage for unincorporated Orange County and provides recommendations for coverage improvements.

2.1.1 Coverage Assessment

The objective of CRS Activity 370 is to improve flood insurance coverage in a community through a three-step process to assess community needs. The first step in the process is to conduct a flood insurance coverage assessment (FIA) to identify a community's current level of coverage and shortcomings. The FIA element provides a maximum credit of 15 points.

Recent NFIP data was evaluated to answer questions about the coverage and areas susceptible to flooding in unincorporated Orange County. All data from this assessment was pulled from FEMA's Community Information System (CIS) on 5/2/2025. It should be noted that the paid claims data for the policies by flood zones and the Pre-FIRM/Post-FIRM policy data from FEMA's CIS do not match the overall Orange County totals. For multi-jurisdictional plans, the totals of the NFIP data set provided commonly do not match. This is based on data pulled at different time frames. The comparison of the claims data for the policies by flood zone and the active policies and claims data for the Pre-FIRM/Post-FIRM structures with the overall Orange County total used the totals listed in Table 2-1 as the denominator to get the percentages. The data was used to assess the following questions:

- Where do active flood insurance policies exist?
- Where have flood insurance claims have been paid in the past?
- How many buildings are exposed to flood hazards verses how many buildings have coverage?
- How does the average amount of coverage compare to the amount of expected flood damage from the 100-year flood?

Table 2-1 reflects NFIP data for unincorporated Orange County by structure type. Unincorporated Orange County has 254 active policies, and 95.7 percent are for residential structures (243). Most of these residential policies are for single-family structures (227). Residential structures also make up most of the paid claims with 359, which is 83.5 percent of the 430 paid claims. Single-family structures have the most paid claims with 323. Unincorporated

Orange County has a total of $3,495,482.98 in paid claims. A total of $2,034,708.98 of the paid claims are for residential structures and most of these are for single-family structures ($1,887,799.88). Non-residential structures make up only 16.5 percent of the paid claims but have 41.8 percent of the total amount of paid claims ($1,460,774).

Table 2-1. Total Unincorporated Orange County NFIP Policy and Claims by Building Occupancy Type

Occupancy	Number of Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Single-Family	227	$220,712	$71,085,000	323	$1,887,799.88
2-4 Family	12	$6,745	$3,044,00	19	$79,658.45
All Other Residential	4	$2,724	$1,847,000	17	$67,250.65
Non-Residential	11	$19,851	$2,572,000	71	$1,460,774.00
Total	**254**	**$250,032**	**$78,548,000**	**430**	**$3,495,482.98**

Source: FEMA Community Information System as of 5/2/2025

Table 2-2 reflects NFIP data for unincorporated Orange County categorized by FEMA flood zone. The data shows that B, C, & X zones have 191 policies which is 75.2 percent of the total policies (254). When looking at the policies in the SFHA, there are 63 active polices located in the SFHA which is 24.8 percent of the total active policies (254). Most of the SFHA policies are located in the A1-30 & AE zones with 51 policies.

Table 2-2. Total Unincorporated Orange County NFIP Policy and Claims by Flood Zone

Flood Zone	Number of Policies	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
SFHA Zones					
A1-30 & AE Zones	51	$84,553	$12,036,000	103	$1,287,695.80
A Zones	7	$5,475	$1,392,000	42	$300,780.80
AO Zones	0	$0	$0	7	$8,929.14
AH Zones	0	$0	$0	4	$155,883.63
A99 Zones	5	$7,331	$994,000	18	$27,017.70
V Zones	0	$0	$0	26	$197,002.63
D Zones	0	$0	$0	1	$2,358.29
B, C, & X Zone					
Standard	191	$152,673	$64,126,000	108	$860,321.30
Preferred	0	$0	$0	83	$585,915.29
Total	**254**	**$250,032**	**$78,548,000**	**392**	**$3,425,904.58**

Source: FEMA Community Information System as of 5/2/2025

When comparing the number of paid claims for unincorporated Orange County (430) to the paid claims based on flood zone, the paid claims are nearly equally split between the SFHA (201) and the B, C, & X zone (191). This represents 46.7 percent (SFHA) and 44.4 percent (B, C, & X zones) of the total number of claims paid, respectively. Most of the paid claims in the SFHA are in the A1-30 & AE zones with 103. Policies in the SFHA have the highest number of paid claims with $1,979,667.99 while the B, C, & X zones have $1,446,236.59.

Table 2-3 reflects NFIP data for the pre-FIRM structures for unincorporated Orange County. For unincorporated Orange County, pre-FIRM structures are structures built before 9/14/1979. Unincorporated Orange County has 152 active policies for pre-FIRM structures. Pre-FIRM structures make up 59.8 percent of the total active policies in unincorporated Orange County (254). When looking at the flood zones, most of the active pre-FIRM policies are in the B, C, & X zones with 103 which is 67.8 percent of the active pre-FIRM policies (152). There are 49 active pre-FIRM policies located in the SFHA which is 32.2 percent of the active pre-FIRM policies and most of these are in the A1-30 & AE zones (40).

Table 2-3. Unincorporated Orange County NFIP Policy and Claim Data for Pre-FIRM Structures

Flood Zone	Number of Policies	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
SFHA Zones					
A1-30 & AE Zones	40	$75,017	$9,115,000	101	$1,287,695.80
A Zones	6	$5,265	$1,377,000	38	$298,264.45
AO Zones	0	$0	$0	6	$6,570.15
AH Zones	0	$0	$0	4	$155,883.63
A99 Zones	3	$1,151	$244,000	15	$22,899.17
V Zones	0	$0	$0	25	$197,002.63
D Zones	0	$0	$0	1	$2,358.29
B, C, & X Zone					
Standard	103	$83,049	$34,496,000	87	$342,080.40
Preferred	0	$0	$0	48	$406,638.17
Total	**152**	**$164,482**	**$45,232,000**	**325**	**$2,719,392.69**

Source: FEMA Community Information System as of 5/2/2025

Pre-FIRM policies have a total of 325 paid claims which is 75.6 percent of the total paid claims for unincorporated Orange County (430). When looking at the flood zones, the pre-FIRM policies located in the SFHA have 190 paid claims which is 58.5 percent of the paid claims for pre-FIRM policies (325). Most of the SFHA pre-FIRM policies are in the A1-30 & AE zones with 101. The pre-FIRM policies located in the B, C, & X zones have 135 paid claims, which is 41.5 percent of the total pre-FIRM paid claims (325). The number of paid claims for the pre-FIRM policies is $2,719,392.98 of which $1,970,674.12 is for SFHA pre-FIRM policies and $748,718.57 is for B, C, & X zones pre-FIRM policies.

Table 2-4 reflects the number of policies for post-FIRM structures in unincorporated Orange County. For unincorporated Orange County, post-FIRM structures are structures built after 9/14/1979. Unincorporated Orange County has 101 active policies for post-FIRM structures, which make up 39.8 percent of all the total active policies for unincorporated Orange County (254). When looking at the flood zones, most of the active post-FIRM policies are for structures located in the B, C, & X zones with 87 policies. This is 86.1 percent of the total post-FIRM policies (101). There are 14 active post-FIRM policies located in the SFHA, which make up 13.9 percent of the total active post-FIRM policies (101). Most of the SFHA post-FIRM policies are in the A1-30 & AE Zones with 11 active policies.

Post-FIRM policies have a total of 67 paid claims which is 15.6 percent of the total paid claims for unincorporated Orange County (430). When looking at the flood zones, the policies located in the B, C, & X zones have the most, with 56 claims which is 83.6 percent of the total post-FIRM claims (67). The SFHA policies have 11 claims which is 16.4 percent of the total post-FIRM claims. The amount of post-FIRM claims is $705,511.89 of which most are for policies located in the B, C, & X zones with $697,518.02. The post-FIRM policies in the SFHA have a total of $8,993.87 in paid claims.

Table 2-4. Unincorporated Orange County NFIP Policy and Claim Data for Post-FIRM Structures

Flood Zone	Number of Policies	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
SFHA Zones					
A1-30 & AE Zones	11	$10,023	$2,921,000	2	$0.00
A Zones	1	$210	$15,000	4	$2,516.35
AO Zones	0	$0	$0	1	$2,358.99
AH Zones	0	$0	$0	0	$0.00
A99 Zones	2	$6,180	$750,000	3	$4,118.53
V Zones	0	$0	$0	1	$0.00
D Zones	0	$0	$0	0	$0.00
B, C, & X Zone					
Standard	87	$70,318	$29,530,000	21	$518,240.90
Preferred	0	$0	$0	35	$179,277.12
Total	**101**	**$86,731**	**$33,216,000**	**67**	**$706,511.89**

Source: FEMA Community Information System as of 5/2/2025

Table 2-5 shows the repetitive loss properties for unincorporated Orange County by flood zone. The county has a total of 37 repetitive loss properties. Most of these are in the SFHA with 30 repetitive loss properties which is 81.1 percent of the total repetitive loss properties. Among the SFHA zones, the AE, A1-30, AO, AH, and A zones have 28 repetitive loss properties. Only 1 repetitive loss property is insured and is located in the B, C, and X zone. Repetitive loss properties in unincorporated Orange County have 81 paid claims and most of these are for properties located in the SFHA with 65 which is 80.3 percent of the total repetitive loss property claims. Among the SFHA zones, the AE, A1-30, AO, AH, and A zones have 61 claims. There are 16 claims for repetitive loss properties located in the B, C, and X zones and 4 of these claims are for the insured repetitive loss property.

Table 2-5. Unincorporated Orange County Repetitive Loss Data by Flood Zone

RL Buildings, Losses, and Payments	AE, A1-30, AO, AH, A	VE, V1-30, V	B, C, X	Total
RL Buildings (Total)	28	2	7	**37**
RL Buildings (Insured)	0	0	1	**1**
RL Losses (Total)	61	4	16	**81**
RL Losses (Insured)	0	0	4	**4**
RL Payments (Total)	$1,236,366.90	$54,863.27	$551,746.01	**$1,842,976.18**
Building	$962,577.72	$50,913.37	$485,810.07	**$1,499,301.16**
Contents	$273,789.18	$3,949.90	$65,935.94	**$343,675.02**
RL Payments (Insured)	$0.00	$0.00	$358,906.34	**$358,906.34**
Building	$0.00	$0.00	$314,540.70	**$314,540.70**
Contents	$0.00	$0.00	$44,365.64	**$44,365.64**

Source: FEMA Community Information System as of 5/2/2025

The amount of repetitive loss payments for unincorporated Orange County is $1,842,976.18. Most of this amount is for repetitive loss properties located in the SFHA with $1,291,230.17 with the AE, A1-A30, AO, AH, and A zones having $1,236,366.90 in repetitive loss payments. Payments for repetitive loss claims can be divided into whether the payments are for the building or for the contents. The repetitive loss building payments for unincorporated Orange County is $1,499,301.16 with most of this for repetitive loss properties located in the SFHA with an amount of $1,013,491.09. The AE, A1-A30, AO, AH, and A zones have $962,577.72 in building payments. The contents payments for the repetitive loss properties for unincorporated Orange County are $343,675.02 with most of these payments for repetitive loss properties in the SFHA with an amount of

$277,739.08. For the SFHA zones, the AE, A1-A30, AO, AH, and A zones have $273,789.18 in contents payments.

The amount of payments for insured repetitive loss properties is $358,906.34 and is for the repetitive loss property located in the B, C, and X zones. The amount is split between $314,540.70 for building payments and $44,365.64 for contents payments.

2.1.2 Level of Flood Insurance Coverage

Table 2-6 compares the number of active policies in the SFHA to the number of buildings located in the SFHA. The data on the number of active policies in the SFHA was collected from FEMA's Community Information System and the number of buildings located in the SFHA was determined in the 2026 Orange County Floodplain Management Plan. Unincorporated Orange County has a total of 63 active policies in the SFHA and 159 buildings in the SFHA. The insurance coverage rate for buildings in the SFHA is 39.6 percent.

Table 2-6. Percent of Unincorporated Orange County Buildings Insured in the SFHA

Flood Zone	Number of Policies in Force	Number of Buildings	% Insured
SFHA	63	159	39.6%

Source: FEMA Community Information System as of 5/2/2025; 2026 Orange County Floodplain Management Plan

2.1.3 Conclusions

The following conclusions can be drawn from the flood insurance and building data reported above for unincorporated Orange County:

- Single-family homes represent a dominant 89 percent of all current flood insurance policies in force yet, account for only 75 percent of the total paid claims. This discrepancy suggests a relatively lower claim rate amount for single-family homes—or higher claim frequency among other property types, warranting further investigation into the building type vulnerabilities.
- 75 percent of current policies in force are held by structures in FEMA designated lower-risk (B, C, X) flood zones. Yet, the paid claims are nearly evenly distributed between, with 46.7 percent occurring in the high-risk SFHA and 44.4 percent in zones B, C, and X. This signals residual flood risk outside the formally mapped high-risk areas.
- Pre-FIRM buildings (built before the adoption of the Flood Insurance Rate Map) account for 59.8 percent of the current policies, but are associated with 75.6 percent of total claims in unincorporated Orange County. 67.8 percent of these policies are for properties in the B, C, and X flood zones, while 32.2 percent are located in the SFHA. Despite this, 58.8 percent of the pre-FIRM claims come from SFHA properties, and 41.5 percent from the B, C, and X flood zones highlighting that legacy construction leaves homes vulnerable across all zones.
- Post-FIRM buildings account for 39.8 percent of the total current policies, yet account for only 15.6 percent of all paid claims demonstrating the effectiveness of modern building standards and compliance measures. When breaking down by flood zone, a vast majority (86.1 percent) of these are in the B, C, and X flood zones while only 13.4 percent are located in the SFHA. Importantly 83.6 percent of post-FIRM claims occurred in the B, C, and X flood zones suggesting that even new structures in supposedly lower-risk areas remain vulnerable.

- Unincorporated Orange County has 37 repetitive loss buildings with a majority of them located in the SFHA (81.1 percent). Only one of the repetitive loss buildings is currenlty insured and it is located in the B, C, and X zones.
- About 40 percent of the buildings located in the SFHA have flood insurance.

2.1.4 Recommendations

The following recommendations are intended to support the improved flood insurance coverage for the Unincorporated Orange County:

- Implement targeted outreach campaigns for post-FIRM and non-residential structure owners. Develop and deploy an education and outreach strategy focused on owners of post-FIRM buildings and non-residential structures, many of whom may underestimate their risk due to improved construction standards or commercial priorities.
- Promote flood mitigation education and incentives for pre-FIRM and single-family homeowners. Launch a comprehensive mitigation education initiative targeting pre-FIRM and single-family homeowners, who are statistically more vulnerable and represent the majority of the flood-related claims.
- Increase awareness and understanding of flood insurance in SFHA communities. Conduct proactive engagement in SFHAs to raise awareness about the necessity, available, and limitation of flood insurance.

2.1.5 Submit to Governing Body

The assessment document (containing only general or aggregate data or maps) must be submitted to the community's governing body for CRS purposes. No action is needed by the governing body for a standalone FIA report. The objective is to inform the elected leaders about flood insurance coverage. Elected leaders may opt to take the steps, which is to prepare a plan to improve coverage.

2.1.6 Reassessment

Updated flood insurance data must be obtained five years after the assessment is done. The new information is used to update the level coverage and the recommendations. This document is revised accordingly and submitted to the community's governing body to maintain CRS credit criteria. No action is needed by the governing body.

2.2 CITY OF NEWPORT BEACH FLOOD INSURANCE ASSESSMENT

The City of Newport Beach (hereafter the City) has been a Regular participant in the NFIP since 9/1/1978 and has participated in the CRS program since 10/1/1993. The City is currently a CRS Class 6 community, which provides policy holders with a 20 percent discount on NFIP flood insurance. This section assesses the flood insurance coverage for the City of Newport Beach and provides recommendations for coverage improvements.

2.2.1 Coverage Assessment

The objective of CRS Activity 370 is to improve flood insurance coverage in a community through a three-step process to assess community needs. The first step in the process is to conduct a flood insurance coverage

assessment (FIA) to identify a community's current level of coverage and shortcomings. The FIA element provides a maximum credit of 15 points.

Recent NFIP data was evaluated to answer questions about coverage and areas susceptible to flooding in the City. All data from this assessment was pulled from FEMA's Community Information System (CIS) on 5/2/2025. It should be noted that the paid claims data for the policies by flood zones and the Pre-FIRM/Post-FIRM policy data from FEMA's CIS do not match the overall Orange County totals. For multi-jurisdictional plans, the totals of the NFIP data set provided commonly do not match. This is based on data pulled at different time frames. The comparison of the number of active policies, number of claims, and the number of claims in the flood zones and pre-FIRM/post-FIRM with the overall totals used totals listed in Table 2-7 as the denominator to get the percentages. The data was used to assess the following questions:

- Where do active flood insurance policies exist?
- Where have flood insurance claims been paid in the past?
- How many buildings are exposed to the flood hazard versus how many buildings have coverage?
- How does the average amount of coverage compare to the amount of expected flood damage from 100-year flood?

Table 2-7. Total Newport Beach NFIP Policy and Claims Data by Building Occupancy Type

Occupancy	Number of Policies	Total Premium	Insurance in Force	Number of Paid Losses	Total of Closed Paid Losses
Single-Family	782	$641,333	$260,929,000	202	$983,396.10
2-4 Family	211	$178,784	$65,464,000	68	$265,976.86
All Other Residential	96	$38,610	$26,331,000	7	$0.00
Non-Residential	42	$97,023	$22,669,000	11	$524,240.76
Total	**1,131**	**$955,750**	**$375,393,000**	**288**	**$1,773,613.72**

Source: FEMA Community Information System as of 5/2/2025

Table 2-7 reflects NFIP data for the City by structure type. Residential structures make up most of the active policies in the City: 1,089, or 96.3 percent of the total policies. Single-family structures make up most of the policies with 782 (69.1 percent) policies. Residential structures also make up most of the paid claims with 277, which is 96.2 percent of the total paid claims. Single-family structures also make up most of the paid claims with 202 paid claims. Residential structure also has the greatest total amount of paid claims with $1,249,372.96 (70 percent) and Single-family has most of these claims (55 percent). Non-residential structures make up a small percentage of the active policies (3.7 percent) and paid claims (3.8 percent), but the total amount of paid claims is $524,240.76 which is 26.9 percent of the total amount of paid claims.

Table 2-8 reflects data for the City categorized by FEMA flood zones. Most of the active policies are in the B, C, and X Zones with 807 active policies which is 71.4 percent of the total policies (1,131). The properties in the SFHA have 301 active policies. Most of the policies in the SFHA are in the A1-30 & AE Zones (106) and AO (188) contain. For the number of paid claims, the SFHA has 44.8 percent (129) of the total claims (288) and B, C, and X Zones have 54.5 percent (157) of the total claims (288). Many of the claims paid with the SFHA were for structures located in A1-30 & AE Zones (75). B, C, and X Zones have the greatest number of paid claims with $1,433,295.50, while the amount of paid claims for the SFHA is only $318,768.22. Table 2-12 compares the number of active policies in the SFHA to the number of buildings located in the SFHA. Based on a GIS analysis, the current number of buildings mapped within the FEMA SFHA for the City of Newport Beach is 422.

Table 2-8. Total Newport Beach NFIP Policy and Claims Data by Flood Zone

Flood Zone	Number of Policies in Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
SFHA Zones					
A1-30 & AE Zones	106	$92,785	$32,794,000	75	$158,572.78
A Zones	3	$5,334	$789,000	11	$24,265.73
AO Zones	188	$169,257	$51,283,000	2	$0.00
AH Zones	0	$0	$0	0	$0.00
A99 Zones	0	$0	$0	40	$135,929.71
V1-30 & VE Zones	4	$5,845	$1,009,000	0	$0.00
V Zones	0	$0	$0	1	$0.00
B, C, & X Zones					
Standard	807	$669,417	$282,720,000	87	$965,754.20
Preferred	0	$0	$0	70	$467,541.30
Total	**1,108**	**$942,638**	**$368,595,000**	**286**	**$1,752,063.72**

Source: FEMA Community Information System as of 5/2/2025

Table 2-9. Newport Beach Repetitive Loss Data by Flood Zone

RL Buildings, Losses, and Payments	AE, A1-30, AO, AH, A	VE, V1-30, V	B, C, X	Total
RL Buildings (Total)	7	0	14	**21**
RL Buildings (Insured)	0	0	0	**0**
RL Losses (Total)	14	0	24	**38**
RL Losses (Insured)	0	0	0	**0**
RL Payments (Total)	$86,144.41	$0.00	$668,298.58	**$754,442.99**
Buildings	$82,497.30	$0.00	$577,380.95	**$659,878.25**
Contents	$3,647.11	$0.00	$90,917.63	**$94,564.74**
RL Payments (Insured)	$0.00	$0.00	$0.00	**$0.00**
Buildings	$0.00	$0.00	$0.00	**$0.00**
Contents	$0.00	$0.00	$0.00	**$0.00**

Source: FEMA Community Information System as of 5/2/2025

Table 2-10 reflects NFIP data by flood zone for pre-FIRM structures. For the City of Newport Beach, pre-FIRM structures are those built before 9/1/1978. The City has 674 pre-FIRM active policies which are 59.6 percent of the total for the city (1,131). Most of the active policies for the pre-FIRM structures are in the B, C, and X Zones with 452 which is 67.1 percent of the total (674). There are 222 active policies for pre-FIRM structures in the SFHA which is 32.9 percent of the total active pre-FIRM structure policies (674). There are nearly equal numbers of paid claims for structures in the SFHA (121) and the non-SFHA B, C, and X Zones (124). However, the greatest amount of paid claims are for pre-FIRM structures located in the B, C, and X Zones with $1,135,121.95, which is 80.0 percent of all paid pre-FIRM claims ($1,419,439.44).

Table 2-10. Newport Beach NFIP Policy and Claim Data for Pre-FIRM Structures

Flood Zone	Number of Policies in Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
SFHA Zones					
A1-30 & AE Zones	48	$30,395	$12,768,000	72	$156,099.14
A Zones	3	$5,334	$789,000	11	$24,265.73
AO Zones	168	$145,955	$44,712,000	1	$0.00
AH Zones	0	$0	$0	0	$0.00
A99 Zones	0	$0	$0	36	$103,952.62
V1-30 & VE Zones	3	$3,387	$759,000	0	$0.00
V Zones	0	$0	$0	1	$0.00
B, C, & X Zones					
Standard	452	$372,442	$158,702,000	73	$831,903.87
Preferred	0	$0	$0	51	$303,218.08
Total	**674**	**$557,513**	**$217,730,000**	**245**	**$1,419,439.44**

Source: FEMA Community Information System as of 5/2/2025

Table 2-11 reflects the NFIP policy and claims data by flood zone for post-FIRM structures. For the City of Newport Beach, post-FIRM structures are structures that were built after 9/1/1978. The City has a total of 428 active policies for post-FIRM structures, which is 37.8 percent of the total active policies for the City (1,131). Most of the post-FIRM policies are in the B, C, and X Zones with 350, which is 81.8 percent of the total active post-FIRM policies (428). The SFHA has a total of 78 actives policies which is 18.2 percent of the total active post-FIRM policies (428). There are 41 paid claims for the post-FIRM policies and 33 of these claims are for policies located in the B, C, and X Zones which represent 80.5 percent of the total paid claims for post-FIRM policies (41). The SFHA has eight paid claims, which is 19.5 percent of the total paid post-FIRM claims. The amount of claims paid for post-FIRM policies is $332,624.29 and most of this amount is for the policies located in the B, C, and X Zones ($298,173.55).

Table 2-11. Newport Beach NFIP Policy and Claim Data for Post-FIRM Structures

Flood Zone	Number of Policies in Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
SFHA Zones					
A1-30 & AE Zones	57	$60,995	$19,676,000	3	$2,473.64
A Zones	0	$0	$0	0	$0.00
AO Zones	20	$23,302	$6,571,000	1	$0.00
AH Zones	0	$0	$0	0	$0.00
A99 Zones	0	$0	$0	4	$31,977.09
V1-30 & VE Zones	1	$2,325	$250,000	0	$0.00
V Zones	0	$0	$0	0	$0.00
B, C, & X Zones					
Standard	350	$294,355	$122,215,000	14	$133,850.33
Preferred	0	$0	$0	19	$164,323.22

Flood Zone	Number of Policies in Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
Total	**428**	**$380,977**	**$148,712,000**	**41**	**$332,646.28**

Source: FEMA Community Information System as of 5/2/2025

Error! Reference source not found. reflect the repetitive loss properties for the City by flood zone. The City has a total of 21 repetitive loss structures with most of them located in the B, C, and X Zones (14). The number of repetitive loss claims is 38 with 63.2 percent of them being structures located in the B, C, and X Zones. The total repetitive loss payments for the City are $754,442.99 with 87.4 percent in building payments and 12.5 percent in contents payments. B, C, and X Zone have the greatest amount of repetitive loss payments: 88.6 percent of the total payments, compared to 11.4 percent of total payments in the SFHA zone.

2.2.2 Level of Flood Insurance Coverage

Table 2-12 shows the percent of Newport Beach buildngs insured in the SFHA. There are 301 policies for structures located in the SFHA. When comparing this coverage to the total number of structures located in the SFHA (422). 71.3 percent of the structures in the SFHA have flood insurance.

Table 2-12. Percent of Newport Beach Buildings Insured in the SFHA

Flood Zone	Number of Policies in Force	Number of Buildings	% Insured
SFHA	301	422	71.3%

Source: FEMA Community Information System as of 5/2/2025; 2026 Orange County Floodplain Management Plan

2.2.3 Conclusions

The following conclusions can be drawn from the flood insurance and building data reported above:

- Residential structures represent most of the active policies (96.3 percent) and the paid claims (70 percent) within the City. Among these, single-family homes account for the largest share of both metrics, highlighting their central role in community's insured building stock and flood loss history.
- While non-residential properties represent a small fraction of both active policies (3.7 percent) and paid claims (3.8 percent), they contribute disproportionately to total paid losses, accounting for nearly 30 percent of all claim payments.
- Most of the active NFIP policies in the City are located outside of the SFHA in the B, C, and X Zones (71.4 percent).
- Paid flood insurance claims are almost evenly split between the SFHA (44.8 percent) and the B, C, and X Zones (54.5 percent). However, the highest total dollar amount of paid claims is associated with structures in the B, C, and X Zones indicating substantial loss exposure even outside the high-risk flood zones.
- Many active pre-FIRM policies are for structures located in the B, C, and X Zones. Claims associated with pre-FIRM structures are nearly evenly distributed between the SFHA and lower risk zones (B, C, and X), further illustrating that aging structures in all mapped flood zones contribute to overall community vulnerability.

- Among the active pre-FIRM policies, the highest total paid claims are attributed to structures in the B, C, and X Zones. This trend may reflect both the high number of policies in these zones and potential underestimation of flood risk in areas not traditionally viewed as high hazard.
- Most post-FIRM active policies and associated paid claims also fall within the B, C, and X Zones. This pattern indicates that even newer buildings constructed under regulated floodplain standards remain vulnerable in these areas.
- As with pre-FIRM structures, post-FIRM policies in the B, C, and X Zones account for the greatest total amount of paid claims. This fact emphasizes that structural age alone does not dictate risk; location and construction remain key factors.
- Of the 21 repetitive loss structures identified in the City, most are situated in the B, C, and X Zones (58.3 percent). This clustering suggests that repetitive losses are not confined to SFHA areas and that certain lower-risk zones may contain localized flood-prone features not captured in the FEMA's flood maps.
- The City has experienced a total of $754,442.99 in repetitive loss payments, with $668,298.58 (approximately 89 percent) attributed to RL structures in the B, C, and X Zones. This reinforces the need for targeted mitigation strategies in so-called moderate- and low-risk areas where recurring flood losses continue to occur.
- The City has a flood insurance coverage rate of 71.3 percent for structures located in the SFHA.

2.2.4 Recommendations

The following recommendations are intended to support the improved flood insurance coverage for the City of Newport Beach:

- Implement a comprehensive public education campaign to raise awareness of the value of flood insurance and practical flood mitigation strategies. This outreach should clarify common misconceptions, such as the belief that flood insurance is only necessary for properties within the SFHA.
- Prioritize education and engagement efforts for populations and structures with the highest exposure or history of losses, include:
  - Non-residential Property Owners: These properties, though fewer in number, account for a disproportionate share of paid claims.
  - Owners of Pre-FIRM and Older Structures: These buildings are typically more vulnerable to flooding.
  - Structures Located Outside the SFHA: Given the high number and severity of claims from Zones B, C, and X, develop specialized messaging for those areas.

2.2.5 Submit to Governing Body

The assessment document (containing only general or aggregate data or maps) must be submitted to the community's governing body for CRS purposes. No actions are needed by the governing body for a stand-alone FIA report. The objective is to inform the elected leaders about flood insurance coverage. They may opt to take the step, which is to prepare a plan to improve coverage.

2.2.6 Reassessment

Updated flood insurance data must be obtained five years after the assessment is done. The new information is used to update the level of coverage and the recommendations. The document is revised accordingly to maintain CRS credit criteria and shared to the community's governing body. No action is needed by the governing body.

2.3 CITY OF SAN JUAN CAPISTRANO FLOOD INSURANCE ASSESSMENT

The City of San Juan Capistrano (hereafter the City) has been a Regular participant in the NFIP since 9/14/1979 and has participated in the CRS program since 10/1/1991. The City is currently a CRS Class 8 community, which provides policy holders with a 10 percent discount on NFIP flood insurance. This section assesses the flood insurance coverage for the City of San Juan Capistrano and provides recommendations for coverage improvements.

2.3.1 Coverage Assessment

The objective of CRS Activity 370 is to improve flood insurance coverage in a community through a three-step process to assess community needs. The first step in the process is to conduct a flood insurance coverage assessment (FIA) to identify a community's current level of coverage and shortcomings. The FIA element provides a maximum credit of 15 points.

Recent NFIP data was evaluated to answer questions about coverage and areas susceptible to flooding in the City. All data from this assessment was pulled from FEMA's Community Information System (CIS) on 5/2/2025. It should be noted that the paid claims data for the policies by flood zones and the Pre-FIRM/Post-FIRM policy data from FEMA's CIS do not match the overall Orange County totals. For multi-jurisdictional plans, the totals of the NFIP data set provided commonly do not match. This is based on data pulled at different time frames. The comparison of the number of active policies, number of claims, and the amount of claims in the flood zones and pre-FIRM/post-FIRM with the overall City totals used the totals listed in Table 2-13 as the denominator to get the percentages. The data was used to assess the following questions:

- Where do active flood insurance policies exist?
- Where have flood insurance claims have been paid in the past?
- How many buildings are exposed to the flood hazard versus how many buildings have coverage?
- How does the average amount of coverage compare to the amount of expected flood damage from the 100-year flood?

Table 2-13. Total San Juan Capistrano NFIP Policy and Claims Data by Building Occupancy Type

Occupancy	Number of Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Single-Family	126	$126,960	$34,454,000	24	$98,095.57
2-4 Family	2	$1,143	$498,000	3	$51,097.85
All Other Residential	5	$4,175	$1,304,000	0	$0.00
Non-Residential	28	$104,409	$13,415,000	6	$38,346.57
Total	**161**	**$236,687**	**$49,671,000**	**33**	**$187,539.99**

Source: FEMA Community Information System as of 5/2/2025

Table 2-13 reflects NFIP policy and claims data for the City categorized by structure type. Residential structures make up 82.6 percent of the number of active policies and single-family structures make up most of these residential structures (78.3 percent). When looking at the paid claims, residential structures account for 81.8 percent of the total paid claims. Single-family structures have the greatest number of claims with 24, which is 72.7 percent of the total number of paid claims. Residential structures also have the greatest dollar amount of paid losses with $149,193.42 which 79.6 percent of the total amount of paid claims. With the residential structure

category, single-family structures account for 52.3 percent in total dollar amount of paid claims and multi-family structures account for 27.2 percent in total dollar amount of paid claims. Non-residential structure accounts for 20.4 percent of the total dollar amount of paid claims.

Although the active policies for multi-family structures make up 1.2 percent and active policies for non-residential structures make up 3.1 percent, which is a small percentage of the number of active policies, they represent 47.7 percent of the total amount of paid claims with the multi-family structures accounting for 27.3 percent and non-residential structures account for 20.4 percent of the total amount of paid claims.

Table 2-14 reflects the policy and claims data for the City categorized by flood zones. The active policies for the City are nearly equally split between the SFHA (74) and B, C, and X Zones (77). When looking at the different SFHA flood zones, the AO Zones have 26.7 percent of the active policies (161), the A1-30 and AE Zones have 18.0 percent of the active policies (161), and the A Zones have 1.2 percent of the active policies (161). The number of paid claims is nearly equally split between the SFHA (15) and B, C, and X Zones (17). The A1-30 & AE Zones have the highest number of SFHA paid claims. While the number of paid claims is nearly equal, the SFHA has the greatest dollar amount of paid claims with $143,721.06, which $110,586.07 of this is for policies located in the A1-30 & AE Zones.

Table 2-14. Total San Juan Capistrano NFIP Policy and Claims Data by Flood Zone

Flood Zone	Number of Policies In Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
SFHA Zones					
A1-30 & AE Zones	29	$74,037	$10,382,000	11	$110,586.07
A Zones	2	$5,779	$500,000	1	$563.59
AO Zones	43	$81,212	$10,690,000	3	$32,571.40
AH Zones	0	$0	$0	0	$0
B, C, & X Zones					
Standard	77	$71,227	$25,994,000	5	$4,743.05
Preferred	0	$0	$0	12	$39,075.88
Total	**151**	**$232,255**	**$47,566,000**	**32**	**$187,539.99**

Source: FEMA Community Information System as of 5/2/2025

Table 2-15 reflects the NFIP policy and claims data by flood zone for pre-FIRM structures. For the City of San Juan Capistrano, pre-FIRM structures are structures built before 9/14/1979. The City has 73 active pre-FIRM policies which is 45.3 percent of the total active policies (161) for the City. SFHA has the most active policies for pre-FIRM structures with 40, which is 54.8 percent of the pre-FIRM active policies (73). When looking at the different SFHA zones, the AO Zones have 28.8 percent of the active pre-FIRM policies (73), the A1-30 & AE Zones have 23.3 percent of the active pre-FIRM policies (73), and the A Zones have 2.7 percent of the active pre-FIRM policies. The SFHA also has the greatest number of paid claims with 13, which is 72.2 percent of the total pre-FIRM claims (18). The majority of the SFHA claims are for structures located in the A1-30 & AE Zones (11), which make up 61.1 percent of the total pre-FIRM claims (18). The SFHA also has the greatest dollar amount of paid claims at $111,149.66, which account for 91.6 percent of all paid pre-FIRM claims ($121,269.55). The A1-30 & AE Zones has the highest amount of paid claims for the SFHA flood zones with a total of $110,586.07, which is 91.2 percent of the total paid claims for the pre-FIRM policies ($121,269.55).

Table 2-15. San Juan Capistrano NFIP Policy and Claim Data for Pre-FIRM Structures

Flood Zone	Number of Policies In Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
SFHA Zones					
A1-30 & AE Zones	17	$44,498	$5,091,000	11	$110,586.07
A Zones	2	$5,779	$500,000	1	$563.59
AO Zones	21	$33,294	$4,436,000	1	$0.00
AH Zones	0	$0	$0	0	$0.00
B, C, & X Zones					
Standard	33	$31,271	$11,213,000	3	$1,043.54
Preferred	0	$0	$0	2	$9,076.35
Total	**73**	**$114,842**	**$21,240,000**	**18**	**$121,269.55**

Source: FEMA Community Information System as of 5/2/2025

Table 2-16 reflects the NFIP policy and claims data by flood zone for post-FIRM structures. For the City of San Juan Capistrano, post-FIRM structures are structures built after 9/14/1979. The City has a total of 77 active policies for post-FIRM structures which is 47.8 percent of the total active policies (161) for the City. B, C, and X Zones have the most active policies with 44, which is 57.1 percent of the total active post-FIRM policies (77). The SFHA has 33 policies, which is 42.9 percent of the total active post-FIRM policies (77). There are 14 paid claims for post-FIRM structures, with 85.7 percent of these claims located in the B, C, and X Zones (12). Even though there are more claims in the non-SFHA zones, the dollar amount of paid losses is nearly equally split between the SFHA Zones and B, C, and X Zones, with 49.1 percent in the SFHA ($32,571.40) and 50.8 percent in the B, C, and X Zones ($33,270.44).

Table 2-16. San Juan Capistrano NFIP Policy and Claim Data for Post-FIRM Structures

Flood Zone	Number of Policies In Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
SFHA Zones					
A1-30 & AE Zones	12	$29,539	$5,291,000	0	$0.00
A Zones	0	$0	$0	0	$0.00
AO Zones	21	$45,538	$5,754,000	2	$32,571.40
AH Zones	0	$0	$0	0	$0.00
B, C, & X Zones					
Standard	44	$40,375	$14,781,000	2	$3,699.51
Preferred	0	$0	$0	10	$29,999.53
Total	**77**	**$115,452**	**$25,826,000**	**14**	**$66,270.44**

Source: FEMA Community Information System as of 5/2/2025

Table 2-17 reflect the repetitive loss (RL) properties for the City by flood zone. There is only one RL property in the City with two paid claims and that property is in the B, C, and X Zone. The total RL payments for that one property is $25,268.96, 90.1 percent of this amount is for buildings payments and 9.9 percent is for contents payments.

Table 2-17. San Juan Capistrano Repetitive Loss Data by Flood Zone

RL Buildings, Losses, and Payments	AE, A1-30, AO, AH, A	VE, V1-30, V	B, C, X	Total
RL Buildings (Total)	0	0	1	**1**
RL Buildings (Insured)	0	0	1	**1**

RL Buildings, Losses, and Payments	AE, A1-30, AO, AH, A	VE, V1-30, V	B, C, X	Total
RL Losses (Total)	0	0	2	**2**
RL Losses (Insured)	0	0	2	**2**
RL Payments (Total)	$0.00	$0.00	$25,268.96	**$25,268.96**
Buildings	$0.00	$0.00	$22,779.33	**$22,779.33**
Contents	$0.00	$0.00	$2,489.63	**$2,489.63**
RL Payments (Insured)	$0.00	$0.00	$25,268.96	**$25,268.96**
Buildings	$0.00	$0.00	$22,779.33	**$22,779.33**
Contents	$0.00	$0.00	$2,489.63	**$2,489.63**

Source: FEMA Community Information System as of 5/2/2025

2.3.2 Level of Flood Insurance Coverage

Table 2-18 compares the number of active policies in the SFHA to the number of buildings located in the SFHA. Based on a GIS analysis, the current number of buildings mapped within the SFHA for the City of San Juan Capistrano is 151. Table 2-14 shows the breakdown of the flood insurance policies by FEMA flood zones and there are 151 policies for structures located in the SFHA. When comparing this coverage to the total number of structures located in the SFHA (411), 36.7 percent of the structures in the SFHA have flood insurance.

Table 2-18. Percent of San Juan Capistrano Buildings Insured in the SFHA

Flood Zone	Number of Policies In Force	Number of Buildings	% Insured
SFHA	151	411	36.7%

Source: FEMA Community Information System as of 5/2/2025; 2026 Orange County Floodplain Management Plan

2.3.3 Conclusions

The following conclusions can be drawn from the flood insurance and building data reported above:

- Residential structures account for the majority of the active NFIP policies and paid claims in the city. Within the residential structure group, single-family homes play a central role in both the insured role and flood loss experience of the community.
- Although the active policies for multi-family structures (1.2 percent) and non-residential structures (3.1 percent) represent a small percentage of the active policies and paid claims, they are responsible for a disproportionately high share, 47.7 percent, of the total dollar of paid claims. This suggests significantly higher average loss severity per claim in these property types, potentially due to building complexity, contents value, or usage.
- The distribution of both active policies and paid claims is nearly balanced by structures located in the SFHA and those in the moderate to low risk B, C, and X Zones. This parity indicates that substantial risk – and subsequent insurance participation – exists across all mapped flood zones within the city.
- Despite an equal distribution in policy and claim count, the SFHA accounts for the highest cumulative dollar value of paid claims. This is primarily driven by structures in the A1-30 & AE Zones.
- Most active pre-FIRM policies are in the SFHA, and this area also registers the highest number of claims filed for pre-FIRM structures. This aligns with expectations, as older buildings in high-risk flood zones are generally more vulnerable to damage due to outdated construction standards and lack of elevation.
- The highest total value of paid claims for pre-FIRM structures is concentrated with the SFHA. This underscores the critical need for targeted mitigation in older, high-risk areas to reduce future losses.

- Among post-FIRM structures, 57.1 percent of the active policies are in the B, C, and X Zones, with the remaining 42.9 percent in the SFHA. Despite the assumption that newer buildings are better protected, post-FIRM structures in the B, C, and X Zones account for the largest number of paid claims across all zones, highlighting persistent risk even in non-SFHA areas.
- The total dollar value paid claims for post-FIRM structures is nearly evenly divided between the SFHA and the B, C, and X Zones. This balance reinforces that structural age and flood zone alone do not fully predict flood damage potential.
- The City only has one identified RL property, indicating either effective flood mitigation or limited documentation of repeat loss events.
- Only 36.7 percent of the structures in the SFHA have flood insurance.

2.3.4 Recommendations

The following recommendations are intended to support improved flood insurance coverage for the City of San Juan Capistrano:

- Launch a citywide campaign to inform all property owners, regardless of location or structure type, about the critical importance of flood insurance and practical flood mitigation strategies.
- Focus targeted outreach on non-residential property owners and owners of multi-family residential structures, who despite making up a small fraction of total active policies and claims, account for 47.7 percent of total paid losses. This indicates a significant risk concentration with low insurance penetration, requiring dedicated education and support. Include promotion of insurance coverage for contents for multi-family residential structures.
- Share case studies or anonymized examples from within the city how significant claims arose from structures with relatively low participation in the NFIP. These stories can be powerful motivators for non-participating property owners, especially when paired with visuals or cost comparisons between insured and uninsured losses.
- Collaborate with local economic development offices, chambers of commerce, housing authorities, and neighborhood organizations to integrate flood risk education into broader planning efforts. This helps normalize the conversation about risk and resilience as part of property maintenance, business continuity, and housing investment.

2.3.5 Submit to Governing Body

The assessment document (containing only general or aggregated data or maps) must be submitted to the community's governing body for CRS purposes. No action is needed by the governing body for a standalone FIA report. The objective is to inform the elected leaders about flood insurance coverage. They may opt to take the step, which is to prepare a plan to improve coverage.

2.3.6 Reassessment

Updated flood insurance data must be obtained five years after the assessment was done. The new information is used to update the level of coverage and the recommendations. The document is revised accordingly to maintain CRS credit criteria and submitted to the community's governing body. No action is needed by the governing body.

2.4 CITY OF SANTA ANA FLOOD INSURANCE ASSESSMENT

The City of Santa Ana (hereafter the City) has been a Regular participant in the NFIP since 9/14/1979. This section assesses the flood insurance coverage for the City of Santa Ana and provides recommendations for coverage improvements.

2.4.1 Coverage Assessment

The objective of CRS Activity 370 is to improve flood insurance coverage in a community and is a three-step process that allows a community to assess their needs. The first step in the process is to conduct a flood insurance coverage assessment (FIA) to identify a community's current level of coverage and shortcomings. The FIA element provides a maximum credit of 15 points.

Recent NFIP data was evaluated to answer questions about coverage and areas susceptible to flooding in the City of Santa Ana. All data from this assessment was pulled from FEMA's Community Information System on 5/2/2025. It should be noted that the paid claims data for the policies by flood zones and the Pre-FIRM/Post-FIRM policy data from FEMA's CIS do not match the overall Orange County totals. For multi-jurisdictional plans, the totals of the NFIP data set provided commonly do not match. This is based on data pulled at different time frames. The comparison of the number of active policies, number of claims, and the amount of claims in the flood zones and pre-FIRM/post-FIRM with the overall City totals list in Table 2-19 as the denominator to get the percentages. The data was used to assess the following questions:

- Where do active flood insurance policies exist?
- Where have flood insurance claims been paid in the past?
- How many buildings are exposed to the flood hazards versus how many buildings have coverage?
- How does the average amount of coverage compare to the amount of expected flood damage?

Table 2-19. Total Santa Ana NFIP Policy and Claims Data by Building Occupancy Type

Occupancy	Number of Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Single-Family	342	$211,001	$88,296,000	366	$757,477.39
2-4 Family	44	$27,341	$12,101,000	40	$396,264.55
All Other Residential	117	$53,176	$25,315,000	4	$2,061.29
Non-Residential	47	$61,713	$18,363,000	11	$87,283.13
Total	**550**	**$353,231**	**$144,075,000**	**421**	**$1,243,086.36**

Source: FEMA Community Information System as of 5/2/2025

Table 2-19 reflects the policy and claims for the City categorized by structure type. Most of the active policies in the City are for residential structures with 503 active policies, which is 91.5 percent of the active policies in the City (550). Single-family structures make up most of these policies (62.2 percent) and "All Other Residential" structures have the second highest policies (21.3 percent). Residential structures also account for the most paid claims with 410 which is 97.4 percent of the claims paid in the City (421). Single-family structures have 86.9 percent of paid claims. Residential structures also have the greatest dollar amount, 93 percent of all total losses paid. The single-family structures category accounts for 60.9 percent of the dollar amount of paid claims.

Table 2-20 reflects the policy and claims data for the City categorized by flood zones. The SFHA represents the area that will be inundated by the 1 percent annual chance flood and is the area of high risk of flooding. The SFHA is represented as “A” and “V” zones on the FEMA FIRM. The B, C, and X Zones represent areas located outside of the SFHA and include the area inundated by the 0.2 percent annual chance flood and the areas with low to moderate risk of flooding. The D Zone represent areas with possible but undetermined flood hazards because a flood hazard analysis has not been conducted.

Table 2-20. Total Santa Ana NFIP Policy and Claims Data by Flood Zone

Flood Zone	Number of Policies in Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
SFHA Zones					
A1-30 & AE Zones	26	$21,853	$7,697,000	8	$23,599.90
A Zones	132	$79,484	$33,875,000	35	$36,434.69
AO Zones	24	$19,920	$10,134,000	120	$228,814.09
AH Zones	0	$0	$0	0	$0.00
A99	188	$83,437	$38,265,000	156	$778,825.97
D Zones	0	$0	$0	1	$0.00
B, C, & X Zones					
Standard	163	$139,223	$49,796,000	32	$56,324.80
Preferred	0	$0	$0	7	$60,903.45
Total	**533**	**$343,917**	**$139,767,000**	**359**	**$1,184,902.90**

Source: FEMA Community Information System as of 5/2/2025

The SFHA has the greatest number (370) of active policies which is 67.3 percent of the total active policies (550). B, C, and X Zones have 163 active policies which is 29.6 percent of the total active policies (550). Within the SFHA, the A99 Zones have the most active policies which account for 34.2 percent of the active policies (550) and the A Zones have the second highest number of active policies which account for 24 percent of the active policies (550). The SFHA also has the greatest number of paid claims (319), which is 75.8 percent of the total paid claims (421). Within the SFHA, the A99 Zones have the highest number of paid claims with 156 paid claims which is 37.1 percent of the total paid claims (421). The second highest number of paid claims is the AO Zones at 28.5 percent. Conversely, the B, C, and X Zones have 39 paid claims, which is 9.3 percent of the total paid (421). The SFHA also has the greatest dollar amount of paid claims with $1,067,674.65 and the A99 zone 65.7 percent of this amount.

Table 2-21 reflects the NFIP policy and claims data by flood zone for pre-FIRM structures. For the City of Santa Ana, pre-FIRM structures are structures that are built before 9/14/1979. The City has a total of 390 active pre-FIRM policies, which is 70.9 percent of the total active policies for the city (550). The SFHA has the most active pre-FIRM (248) which is 63.6 percent of the total active pre-FIRM policies for pre-FIRM structures in the City (390). Within the SFHA, A Zones have the highest active policies with 111 (28.5 percent) and the A99 Zone has the second highest number of active policies with 107 (27.4 percent). The B, C, and X Zones account for 36.4 percent of the total active pre-FIRM policies (390). The SFHA has the greatest number of paid claims with 307 which is 88.7 percent of the total paid claims for pre-FIRM structures (346). Of all the zones, the A99 Zones has the highest number of paid claims with 148 (42.8 percent) and the AO Zones have the second highest number of paid claims with 116 (33.5 percent). B, C, and X Zones have 38 paid claims, which is 11 percent of the paid claims for pre-FIRM structures (346). Pre-FIRM policies have $1,152,307.24 in paid claims. The SFHA also has the greatest dollar amount of paid claims with $1,044,771.89 which accounts for 90.7 percent of the amount of paid claims. The A99 Zone has the highest individual amount accounting for 65.7 percent. The B, C, and X Zones account for 9.3 percent of the total dollar amount in paid claims.

Table 2-21. Santa Ana NFIP Policy and Claim Data for Pre-FIRM Structures

Flood Zone	Number of Policies in Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
SFHA Zones					
A1-30 & AE Zones	24	$21,133	$7,203,000	8	$23,599.90
A Zones	111	$57,482	$25,112,000	35	$36,434.69
AO Zones	6	$4,304	$1,624,000	116	$228,138.09
AH Zones	0	$0	$0	0	$0.00
A99	107	$59,131	$24,574,000	148	$756,599.21
D Zones	0	$0	$0	1	$0.00
B, C, & X Zones					
Standard	142	$116,042	$43,184,000	31	$46,631.90
Preferred	0	$0	$0	7	$60,903.45
Total	**390**	**$258,092**	**$101,697,000**	**346**	**$1,152,307.24**

Source: FEMA Community Information System as of 5/2/2025

Table 2-22 reflects the NFIP policy and claims information by flood zone for post-FIRM structures. For the City of Santa Ana, post-FIRM structures are structures that were built after 9/14/1979. The City has a total of 141 active policies for post-FIRM structures which is 25.6 percent of the total active policies for the city (550). Most of these active policies are in the SFHA (120), accounting for 85.1 percent of the active post-FIRM policies (141). The A99 Zone has the highest number of active policies for post-FIRM structures. When looking at the number of paid claims, the SFHA also has the greatest number of paid claims for post-FIRM policies with 12 which accounts for 92.3 percent of the total post-FIRM claims (13). The SFHA claims are in the A99 and AO zones. The total amount of paid claims for post-FIRM active policies is $32,595.66. 70.3 percent ($22,902.76) of the amount of post-FIRM claims occur in the SFHA zones while the remaining 29.7 percent ($9,692.90) of the amount are in the B, C, and X Zones.

Table 2-23 reflects the repetitive loss (RL) properties for the City by flood zone. The City has 13 RL properties with 12 of these properties located in the SFHA and 1 property located in the B, C, and X Zones. The City has two insured buildings that are RL, and these are in the SFHA. The City also has 17 RL claims, with 15 located in the SFHA and 2 in the B, C, and X Zones. There are 3 total RL claims for insured structures, and these are in the SFHA. The total RL payments for the City are $139,959.92, of which 89.0 percent are building payments and 11.0 percent are contents payments. Within the SFHA, the total payments for RL properties are $135,929.40 of which 88.7 percent are building payments and 11.3 percent are contents payments. For the non-SFHA, the total payments for RL properties are only for building payments ($4,030.52) which account for only 2.9 percent of the total RL payments. The total RL payments for the insured buildings in the SFHA are $41,209.11 and there are no RL payments for insured buildings in the non-SFHA zones. The building payments for the insured buildings account for 91.8 percent and the contents payments account for 8.2 percent.

Table 2-22. Santa Ana NFIP Policy and Claim Data for Post-FIRM Structures

Flood Zone	Number of Policies in Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
SFHA Zones					
A1-30 & AE Zones	2	$720	$494,000	0	$0.00
A Zones	21	$22,002	$8,763,000	0	$0.00
AO Zones	18	$15,620	$8,526,000	4	$676.00
AH Zones	0	$0	$0	0	$0.00
A99	79	$23,415	$13,226,000	8	$22,226.76
D Zones	0	$0	$0	0	$0.00
B, C, & X Zones					
Standard	21	$23,309	$6,612,000	1	$9,692.90
Preferred	0	$0	$0	0	$0.00
Total	**141**	**$85,066**	**$37,661,000**	**13**	**$32,595.66**

Source: FEMA Community Information System as of 5/2/2025

Table 2-23. Santa Ana Repetitive Loss Data by Flood Zone

RL Buildings, Losses, and Payments	AE, A1-30, AO, AH, A	VE, V1-30, V	B, C, X	Total
RL Buildings (Total)	12	0	1	**13**
RL Buildings (Insured)	2	0	0	**2**
RL Losses (Total)	15	0	2	**17**
RL Losses (Insured)	3	0	0	**3**
RL Payments (Total)	$135,929.40	$0.00	$4,030.52	**$139,959.92**
Buildings	$120,571.29	$0.00	$4,030.52	**$124,601.81**
Contents	$15,358.11	$0.00	$0.00	**$15,358.11**
RL Payments (Insured)	$41,209.11	$0.00	$0.00	**$41,209.11**
Buildings	$37,827.84	$0.00	$0.00	**$37,827.84**
Contents	$3,381.28	$0.00	$0.00	**$3,381.28**

Source: FEMA Community Information System as of 5/2/2025

2.4.2 Level of Flood Insurance Coverage

Table 2-24 compares the number of active policies in the SFHA to the number of buildings located in the SFHA. Based on a GIS analysis, the current number of buildings mapped within the FEMA SFHA for the City of Santa Ana is 673. Table 2-20 shows the breakdown of flood insurance policies by FEMA flood zones and there are 533 policies for structures located in the SFHA. When comparing this coverage to the total number of structures in the SFHA (673), 79.2 percent of the structures in the SFHA have flood insurance.

Table 2-24. Percent of Santa Ana Buildings Insured in the SFHA

Flood Zone	Number of Policies In Force	Number of Buildings	% Insured
SFHA	533	673	79.2%

Source: FEMA Community Information System as of 5/2/2025; 2026 Orange County Floodplain Management Plan

2.4.3 Conclusions

The following conclusions can be drawn from the flood insurance and building data reported above:

- Residential structures represent the majority of both active NFIP policies and paid claims in the City. Within this category, single-family homes account for the largest share, underscoring their central role in the community's insured portfolio and its historical flood loss profile.
- In addition to having the highest number of paid claims, residential structures, particularly single-family homes, also account for the greatest total amount of paid claims. This indicates that the most substantial financial losses have been concentrated in this type of structure, reflecting both their prevalence and relative flood vulnerability.
- The SFHA contains the highest number of both active policies and paid claims across all flood zone designations in the City. Within the SFHA, Zone A99 leads in both active policy count and total number of paid claims. This suggests a high degree of risk awareness and/or mortgage-driven insurance uptake in A99-designated areas.
- The SFHA holds the largest share of active policies for pre-FIRM structures, with the majority of these located in Zone A. These older buildings, constructed prior to modern floodplain management regulations, are also responsible for the highest number of claims among pre-FIRM structures, particularly within Zone A99.
- In terms of dollar value, the SFHA accounts for the greatest number of paid claims and Zone A99 accounts for most of the paid claims associated with pre-FIRM structures in the City.
- The SFHA also leads in the number of post-FIRM active policies. The SFHA also accounts for the highest number of paid claims for post-FIRM structures, highlighting that compliance with floodplain regulations does not eliminate risk, especially in high-hazards zones.
- Consistent with pre-FIRM discovery, the highest financial losses among post-FIRM structures are also concentrated in Zone A99.
- The City has identified 13 RL properties, with 12 located within the SFHA and only one located in the B, C, and X Zones. Of these, just two RL properties are insured buildings, and both are situated in the SFHA. This indicates an underinsurance gap among the RL inventory, particularly in high-risk zones.
- A total of 17 RL claims has been recorded in the City, with 15 located in the SFHA and only two located in the B, C, and X Zones. Notably, only 3 RL claims were for insured losses, highlighting a missed opportunity for financial protection.
- The City's cumulative RL claim payments total $139,959.92, with $124,601.81 attributed to building losses and $15,358.11 to contents. Of this total, a significant $135,929.40 (97.1 percent) was paid for RL properties in the SFHA.
- 79.2 percent of the structures located in the SFHA have flood insurance coverage.

2.4.4 Recommendations

The following recommendations are intended to support improved flood insurance coverage for the City of Santa Ana:

- Launch a comprehensive and sustained public education initiative aimed at increasing awareness of flood risk, insurance availability, and practical mitigation strategies. This initiative should target both SFHA and non-SFHA areas to address the widespread flood-risk exposure observed across all flood zones.
- Prioritize education and engagement with owners of older structures and structures located in the A99 Zone of the benefits of flood insurance and mitigation measures, which are disproportionately responsible

for historical flood damages and claims. Zone A99 designation indicates that protection by a flood control system such as a levee is planned or underway but has not yet been completed.

2.4.5 Submit to Governing Body

The assessment document (containing only general or aggregated data or maps) must be submitted to the community's governing body for CRS purposes. No action is needed by the governing body for a stand-alone FIA report. The objective is to inform the elected leaders about flood insurance coverage. They may opt to take the step, which is to prepare a plan to improve coverage.

2.4.6 Reassessment

Updated flood insurance data must be obtained five years after the assessment was done. The new information is used to update the level of coverage and the recommendations. The document is revised accordingly to maintain CRS credit criteria and submitted to the community's governing body. No action is needed by the governing body.

3. COUNTY PROFILE

Profile information for Orange County is provided here to develop an understanding of the County's flood hazard vulnerability. This will include an examination of flooding history, and location characteristics to ascertain the extent and degree of flood hazard vulnerability. This County Profile section is organized into four sub-sections: a brief history, location, governing body, and population.

3.1 BRIEF HISTORY

Orange County was incorporated in 1889 after separating from Los Angeles County. Originally an agricultural region, the county's economy in the early twentieth century increasingly included oil extraction, while tourism also grew as the area benefited from its proximity to the Los Angeles metropolitan region. World War II and the postwar economic expansion brought substantial population growth and industrial development. By the 1990 Census, Orange County's population had surpassed 2 million, and today it is one of the largest counties in the United States by population. The County of Orange includes 34 cities. The largest city is Anaheim, and the smallest is Villa Park. Many smaller cities contract with County departments or the Orange County Fire Authority for selected services; 13 cities contract with the Orange County Sheriff's Department for law enforcement services, and the Orange County Fire Authority serves 23 cities plus unincorporated areas. In addition, the County provides services to numerous unincorporated communities, including rural residential areas in the eastern foothills of the Santa Ana Mountains, unincorporated islands within the county's urban areas, and planned communities in southern Orange County.

Since 1953, Orange County has received 37 federal disaster proclamations including 25 Presidential Disaster Declarations, 3 Presidential Emergency Proclamations, and 9 Fire Management Assistance declarations. While the greatest recurring threat is flooding and wildfire, the risk of catastrophic earthquakes is ever-present. Since the HMP was last revised in 2015, the County of Orange has received four federal disaster declarations, including flooding and damage from a major winter storm in January 2017, the Canyon II Fire in October 2017, the Holy Fire in 2018, and the COVID-19 pandemic in 2020. In the fall of 2020, Fire Management Assistance Grants were approved for the Silverado and Bond Fires in the County's rural unincorporated areas and the Blue Ridge Fire near Yorba Linda and Chino Hills State Park.

The County's administrative and legislative functions are performed by a five-member Board of Supervisors, who are elected to four-year terms. Elections are held in offsetting years based on the supervisory district. For the purposes of flood mitigation planning, the Board of Supervisors will be the body that reviews and would ultimately be responsible for voting on this RLAA. The Board of Supervisors would also be responsible for adopting policies and regulations aimed at implementing the flood mitigation activities recommended by this document (Orange County Board of Supervisors n.d.). It is noteworthy to mention that each jurisdiction participating in this RLAA must adopt the plan separately by their respective legislative body with funding / implementation authority.

3.1.1 Anaheim Brief History

The City of Anaheim was established in 1857 by German immigrants who acquired land from the Mexican land grant Rancho San Juan Cajón de Santa Ana. Initially, they created a cooperative agricultural community focused on grape cultivation for wine production. However, after a disease wiped out the vineyards, the community transitioned to growing citrus fruits, chili peppers, and walnuts. The arrival of railroads facilitated the transportation of Anaheim's agricultural products to eastern markets, fostering growth and development.

The City's rapid transformation began in the mid-20th century with the opening of Disneyland in 1955, which quickly became one of the nation's most beloved tourist attractions. This milestone significantly boosted Anaheim's economy and spurred further urban and industrial expansion. In the 1960s, the city also developed major aerospace facilities and became home to professional sports teams, including the Anaheim Angels and the Anaheim Ducks. Today, Anaheim is celebrated for its vibrant cultural attractions, such as the Anaheim Museum and the annual Halloween Parade and forms a metropolitan complex with Santa Ana and Irvine (Britannica 2025)

3.1.2 Newport Beach Brief History

The City of Newport Beach was officially incorporated on September 1, 1906, and its current City Charter was adopted in 1954. Renowned for its upscale residential neighborhoods, modern shopping centers, robust businesses, and excellent school system, Newport Beach is a highly desirable place to live and work. The city encircles Newport Bay, where approximately 4,300 boats of various types are moored within the expansive 21-square-mile harbor area. This picturesque bay, along with the city's eight miles of pristine ocean beaches, provides ample opportunities for outstanding fishing, swimming, surfing, and a wide range of aquatic sports activities. Newport Beach's unique blend of natural beauty and urban amenities makes it a vibrant and attractive coastal community (City of Newport Beach 2025).

3.1.3 San Juan Capistrano Brief History

San Juan Capistrano stands out in Orange County and is a rare gem in California, with its roots tracing back to the earliest inhabitants of the region. Over the past 220 years, it has continually evolved, reflecting the dynamic history of California. California history, and therefore San Juan Capistrano history, is often divided into five major eras: Prehistory, the Spanish era, the Mexican/Rancho Era, Statehood, and the Twentieth Century. Each era brought distinct changes and influences, from the mission's prosperity and subsequent decline during the Mexican secularization to the transformation of the town in the 20th century. Today, San Juan Capistrano stands as a testament to its diverse historical roots and ongoing evolution (City of San Juan Capistrano n.d.).

3.1.4 Santa Ana Brief History

Incorporated in 1886, Santa Ana has become the governmental hub of Orange County, often referred to as Downtown Orange County. Its strategic location places the city within a 30-minute drive from numerous Southern California attractions, including four airports. The city's high density and robust transportation network allow residents and workers to adopt sustainable commuting options such as buses, trains, bicycles, and walking. This accessibility draws a diverse population that enjoys Santa Ana's unique housing options, vibrant nightlife, and cultural landmarks like the Artist's Village, Discovery Cube Orange County, Heritage Museum of Orange County, and the Santa Ana Zoo at Prentice Park. Santa Ana boasts a substantial and varied business community, with over 30,000 businesses employing more than 150,000 people. It is home to the headquarters of major companies like Behr Paint and First American Financial Corporation. In 2016, Standard and Poor's awarded Santa Ana an AA issuer credit rating (City of Santa Ana n.d.).

3.2 LOCATION

This section describes the physical setting of Orange County, including its location, land use and land cover. The physical setting of a community can have an impact on the flooding hazards that a community can experience. For example, because Orange County is located on the coast and in a seismically active part of the country,

Orange County is exposed to coastal flooding in the form of high tide flooding and sea level rise, as well as tsunamis. The terrain and land cover can also influence the flooding exposure of a community. Having large amounts of impervious land cover can cause increased runoff and flooding because the impervious surfaces don't allow flood waters to infiltrate into the ground. Steep terrain also can influence the flooding exposure a community has because it causes water from rainfall to run off more quickly and may lead to instances of flash flooding.

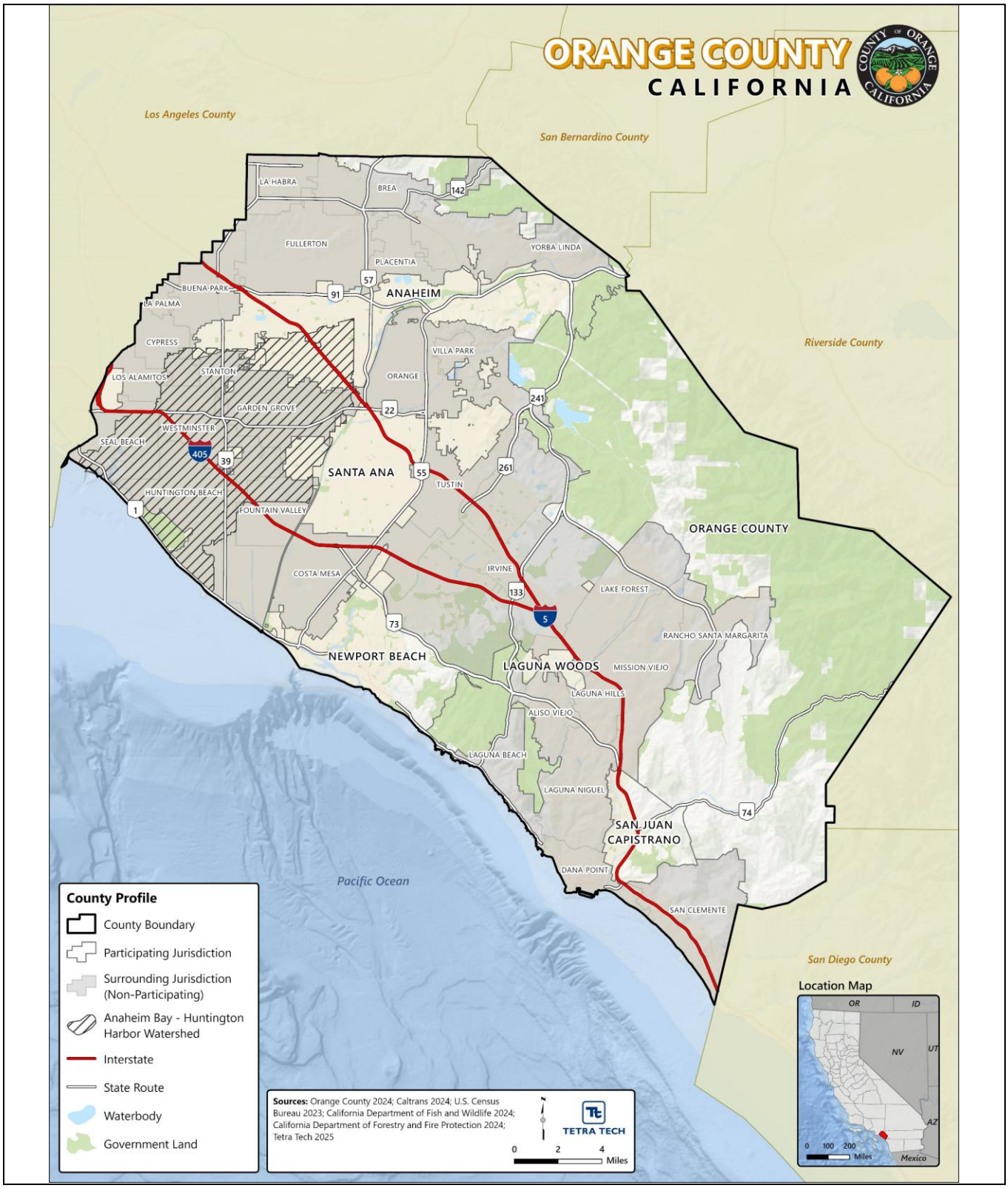
Unincorporated areas in Orange County are scattered throughout the region, often surrounded by incorporated cities (OC LAFCO 2025). These areas include diverse communities such as Coto de Caza, Ladera Ranch, and North Tustin. They are typically characterized by their rural or suburban settings and often maintain a distinct identity separate from nearby cities (Enjoy OC 2024). Despite being unincorporated, these areas benefit from county services and have unique demographic profiles.

Orange County covers 948 square miles in Southern California. According to the Orange County General Plan, about 70 percent of its land area lies within incorporated municipalities, with the remainder under County jurisdiction (OC Sheriff's Department 2021). The county is bordered by the Counties of Los Angeles to the north, San Berardino and Riverside to the east, and San Diego to the south. Orange County has 42 miles of coastline along its western border (OC Sheriff's Department 2021). The major landmarks in the county include the Santa Ana Mountain Range, the Pacific Ocean, Newport Bay, Seal Beach National Wildlife Refuge, and Cleveland National Forest. Figure 3-1 is a general reference map of Orange County.

3.3 GOVERNING BODY FORMAT

Unincorporated areas in Orange County are governed directly by the County of Orange rather than by a city council. The Orange County Board of Supervisors, consisting of five elected members, serves as the legislative and executive body for these areas. The Board sets policies, enacts ordinances, and oversees the county's budget and services. Additionally, various county departments manage day-to-day operations, including public works, law enforcement, and planning. This structure ensures that residents of unincorporated areas receive essential services and representation at the county level.

Figure 3-1. Orange County General Reference Map



3.4 POPULATION

According to the U.S. Census, the 2020 population for Unincorporated Orange County was 132,877. This is 14.3-percent of the participating jurisdiction population total.

Research has shown that some populations are at greater risk from hazard events because of decreased resources or physical abilities. These populations can be more susceptible to hazard events based on a number of factors including their physical and financial ability to react or respond during a hazard, and the location and construction quality of their housing. Data from the American Community Survey 5-Year Population Estimates indicates that 5.5 percent of the population is 5 years of age or younger, 15.4 percent is 65 years of age or older, 5.2 percent is non-English speaking, 6.1 percent is below the poverty threshold, and 8.0 percent is considered disabled.

4. REPETITIVE LOSS AREAS

Four of the participating jurisdictions have CRS RL properties and RL areas (RLAs). The 2025 CRS Coordinator's Manual outlines how an RL area should be mapped. The RL areas must include the properties on FEMA's RL properties lists and all of the nearby properties with the same or similar flooding conditions. The reason for including nearby properties is that these properties may have experienced flooding in the past and may have not been captured on FEMA's RL property list because they have only one claim if they are NFIP insured or may have not been insured when the flooding occurred. Thus, these nearby structures have the same flood exposure to repeated flooding as the RL property and need to be addressed (FEMA 2025). It should be noted that RL properties and RL areas were analyzed for the entire county and the RL areas listed in the participating jurisdictions may not be numbered in sequential order.

To comply with the Privacy Act and Personally Identifiable Information (PII) guidelines, Tetra Tech applied a general mapping approach for RLAA reporting (FEMA 2015b). A half-mile buffer was assessed to the RL areas and the structures located within the buffers identified to the structures near the RL properties. Existing CRS communities maintain CRS Activity 502, managing their RL area mailing list utilizing for the Category B requirements. The RLAA half-mile aggregate RL area buffer applied to Category B communities is a greater area than the community-maintained CRS Activity 502 RL area inventory. The community-identified RL area inventory is appropriate for the source of flooding identified by the community and supported by aggregate data assessments.

Figure 4-1. Privacy Act Requirements

The Privacy Act

Flood insurance data about private property, including repetitive loss properties, are protected under the Privacy Act. Personally identifiable Information such as the names or addresses of specific properties, whether they are covered by flood insurance or not, whether they have received flood insurance claims, or the amounts of such claims may not be released outside of local government agencies or to the public or used for solicitation or other purposes. Such information should be marked "For internal use only. Protected by the Privacy Act of 1974."

General or aggregated information, such as total claims paid for a community or an area or data not connected to a particular property may be made public.

Source: (FEMA 2025)

In addition to the general buffer applied to the RL areas, Tetra Tech utilized 2022 USACE National Structure Inventory and ESRI ArcGIS Pro to develop the RL area building stock inventory for the building assessment and problem source (source of flooding) determination. Each CRS community maintains information for its community needed for CRS Activity 501 documentation. Structure attributes on occupancy type, number of stories, and foundation type were determined for each RL area, and this information was used to help identify the mitigation measures that can be undertaken to reduce the flooding impact within these RL areas. The information about the structure occupancy type, number of floors, and foundation are the top 3 of each of those categories.

4.1 UNINCORPORATED ORANGE COUNTY

Unincorporated Orange County contains six RL properties based on 2023 FEMA RL data, located in six RL areas. A CRS Activity 501 transmittal was completed for properties identified to be outside unincorporated Orange County. Table 4-1 summarizes the claims history for the six RL properties. To identify RL areas, a half-mile buffer was applied to the RL properties and structures within the buffers were included. The County maintains the RL inventory and maps following Personally Identifiable Information (PII) standards.

Tetra Tech, in partnership with the County, reviewed the RL areas against the community's Activity 502 RL flooding source determinations. The RLAA problem statements listed in Table 4-2 align with the County's individual assessment of the flooding sources in the RL areas.

It was determined that the County's existing RL area mailing list meets the program criteria for CRS Activity 510 (Repetitive Loss Area Annual Mailer).

Table 4-1. RL Claim History in Unincorporated Orange County

FEMA RL Number ID	RL Area	Mitigated	Cumulative Building Payment	Cumulative Contents Payment	Total Losses	Total Paid	NFIP Repetitive Loss Flag
111621	RLA1	NO	$2288.17	$0.00	2	$2288.17	YES
112017	RLA2	NO	$4111.41	$7.12	2	$4118.53	YES
137786	RLA3	NO	$45355.62	$7737.75	3	$53093.37	YES
282434	RLA4	NO	$34686.00	$12838.35	2	$47524.35	YES
315570	RLA5	NO	$16067.92	$0.00	2	$16067.92	YES
95573	RLA6	NO	$6728.18	$11976.84	2	$18705.02	YES

FEMA RL Data as of November 27, 2023, NFIP RL (Y)

Table 4-2. RL Area Problem Statements for Unincorporated Orange County

RL Area	FEMA RL Number ID	Problem Statement
RLA1	111621	Runoff from adjacent higher ground properties
RLA2	112017	Runoff from adjacent higher ground properties and poor interior drainage
RLA3	137786	Silverado Canyon flooding extent (approximately the 25-yr event)
RLA4	282434	Hillside canyon flooding
RLA5	315570	Silverado Canyon hillside slope flooding
RLA6	95573	Runoff from adjacent higher ground properties

FEMA RL Data as of November 27, 2023, NFIP RL (Y)

4.1.1 Unincorporated Orange County RL Area Structures

There are 2,396 structures in the six RL areas for unincorporated Orange County. Most of the structures are single-family residential structures, which make up 95.4 percent of the occupancy type. As for the number of stories, 72.9 percent of the structures have one story. Finally, 44.9 percent of the structures have a slab foundation, while 41.9% have a crawl space foundation. Table 4-3 shows the top three occupancy type, number of stories, and foundation types for the structures located in the RL areas of unincorporated Orange County.

Table 4-3. Summary of Structures in All Unincorporated Orange County RL Areas

	Number	Percentage
Occupancy		
Single-Family Residential	2,286	95.4%
Professional or Technical Services	48	2.0%
Construction	17	0.7%
Stories		
1 Story	1,746	72.9%
2 Stories	608	25.4%
3 Stories	39	1.6%
Foundation		
Slab	1,076	44.9%
Crawl Space	1,005	41.9%
Basement	315	13.1%
Total Number of Structures	**2,396**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

4.1.2 Unincorporated Orange County RLA1

To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL areas around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information. Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RLA1 is shown in Figure 4-2.

Based on the half-mile buffer and the U.S. Army Corps of Engineers National Structure Inventory data, there are 510 structures located in the RL Area 1 for Unincorporated Orange County. Based on the occupancy type, the most common structure occupancy type for this RL area is single-family residential, which is 97.1 percent of the total structures. When looking at the number of stories, the majority of the structures in this area is single story, which makes up 76.1 percent of the total structures. Finally, the most common foundation type for this area is either slab foundation, which is 46.9 percent of the total structures or crawl space foundation which is 41.4 percent of the total structures. This data suggests that the most common structure for this RL area is a single-family residential structure that is single story with either a slab or crawlspace foundation. Table 4-4 shows the top three occupancy types, number of stories, and foundation types for this RL area. The flooding source for this RL area is “Runoff from adjacent higher ground properties.”

RLA1 of Unincorporated Orange County has one RL property. This property is a single-family residential structure with two stories and a total of 5,936 square feet.

Table 4-4. Summary of Structures for Unincorporated Orange County RL Area 1

	Number	Percentage
Occupancy		
Single-Family Residential	495	97.1%
Professional or Technical Services	8	1.6%
Construction	2	0.2%

	Number	Percentage
Stories		
1 Story	388	76.1%
2 Stories	115	22.5%
3 Stories	7	1.4%
Foundation		
Slab	239	46.9%
Crawl Space	211	41.4%
Basement	60	11.8%
Total Number of Structures	**510**	

Table 4-5. Problem Statement for Unincorporated Orange County RL Area 1

FEMA Repetitive Loss Property #	Problem Statement
111621	Runoff from adjacent higher ground properties

Note: Flooding source reviewed and provided by the community

Figure 4-2. Unincorporated Orange County Repetitive Loss Area 1

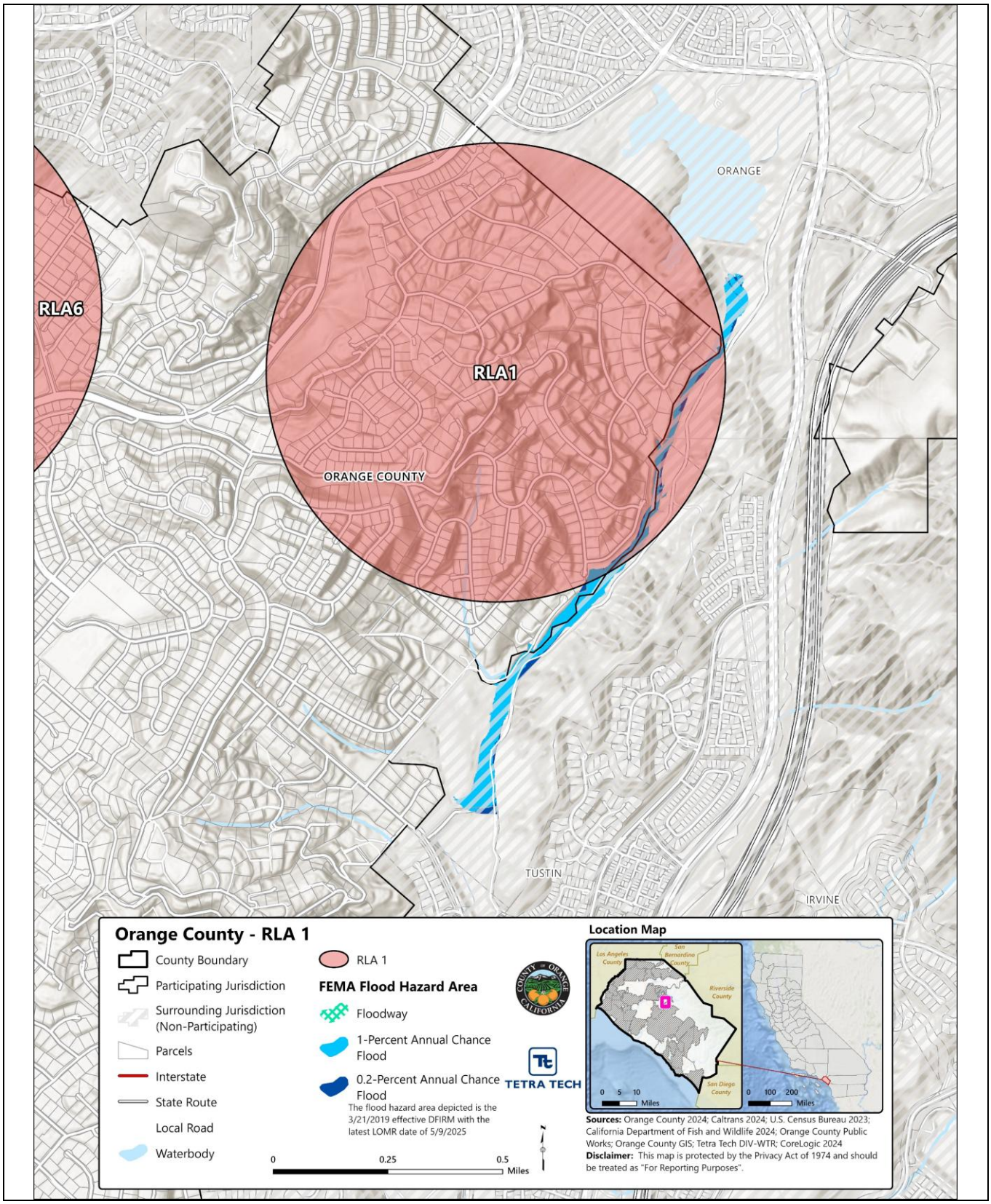


Table 4-6. All Properties in Unincorporated Orange County RLA1

FEMA Repetitive Loss Property #	Number of Insurable Buildings	Building Description				Probable Mitigation Measures
		Foundation	Occupancy Type	Stories	Square Footage	
111621	1	*Slab on grade	Single-family residential	2	5,936	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC. Structural elevation, foundation mitigation techniques, and floodproofing considerations.
Total	**1**					

Source: FEMA/ISO; U.S. Army Corps of Engineers National Structure Inventory 2022
*Unable to confirm foundation type from public data sources. From photo assessment, the foundation type assumption is slab on grade

4.1.3 Unincorporated Orange County RLA2

To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL areas around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information. Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RLA2 is shown in Figure 4-3.

There are 799 structures located in the RL Area 2 for Unincorporated Orange County. When looking at the occupancy class, the most common occupancy class for this RL area is single-family residential, which makes up 95.1 percent of the total structures. When looking at the number of stories, single story structures make up most of the structures for this RL area with 75.5 percent of the total structures. Finally, the most common foundation type is either a slab foundation, which is 44.6 percent of the total structures or crawl space which is 42.1 percent of the total structures. This data suggests that the most common structures for this RL area is a single-family residential structure that is single story with either a slab or crawlspace foundation. Table 4-7 shows the top three occupancy classes, number of stories, and foundations for this RL area. The flooding source for this RL area is “Runoff from adjacent higher ground properties, poor interior drainage.”

RLA2 of Unincorporated Orange County has one RL property. The occupancy type for this property is single family residential. The structure is 2 stories with a slab foundation and a square footage of 4,504.4 square feet.

Figure 4-3. Unincorporated Orange County Repetitive Loss Area 2

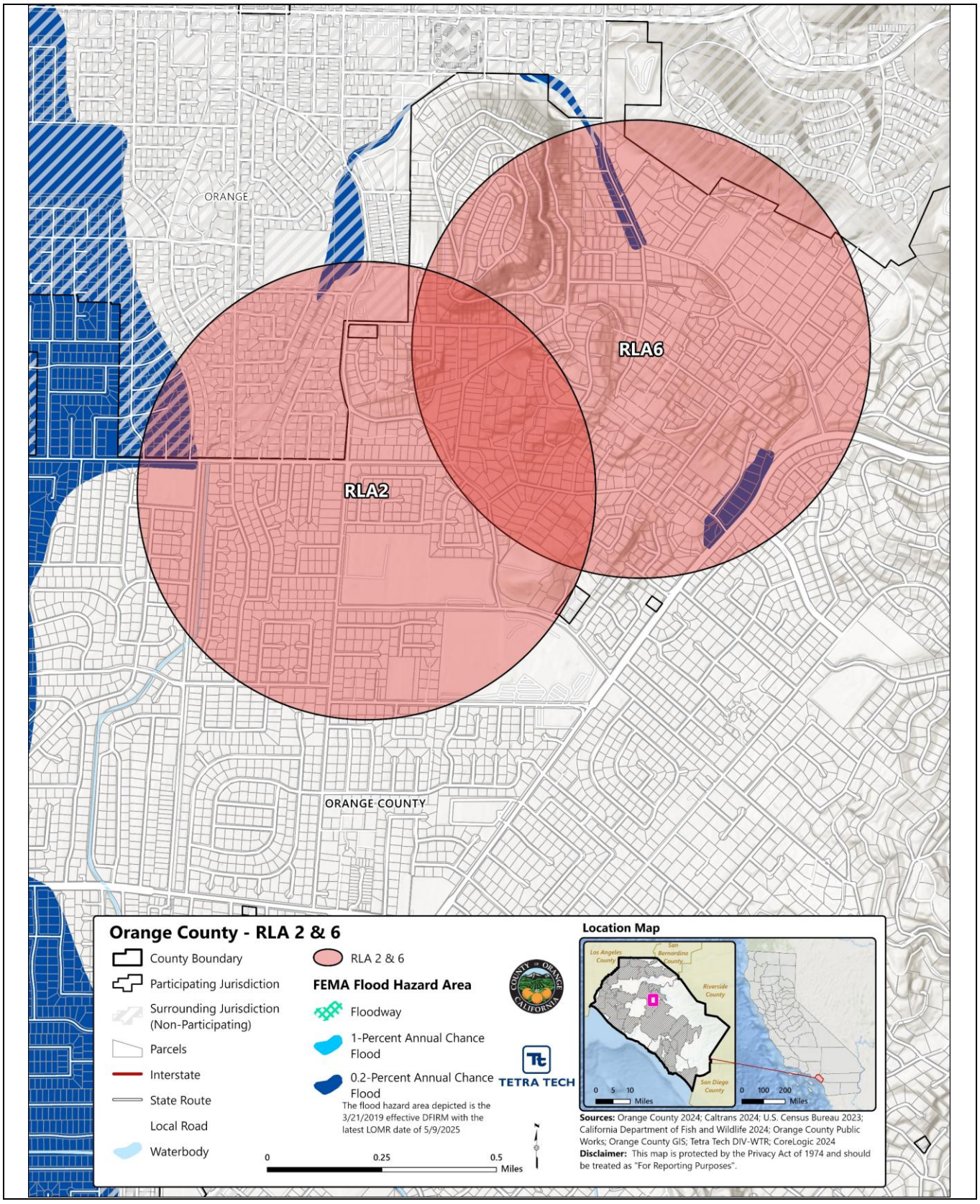


Table 4-7. Summary of Structures in Unincorporated Orange County RLA2

	Number	Percentage
Occupancy		
Single-Family Residential	760	95.1%
Professional or Technical Services	23	2.9%
Construction	8	1.0%
Stories		
1 Story	603	75.5%
2 Stories	194	24.3%
3 Stories	2	0.3%
Foundation		
Slab	356	44.6%
Crawl Space	336	42.1%
Basement	107	13.4%
Total Number of Structures	**799**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

Table 4-8. Problem Statement for Unincorporated Orange County RLA2

FEMA Repetitive Loss Property #	Problem Statement
112017	Runoff from adjacent higher ground properties. Poor interior drainage

Note: Flooding source reviewed and provided by the community

Table 4-9. All Properties in Unincorporated Orange County RLA2

FEMA Repetitive Loss Property #	Number of Insurable Buildings	Building Description				Probable Mitigation Measures
		Foundation	Occupancy Type	Stories	Square Footage	
112017	1	Slab	Single Family Residential	2	4,504.4	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC. Structural elevation, foundation mitigation techniques, and floodproofing considerations.
Total	**1**					

Source: FEMA/ISO; U.S. Army Corps of Engineers National Structure Inventory 2022

4.1.4 Unincorporated Orange County RLA3

To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL areas around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information. Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RLA3 is shown in Figure 4-4.

There are 47 structures located in RL Area 3 for Unincorporated Orange County. When looking at the occupancy type, the most common occupancy type for structures located in this RL area is single-family residential structure, which makes up 95.7 percent of the total structures. When looking at the number of stories, structures that are single story are the most common in this RL area, which makes up 61.7 percent of the total structures. Finally, the most common structure foundation for this RL area is either crawl space foundation or slab foundation. Both of these foundation types make up 38.3% of the total structures. This data suggests that the most common structure for this RL area is a single-family residential structure that is single story with either a crawl space or slab on ground foundation. Table 4-10 shows the top three occupancy types, number of stories, and foundation types for this RL area. The flooding source for this RL area is "Silverado Canyon flooding extent (approximately the 25-yr event)."

RLA3 of Unincorporated Orange County has one RL property. The occupancy type for this property is single-family residential. The structure has two stories on a crawl space foundation, and the square footage of the structure is 1,383.6 square feet.

Table 4-10. Summary of Structures in Unincorporated Orange County RLA3

	Number	Percentage
Occupancy		
Single-Family Residential	45	95.7%
Retail	1	2.1%
Construction	1	2.1%
Stories		
1 Story	29	61.7%
2 Stories	15	31.9%
3 Stories	2	4.3%
Foundation		
Slab	18	38.3%
Crawl Space	18	38.3%
Basement	11	23.4%
Total Number of Structures	**47**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

Table 4-11. Problem Statement for Unincorporated Orange County RLA3

FEMA Repetitive Loss Property #	Problem Statement
137786	Silverado Canyon flooding extent (approximately the 25-yr event)

Note: Flooding source reviewed and provided by the community

Figure 4-4. Unincorporated Orange County Repetitive Loss Area 3

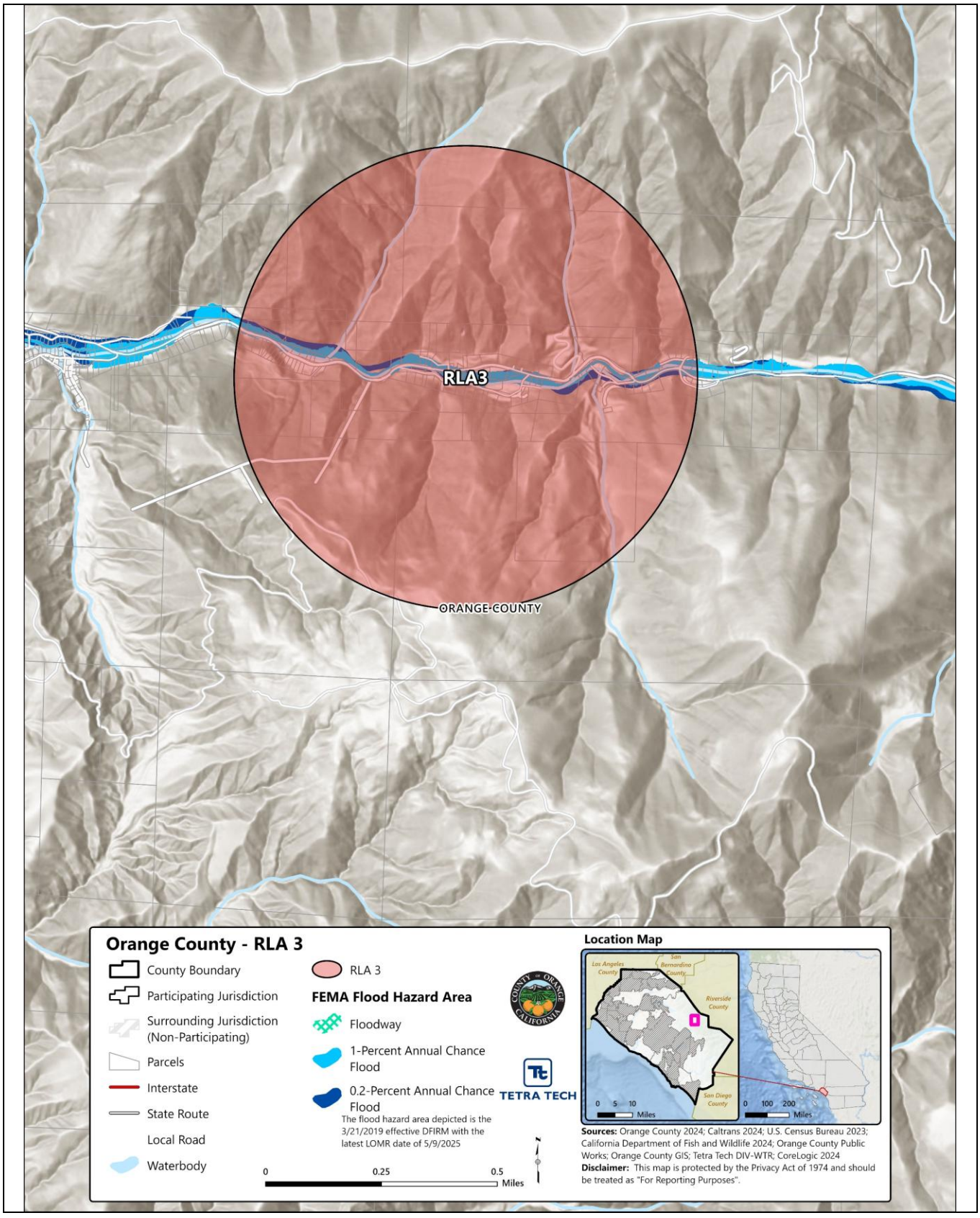


Table 4-12. All Properties in Unincorporated Orange County RLA3

FEMA Repetitive Loss Property #	Number of Insurable Buildings	Building Description				Probable Mitigation Measures
		Foundation	Occupancy Type	Stories	Square Footage	
137786	1	Crawl space	Single-family residential	2	1,383.6	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC. Structural elevation, foundation mitigation techniques, and floodproofing considerations.
Total	**1**					

Source: FEMA/ISO; U.S. Army Corps of Engineers National Structure Inventory 2022

4.1.5 Unincorporated Orange County RLA4

To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL areas around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information. Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RLA4 is shown in Figure 4-5.

There are 136 structures located in RL Area 4 for Unincorporated Orange County. When looking at the occupancy type, the most common occupancy type for this RL area is single-family residential, which makes up 93.4 percent of the total structures. When looking at the number of stories, structures that are single story make up 68.4 percent of the total structures. Finally, the most common foundation type for this RL area is a slab foundation which makes up 51.5 percent of the total structures. Based on this data, the most common structures for this RL area are a single-family residential structure that is single story with a slab foundation. Table 4-13 shows the top three occupancy types, number of stories, and foundation types for this RL area. The flooding source for this RL area is “Hillside canyon flooding.”

RLA4 of Unincorporated Orange County has one RL property. The occupancy type for this property is single-family residential. The structure is single story on a slab foundation, and the square footage of the structures is 2,686.6 square feet.

Figure 4-5. Unincorporated Orange County Repetitive Loss Area 4

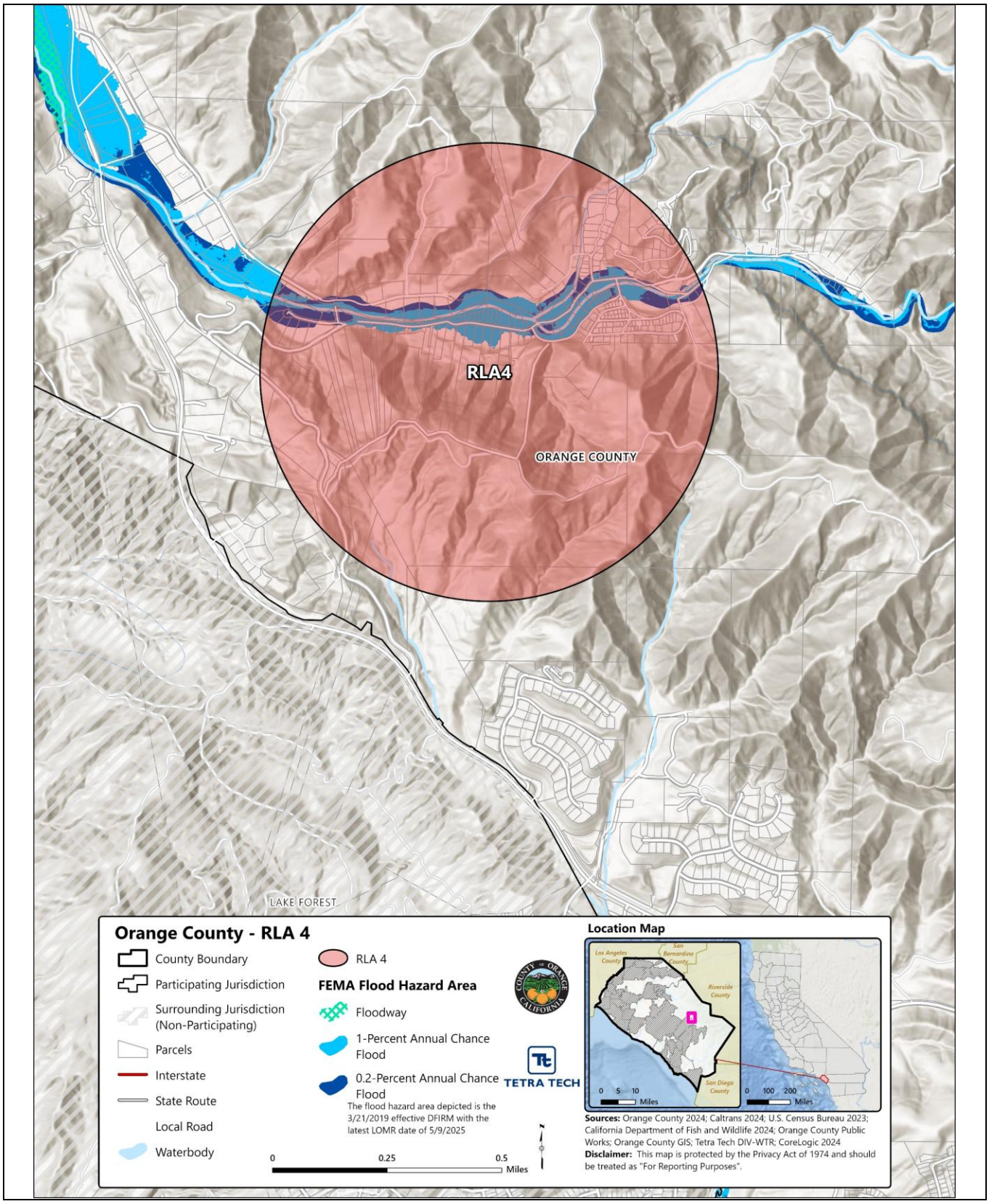


Table 4-13. Summary of Structures in Unincorporated Orange County RLA4

	Number	Percentage
Occupancy		
Single-Family Residential	127	93.4%
Retail	2	1.5%
Construction	2	1.5%
Stories		
1 Story	93	68.4%
2 Stories	31	22.8%
3 Stories	12	838%
Foundation		
Slab	70	51.5%
Crawl Space	49	36.0%
Basement	17	12.5%
Total Number of Structures	**136**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

Table 4-14. Problem Statement for Unincorporated Orange County RLA4

FEMA Repetitive Loss Property #	Problem Statement
282434	Hillside canyon flooding

Note: Flooding source reviewed and provided by the community

Table 4-15. All Properties in Unincorporated Orange County RLA4

FEMA Repetitive Loss Property #	Number of Insurable Buildings	Building Description				Probable Mitigation Measures
		Foundation	Occupancy Type	Stories	Square Footage	
282434	1	Slab	Single-family residential	1	2,686.6	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC. Structural elevation, foundation mitigation techniques, and floodproofing considerations.
Total	**1**					

Source: FEMA/ISO; U.S. Army Corps of Engineers National Structure Inventory 2022

4.1.6 Unincorporated Orange County RLA5

To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL areas around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information. Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RLA5 is shown in Figure 4-6.

There are 141 structures located in RL Area 5 for Unincorporated Orange County. When looking at the occupancy type, the most common occupancy type for this RL area is single-family residential, which makes up 90.1 percent of the total structures. When looking at the number of stories, structures that are a single story make up most of the structures which is 71.6 percent of the structures. Finally, the most common foundation type for structures in this RL area is either a slab foundation, which makes up 47.5 percent of the total structures or a crawl space foundation which makes up 39.7 percent of the total structures. Based on this data, the most common structures in this RL area are a single-family residential structure that is single story with either a slab or crawl space foundation. Table 4-16 shows the top three occupancy types, number of stories, and foundation types for this RL area. The flooding source for this RL area is "Silverado Canyon hillside slope flooding."

RLA5 of Unincorporated Orange County has one RL property. The occupancy type for this property is single-family residential. This structure is a single-story building with a crawl space foundation and a square footage of 1,278.5 square feet.

Table 4-16. Summary of Structures in Unincorporated Orange County RLA5

	Number	Percentage
Occupancy		
Single-Family Residential	127	90.1%
Professional or Technical Services	2	1.4%
Entertainment or Recreational	2	1.4%
Stories		
1 Story	101	71.6%
2 Stories	30	21.3%
3 Stories	8	5.7%
Foundation		
Slab	67	47.5%
Crawl Space	56	39.7%
Basement	18	12.8%
Total Number of Structures	**141**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

Table 4-17. Problem Statement for Unincorporated Orange County RLA5

FEMA Repetitive Loss Property #	Problem Statement
315570	Silverado Canyon hillside slope flooding

Note: Flooding source reviewed and provided by the community

Figure 4-6. Unincorporated Orange County Repetitive Loss Area 5

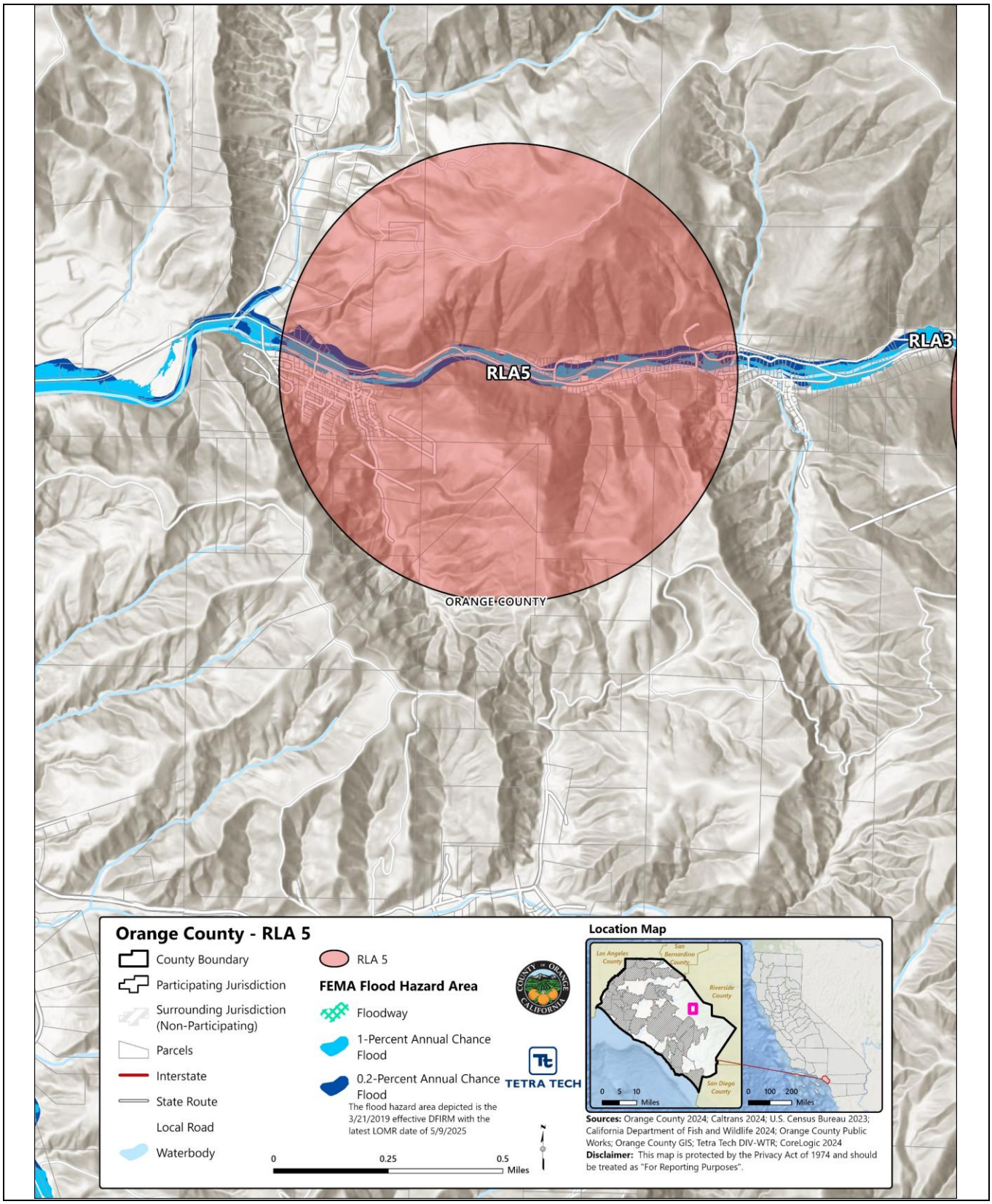


Table 4-18. All Properties in Unincorporated Orange County RLA5

FEMA Repetitive Loss Property #	Number of Insurable Buildings	Building Description				Probable Mitigation Measures
		Foundation	Occupancy Type	Stories	Square Footage	
315570	1	Crawl space	Single-family residential	1	1,278.5	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC. Structural elevation, foundation mitigation techniques, and floodproofing considerations.
Total	**1**					

Source: FEMA/ISO; U.S. Army Corps of Engineers National Structure Inventory 2022

4.1.7 Unincorporated Orange County RLA6

To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL areas around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information. Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RLA6 is shown in Figure 4-7.

There are 973 structures located in RL Area 6 for Unincorporated Orange County. When looking at the occupancy type, the most common occupancy type for this RL area is single-family residential, which makes up 96.3 percent of the total structures. When looking at the number of stories, structures that are a single story make up 68.7 percent of the total structures. Finally, the most common foundation type for this RL area is either crawl space, which is 44.2 percent of the total structures or a slab foundation, which is 43.2 percent of the total structures. Based on this data, the most common structure for this RL area is a single-family residential structure that is single story with either a crawl space or slab foundation. Table 4-19 shows the top three occupancy types, number of structures, and foundation types for this RL area. The flooding source for this RL area is “Runoff From Higher Adjacent Ground Properties.”

RLA 6 of Unincorporated Orange County has one RL property. The occupancy type for this property is single family residential. The structure is a single story with a slab foundation and 3,423.3 square feet.

Figure 4-7. Unincorporated Orange County Repetitive Loss Area 6

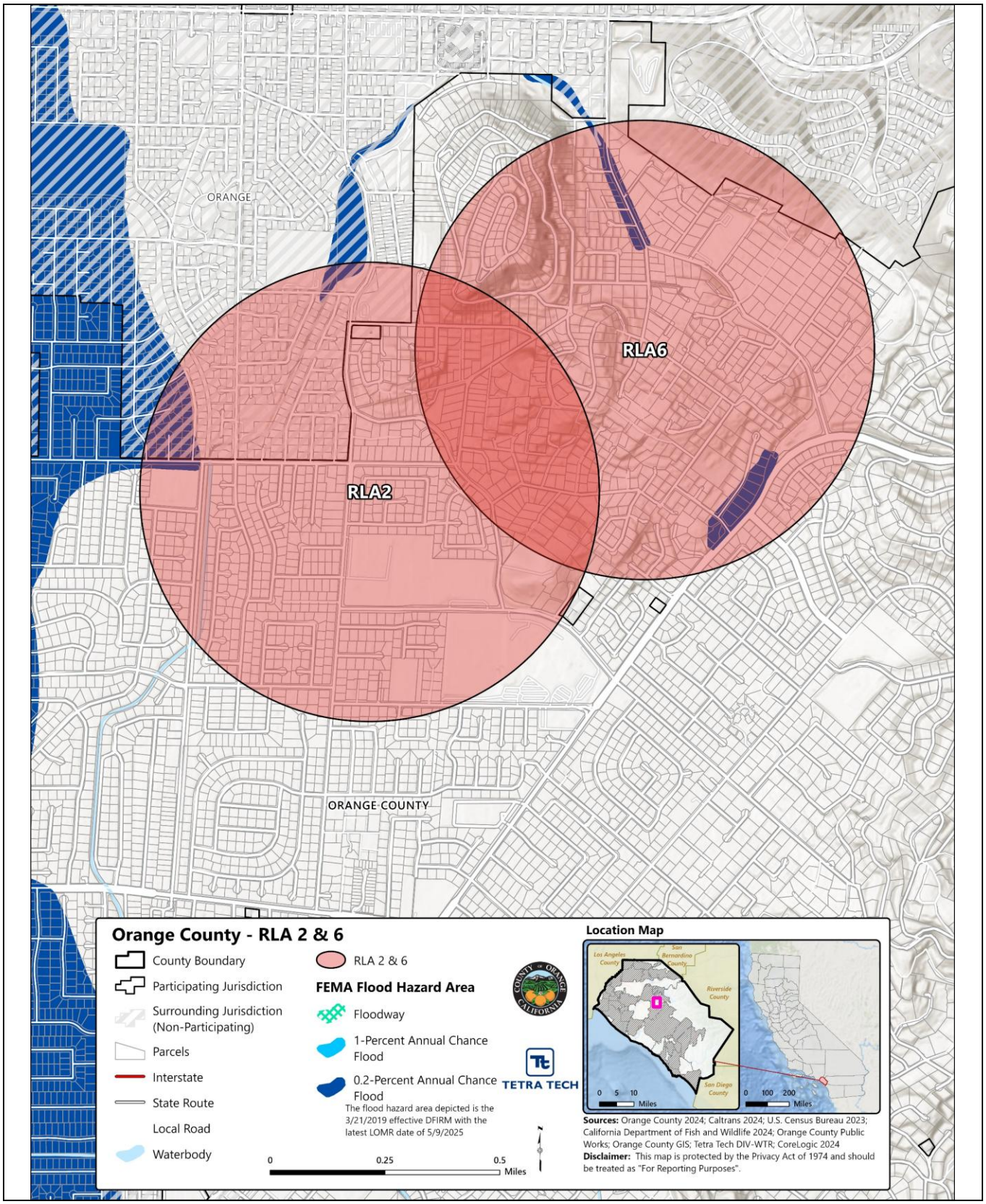


Table 4-19. Summary of Structures in Unincorporated Orange County RLA6

	Number	Percentage
Occupancy		
Single-Family Residential	937	96.3%
Professional or Technical Services	16	1.6%
Agricultural Building	4	0.4%
Stories		
1 Story	668	68.7%
2 Stories	295	30.3%
3 Stories	10	1.0%
Foundation		
Crawl Space	430	44.2%
Slab	420	43.2%
Basement	123	12.6%
Total Number of Structures	**973**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

Table 4-20. Problem Statement for Unincorporated Orange County RL Area 15

FEMA Repetitive Loss Property #	Problem Statement
95573	Runoff from adjacent higher ground property

Note: Flooding source reviewed and provided by the community.

Table 4-21. All Properties in Unincorporated Orange County RLA6

FEMA Repetitive Loss Property #	Number of Insurable Buildings	Building Description				Probable Mitigation Measures
		Foundation	Occupancy Type	Stories	Square Footage	
95573	1	Slab	Single Family Residential	1	3,423.3	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC. Structural elevation, foundation mitigation techniques, and floodproofing considerations.
Total	**1**					

Source: FEMA/ISO; U.S. Army Corps of Engineers National Structure Inventory 2022

4.2 CITY OF NEWPORT BEACH

The City of Newport Beach has eight RL properties based on 2023 FEMA RL data, located in seven RL areas. Table 4-22 summarizes the claims history for the RL properties. To identify RL areas, a half-mile buffer was applied to the RL properties and structures within the buffers were included. The City maintains the RL inventory and maps following PII standards.

Table 4-22. RL Claim History in Newport Beach

FEMA RL Number ID	RL Area	Mitigated	Cumulative Building Payment	Cumulative Contents Payment	Total Losses	Total Paid	NFIP Repetitive Loss Flag
91102	RLA1	NO	$18019.92	$0.00	2	$18019.92	YES
91122	RLA2	NO	$15962.42	$1584.90	2	$17547.32	YES
92161	RLA3	NO	$9020.26	$47758.06	2	$56778.32	YES
93881	RLA4	NO	$5206.02	$0.00	2	$5206.02	YES
127946	RLA5	NO	$9609.95	$6852.00	2	$16461.95	YES
138089	RLA6	NO	$12338.27	$0.00	2	$12338.27	YES
138176	RLA7	NO	$23203.24	$0.00	2	$23203.24	YES
235973	RLA8	NO	$15112.74	$0.00	2	$15112.74	YES

FEMA RL Data as of November 27, 2023

Tetra Tech, in partnership with the City, reviewed the RL areas against the community's Activity 502 RL flooding source determinations. The RLAA problem statements listed in Table 4-23 align with the City's individual assessment of the flooding sources in the RL areas.

It was determined that the City's existing RL area mailing list meets the program criteria for CRS Activity 510 (Repetitive Loss Area Annual Mailer).

Table 4-23. RL Area Problem Statements for Newport Beach

RL Area	FEMA RL Number ID	Problem Statement
RLA1	91102	Poor Local Drainage, property lower than street
RLA2	91122	Wave facing coastal flooding near harbor inlet
RLA3	92161	Runoff from adjacent higher ground properties
RLA4	93881	Water accumulation in downstream half of alley with garages near street level
RLA5	127946	Poor local drainage, property lower than street
RLA6	138089	Garages near street level near drains to bay
RLA7	138176	Low area around storm drains
RLA8	235973	Garages near street level near drains to bay

4.2.1 City of Newport Beach RL Area Structures

There are 8,406 structures located in the 8 RL areas for Newport Beach. When looking at the overall occupancy type for the identify structures in the RL areas, the majority of the structures are single-family residential structures, which make up 79.7 percent of the occupancy type. For the number of stories, 56.8 percent of the structures have 1 story and 40.1 percent have 2 stories. Finally, 46.8 percent of the structures have a crawl space foundation while 37.0% have a slab foundation. Table 4-24 has the top 3 occupancy types, number of stories, and foundation types for the structures located in the Newport Beach RL areas.

Table 4-24. Summary of Structures in All Newport Beach RL Areas

	Number	Percentage
Occupancy		
Single-Family Residential	6,699	79.7%
Multi-Family Housing 2 Units	1,034	12.3%
Professional or Technical Services	211	2.5%
Stories		
1 Story	4,772	56.8%
2 Stories	3,369	40.1%
3 Stories	260	3.1%
Foundation		
Crawl Space	3,937	46.8%
Slab	3,113	37.0%
Pile	553	6.6%
Total Number of Structures	**8,406**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

4.2.2 City of Newport Beach RLA1

To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL areas around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information. Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RLA1 is shown in Figure 4-8.

There are 1,202 structures located in the RLA1 for Newport Beach. The most common occupancy type for structures in this area is single-family residential, which makes up 95.1 percent of the total structures. When looking at the number of stories, most structures are single story which makes up 80.1 percent of the total structures. Finally, the common foundation type for structures in this area is either a crawl space, which makes up 44.1 percent of the total structures, or slab foundation which makes up 41.6 percent of the total structures. Based on this data, the most common structure in this RL area is a single-family residential structure that is single story with either a crawl space or slab foundation. Table 4-25 shows the top three occupancy classes, number of stories, and foundation types for this RL area. The flooding source for this RL area is “poor local drainage.”

RLA1 of Newport Beach has 1 RL property. The occupancy type for this property is single-family residential. The structure has one story with a crawl space foundation and is 5,448.7 square feet.

Figure 4-8. Newport Beach Repetitive Loss Area 1

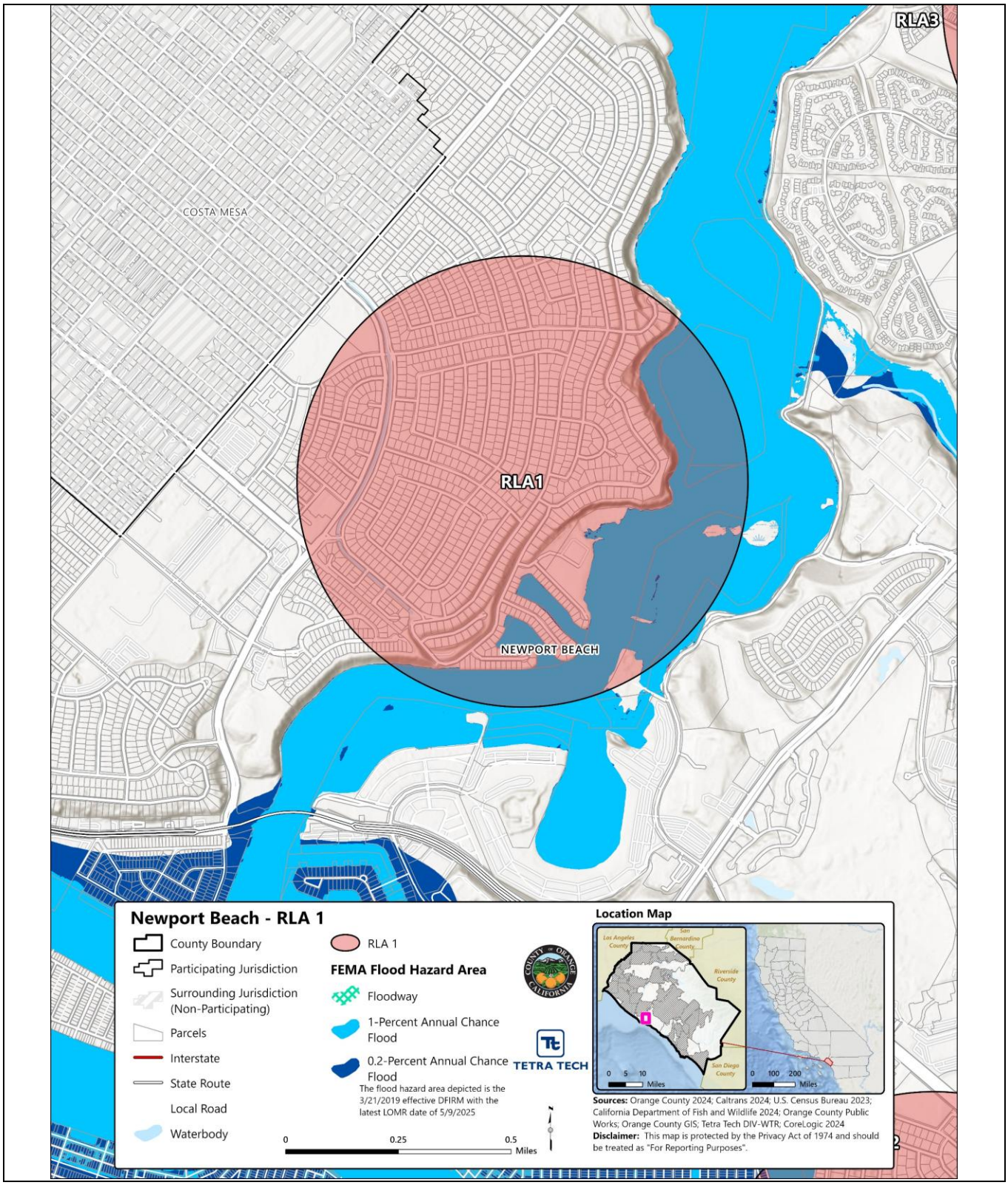


Table 4-25. Summary of Structures in Newport Beach RLA1

	Number	Percentage
Occupancy		
Single-Family Residential	1,143	95.1%
Professional or Technical Services	27	2.2%
Retail	7	0.6%
Stories		
1 Story	963	80.1%
2 Stories	238	19.8%
3 Stories	1	0.1%
Foundation		
Crawl Space	534	44.4%
Slab	500	41.6%
Basement	129	10.7%
Total Number of Structures	**1,202**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

Table 4-26. Problem Statement for Newport Beach RLA1

FEMA Repetitive Loss Property #	Problem Statement
91102	Poor Local Drainage, property lower than street

Note: Flooding source reviewed and provided by the community

Table 4-27. FEMA Identified Repetitive Loss Properties in Newport Beach RLA1

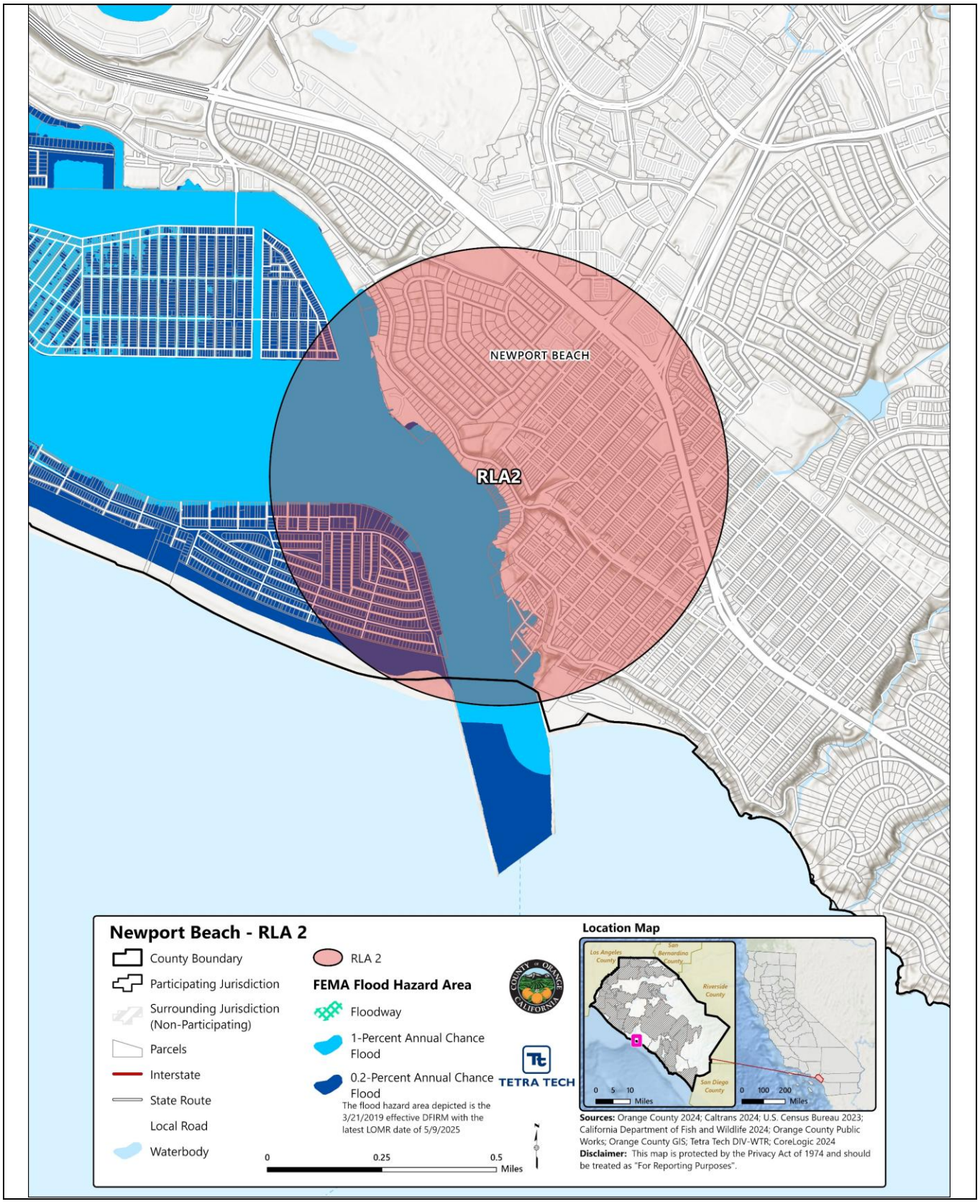
FEMA Repetitive Loss Property #	Occupancy	Stories	Foundation	Square Feet	Probable Mitigation Measures
91102	Single-Family Residential	1	Crawl Space	5,448.7	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC. Structural elevation, foundation mitigation techniques, and floodproofing considerations.

Source: FEMA/ISO; U.S. Army Corps of Engineers National Structure Inventory 2022

4.2.3 City of Newport Beach RLA2

To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL areas around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information. Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RLA2 is shown in Figure 4-9.

Figure 4-9. Newport Beach Repetitive Loss Area 2



There are 2,088 structures located in RLA 2 for Newport Beach. The most common occupancy type for this area is a single-family residential structure which makes up 80.3 percent of the total structures. When looking at the number of stories, most structures in this area are single story, which make up 54.3 percent of the total structures. Finally, the most common foundation type for this area is either a crawl space foundation which makes up 44.4% of the total structures or slab foundation, which makes up 39.8 percent of the total structures. Based on this data, the most common structures in this RL area is a single-family residential structure that is single story that has either a crawl space foundation or slab foundation. Table 4-28 shows the top three occupancy types, number of stories, and foundation types for structures in the RL area. The flooding source for this RL area is "Wave facing coastal flooding, harbor inlet."

RLA2 of Newport Beach has 1 RL property. The occupancy type for this property is single-family residential. The structure has one story with a slab foundation and is 2,813.4 square feet.

Table 4-28. Summary of Structures in Newport Beach RLA2

	Number	Percentage
Occupancy		
Single-Family Residential	1,677	80.3%
Multi-Family Housing 2 Units	194	9.3%
Professional or Technical Services	51	2.4%
Stories		
1 Story	1,133	54.3%
2 Stories	868	41.6%
3 Stories	82	3.9%
Foundation		
Crawl Space	927	44.4%
Slab	832	39.8%
Pile	141	6.8%
Total Number of Structures	**2,088**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

Table 4-29. Problem Statement for Newport Beach RLA2

FEMA Repetitive Loss Property #	Problem Statement
91122	Wave facing coastal flooding, harbor inlet

Note: Flooding source reviewed and provided by the community.

Table 4-30. FEMA Identified Repetitive Loss Properties in Newport Beach RLA2

FEMA Repetitive Loss Property #	Occupancy	Stories	Foundation	Square Feet	Probable Mitigation Measures
91122	Single-Family Residential	1	Slab	2,813.4	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC. Structural elevation, foundation mitigation techniques, and

FEMA Repetitive Loss Property #	Occupancy	Stories	Foundation	Square Feet	Probable Mitigation Measures
					floodproofing considerations.

Source: FEMA/ISO; U.S. Army Corps of Engineers National Structure Inventory 2022

4.2.4 City of Newport Beach RLA3

To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL areas around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information. Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RLA3 is shown in Figure 4-10.

There are 1,371 structures located in RLA 3 for Newport Beach. The most common occupancy type for structures in this area is single-family residential which makes up 88.4 percent of the total structures. When looking at the number of stories, most structures in this area are single story which makes up 65.4 percent. Finally, the most common foundation type for this area is either crawl space foundation, which is 47.4 percent of the total structures, or slab foundation, which makes up 38.9 percent of the total structures. Based on this data, the most common structure for this RL area is a single-family residential that is single story with either crawl space or slab foundation. Table 4-31 shows the top three occupancy types, number of stories, and foundation types for structures in this RL area. The flood source for this RL area is “Runoff from adjacent higher ground properties.”

RLA3 of Newport Beach has 1 RL property. The occupancy type for this property is single-family residential. The structure has one story with a slab foundation and is 2,640.9 square feet.

Table 4-31. Summary of Structures in Newport Beach RLA3

	Number	Percentage
Occupancy		
Single-Family Residential	1,212	88.4%
Multi-Family Housing 2 Units	71	5.2%
Professional or Technical Services	32	2.3%
Stories		
1 Story	897	65.4%
2 Stories	468	34.1%
3 Stories	6	0.4%
Foundation		
Crawl Space	650	47.4%
Slab	534	38.9%
Basement	104	7.6%
Total Number of Structures	**1,371**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

Table 4-32. Problem Statement for Newport Beach RLA3

FEMA Repetitive Loss Property #	Problem Statement
92161	Runoff from adjacent higher ground properties

Note: Flooding source reviewed and provided by the community.

Figure 4-10. Newport Beach Repetitive Loss Area 3

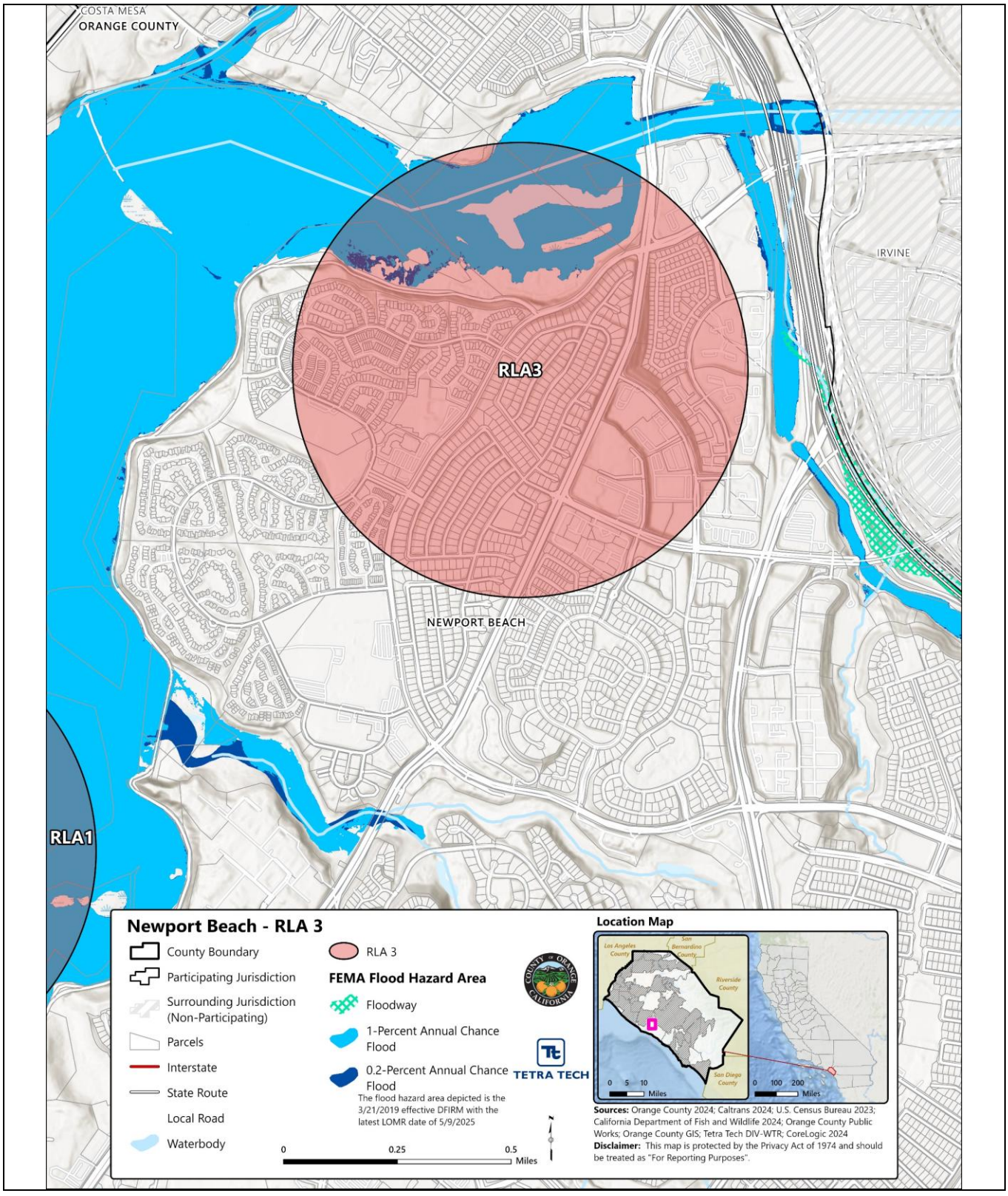


Table 4-33. FEMA Identified Repetitive Loss Properties in Newport Beach RLA3

FEMA Repetitive Loss Property #	Occupancy	Stories	Foundation	Square Feet	Flooding Source
92161	Single-Family Residential	1	Slab	2,640.9	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC. Structural elevation, foundation mitigation techniques, and floodproofing considerations.

Source: FEMA/ISO; U.S. Army Corps of Engineers National Structure Inventory 2022

4.2.5 City of Newport Beach RLA4

To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL areas around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information. Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RLA4 is shown in Figure 4-11.

There are 783 structures located in RL Area 4 of Newport Beach. The most common occupancy type for structures in this RL area is a single-family residential structure which makes up 72.4 percent of the total structures. When looking at the number of stories, most structures in this area are 2 stories, which make up 60.5 percent of the total structures. Finally, the most common foundation for structures in this area is a crawl space foundation, which makes up 48.0 percent of the total structures. Based on this data, the most common structure for this RL area is a single-family residential structure that is 2 stories with a crawl space foundation type. Table 4-34 shows the top three occupancy types, number of stories, and foundation types for structures in this RL area. The flood source for this RL area is “Water accumulation in downstream half of alley, garages near street level”, which suggests poor local drainage.

RLA4 of Newport Beach has 1 RL property. The occupancy type for this property is single-family residential. The structure has two stories with a crawl space foundation and is 4,081.5 square feet.

Table 4-34. Summary of Structures in Newport Beach RLA4

	Number	Percentage
Occupancy		
Single-Family Residential	567	72.4%
Multi-Family Housing 2 Units	152	19.4%
Professional or Technical Services	19	2.4%
Stories		
2 Stories	474	60.5%
1 Story	299	38.2%
3 Stories	10	1.3%

	Number	Percentage
Foundation		
Crawl Space	376	48.0%
Slab	244	31.2%
Pile	81	10.3%
Total Number of Structures	**783**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

Figure 4-11. Newport Beach Repetitive Loss Area 4

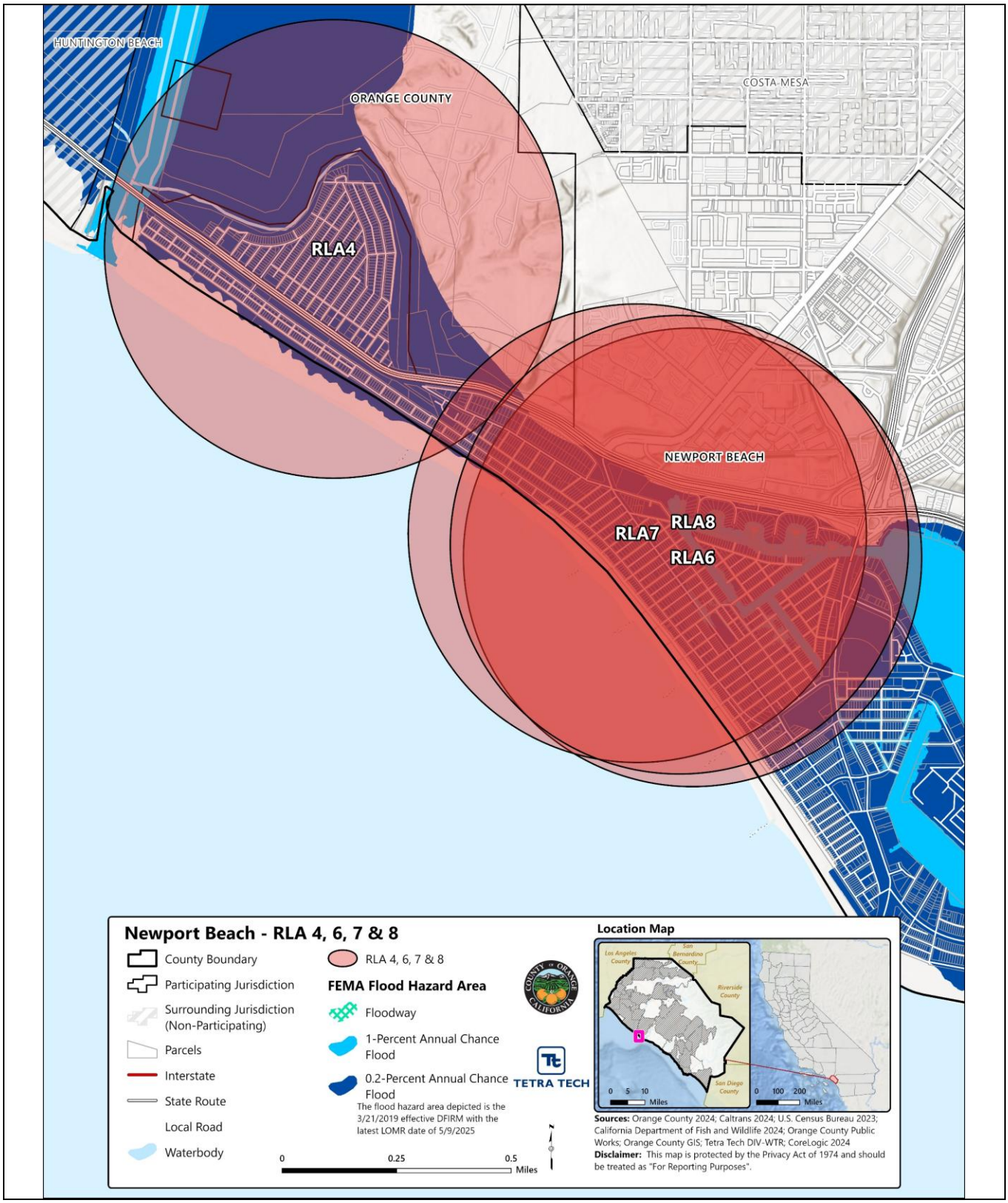


Table 4-35. Problem Statement for Newport Beach RLA4

FEMA Repetitive Loss Property #	Problem Statement
93881	Water accumulation in downstream half of ally. Garages near street level.

Note: Flooding source reviewed and provided by the community.

Table 4-36. FEMA Identified Repetitive Loss Properties in Newport Beach RLA4

FEMA Repetitive Loss Property #	Occupancy	Stories	Foundation	Square Feet	Probable Mitigation Measures
93881	Single-Family Residential	2	Crawl Space	4,081.5	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC. Structural elevation, foundation mitigation techniques, and floodproofing considerations.

Source: FEMA/ISO; U.S. Army Corps of Engineers National Structure Inventory 2022

4.2.6 City of Newport Beach RLA5

To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL areas around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information. Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RLA5 is shown in Figure 4-12.

There are 829 structures located in the RLA5 area of Newport Beach. The most common occupancy type for structures in this RL area is single-family residential, which makes up 95.8 percent of the total structures. When looking at the number of stories, most structures in this area are 2 stories. Finally, the most common foundation type for structures in this area is either a slab foundation, which makes up 44.3% of the total structures, or crawl space foundation, which makes up 43.2 percent of the total structures. Based on this data, the most common structure for this RL area is a single-family residential that is 2 stories with either a slab foundation or crawl space foundation. Table 4-37 shows the top three occupancy types, number of stories, and the foundation types for structures in this RL area. The flooding source for this RL area is “Poor local drainage, property lower than street.” This suggests poor local drainage.

RLA5 of Newport Beach has 1 RL property. This structure is a single-family residential structure with a total square footage of 1,913 square feet. The number of stories and foundation type for this structure is not publicly available on the tax assessor site.

Figure 4-12. Newport Beach Repetitive Loss Area 5

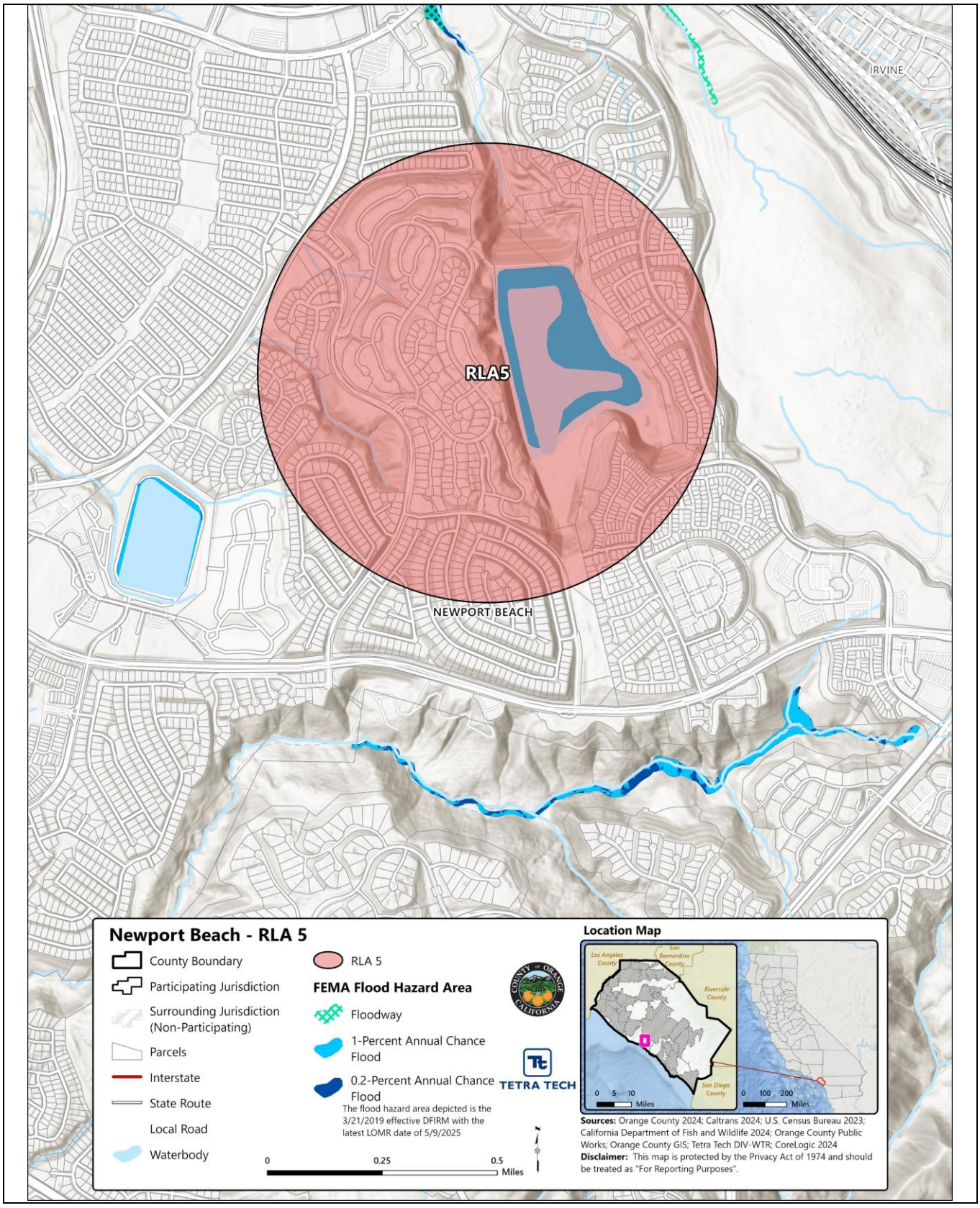


Table 4-37. Summary of Structures in Newport Beach RLA5

	Number	Percentage
Occupancy		
Single-Family Residential	794	95.8%
Professional or Technical Services	18	2.2%
Multi-Family Housing 3-4 Units	4	0.5%
Stories		
2 Stories	523	63.1%
1 Story	183	22.1
3 Stories	123	14.8%
Foundation		
Slab	367	44.3%
Crawl Space	358	43.2%
Basement	104	12.5%
Total Number of Structures	**829**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

Table 4-38. Problem Statement for Newport Beach RLA5

FEMA Repetitive Loss Property #	Problem Statement
127946	Poor local drainage, property lower than street.

Note: Flooding source reviewed and provided by the community.

Table 4-39. FEMA Identified Repetitive Loss Properties in Newport Beach RLA5

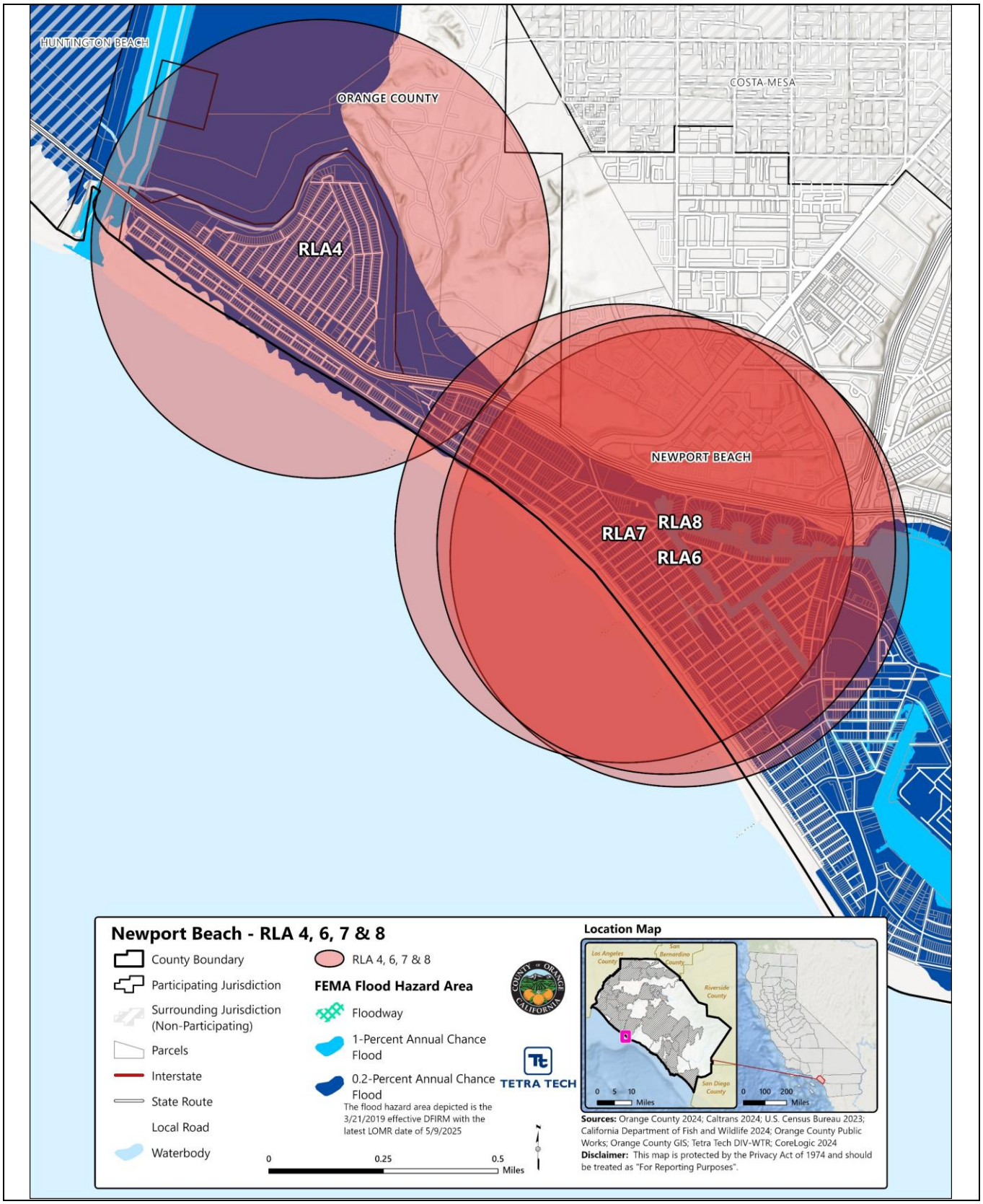
FEMA Repetitive Loss Property #	Occupancy	Stories	Foundation	Square Feet	Probable Mitigation Measures
127946	Single-family residential	*Slab on grade	Unknown	1,913	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC. Structural elevation, foundation mitigation techniques, and floodproofing considerations.

Source: FEMA/ISO; U.S. Army Corps of Engineers National Structure Inventory 2022
*Unable to confirm foundation type from public data sources. From photo assessment, the foundation type assumption is slab on grade

4.2.7 City of Newport Beach RLA6

To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL areas around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information. Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RLA6 is shown in Figure 4-13.

Figure 4-13. Newport Beach Repetitive Loss Area 6



There are 2,074 structures located in RLA6 for Newport Beach. The most common occupancy type for structures in this area is single-family residential, which makes up 61.7 percent of the total structures. When looking at the number of numbers, most structures in this area are single story, which make up 61.1 percent. Finally, the most common foundation type for structures in this area is a crawl space foundation which makes up 51.2 percent. Based on this data, the most common structures in this RL area is a single-family residential structure that is single story and has a crawl space foundation. Table 4-40 shows the top three occupancy types, number of stories, and foundation types for structures in this RL area. The flooding source for this RL area is "Garages near street level near drains to bay" which suggests the area is a low point with poor drainage.

RLA6 of Newport Beach has one RL property. The occupancy type for this property is multi-family housing two units. The structure has one story with a slab foundation and is 1,828.4 square feet.

Table 4-40. Summary of Structures in Newport Beach RLA6

	Number	Percentage
Occupancy		
Single-Family Residential	1,280	61.7%
Multi-Family Housing 2 Units	589	28.4%
Professional or Technical Services	61	2.9%
Stories		
1 Story	1,267	61.1%
2 Stories	771	37.2%
3 Stories	36	1.7%
Foundation		
Crawl Space	1,062	51.2%
Slab	617	29.7%
Pile	243	11.7%
Total Number of Structures	**2,074**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

Table 4-41. Problem Statement for Newport Beach RLA6

FEMA Repetitive Loss Property #	Problem Statement
138089	Garages near street level near drains to bay.

Note: Flooding source reviewed and provided by the community.

Table 4-42. FEMA Identified Repetitive Loss Properties in Newport Beach RLA6

FEMA Repetitive Loss Property #	Occupancy	Stories	Foundation	Square Feet	Probable Mitigation Measures
138089	Multi-Family housing 2 units	1	Slab	1,828.4	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC. Structural elevation, foundation mitigation techniques, and floodproofing considerations.

Source: FEMA/ISO; U.S. Army Corps of Engineers National Structure Inventory 2022

4.2.8 City of Newport Beach RLA7

To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL areas around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information. Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RLA7 is shown in Figure 4-14.

There are 1,962 structures located in RLA 7 for Newport Beach. The most common occupancy type for structures in this area is single-family residential, which makes up 64.8 percent of the total structures. When looking at the number of stories, most structures in this area are single story which makes up 60.4 percent of the total structures. Finally, the most common foundation for structures in this area is a crawl space foundation which makes up 52.1 percent of the total structures. Table 4-43 shows the top three occupancy types, number of stories, and foundation types for structures in the RL area. The flooding source for this RL area is “Low area around storm drains.”

RLA7 of Newport Beach has 1 RL property. The occupancy type for this property is single-family residential. The structure has one story with a crawl space foundation and is 1,362.7 square feet.

Table 4-43. Summary of Structures in Newport Beach RLA7

	Number	Percentage
Occupancy		
Single-Family Residential	1,271	64.8%
Multi-Family Housing 2 Units	579	29.5%
Professional or Technical Services	35	1.8%
Stories		
1 Story	1,186	60.4%
2 Stories	741	37.8%
3 Stories	35	1.8%
Foundation		
Crawl Space	1,023	52.1%
Slab	563	28.7%
Pile	234	11.9%
Total Number of Structures	**1,962**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

Table 4-44. Problem Statement for Newport Beach RLA7

FEMA Repetitive Loss Property #	Problem Statement
138176	Low area around storm drains.

Note: Flooding source reviewed and provided by the community.

Figure 4-14. Newport Beach Repetitive Loss Area 7

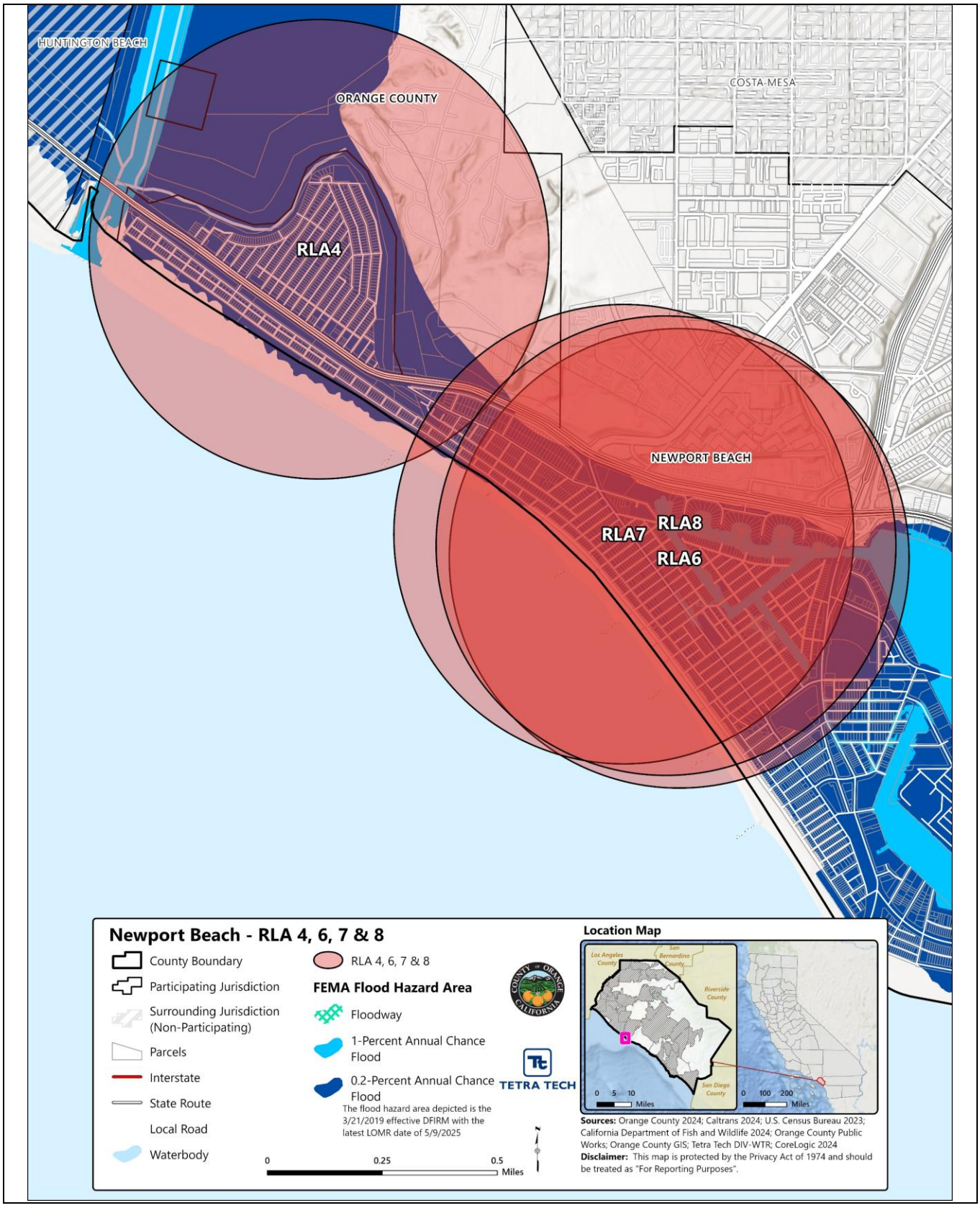


Table 4-45. FEMA Identified Repetitive Loss Properties in Newport Beach RLA7

FEMA Repetitive Loss Property #	Occupancy	Stories	Foundation	Square Feet	Probable Mitigation Measures
138176	Single-Family Residential	1	Crawl Space	1,362.7	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC. Structural elevation, foundation mitigation techniques, and floodproofing considerations.

Source: FEMA/ISO; U.S. Army Corps of Engineers National Structure Inventory 2022

4.2.9 City of Newport Beach RLA8

To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL areas around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information. Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RLA8 is shown in Figure 4-15.

There are 2,021 structures located in RLA8 for Newport Beach. The most common occupancy type for structures in this area is single-family residential, which makes up 62.1 percent of the total structures. When looking at the number of stories, most structures are single story, which makes up 60.8 percent of the total structures. Finally, the most common foundation for structures in this area is a crawl space foundation, which makes up 51.7 percent of the total structures. Table 4-46 shows the top three occupancy types, number of stories, and foundation types for structures in this RL area. The flood source for this RL area is “garages near street level drains to bay.” This suggests the area is a low point near a drain that leads to the nearby bay.

RLA8 of Newport Beach has 1 RL property. The occupancy type for this property is single-family residential. The structure has two stories with a slab foundation and is 3,748.9 square feet.

Table 4-46. Summary of Structures in Newport Beach RLA8

	Number	Percentage
Occupancy		
Single-Family Residential	1,256	62.1%
Multi-Family Housing 2 Units	594	29.4%
Professional or Technical Services	49	2.4%
Stories		
1 Story	1,229	60.8%
2 Stories	759	37.6%
3 Stories	33	1.6%
Foundation		
Crawl Space	1,045	51.7%
Slab	593	29.3%

	Number	Percentage
Pile	237	11.7%
Total Number of Structures	**2,021**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

Figure 4-15. Newport Beach Repetitive Loss Area 8

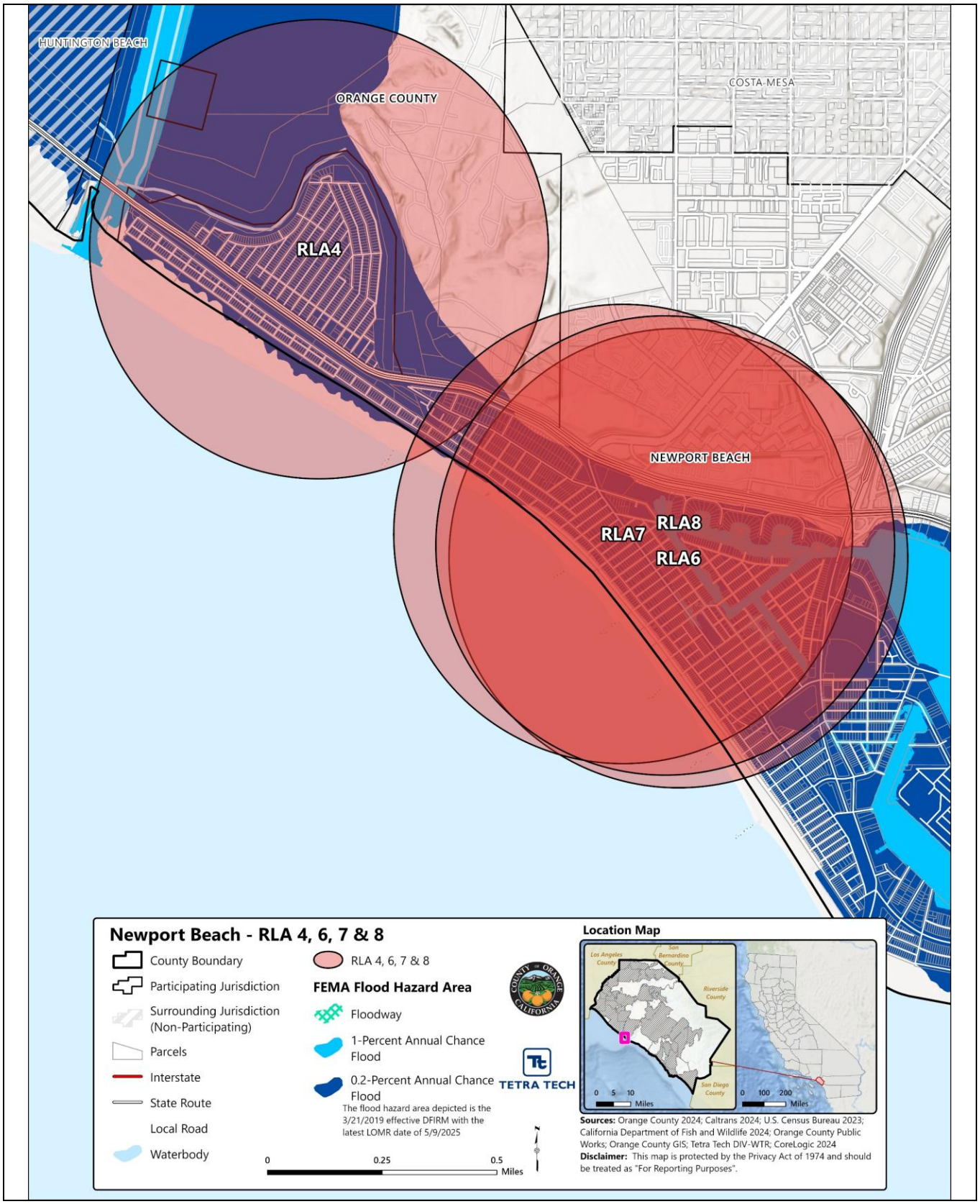


Table 4-47. Problem Statement for Newport Beach RLA8

FEMA Repetitive Loss Property #	Problem Statement
235973	Garages near street drains to bay.

Note: Flooding source reviewed and provided by the community.

Table 4-48. FEMA Identified Repetitive Loss Properties in Newport Beach RLA8

FEMA Repetitive Loss Property #	Occupancy	Stories	Foundation	Square Feet	Probable Mitigation Measures
235973	Single-Family Residential	2	Slab	3,748.9	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC. Structural elevation, foundation mitigation techniques, and floodproofing considerations.

Source: FEMA/ISO; U.S. Army Corps of Engineers National Structure Inventory 2022

4.3 CITY OF SAN JUAN CAPISTRANO

The City of San Juan Capistrano has one RL property based on 2023 FEMA RL data, located in one RL area. Table 4-49 summarizes the claims history for the RL property. To identify the RL area, a half-mile buffer was applied to the RL property and structures within the buffers were included. The City maintains the RL inventory and maps following PII standards.

Tetra Tech, in partnership with the City, reviewed the RL area against the community's Activity 502 RL flooding source determinations. The RLAA problem statement listed in Table 4-50 aligns with the City's individual assessment of the flooding sources in the RL areas.

It was determined that the City's existing RL area mailing list meets the program criteria for CRS Activity 510 (Repetitive Loss Area Annual Mailer).

Table 4-49. RL Claim History in San Juan Capistrano

FEMA RL Number ID	RL Area	Mitigated	Cumulative Building Payment	Cumulative Contents Payment	Total Losses	Total Paid	NFIP Repetitive Loss Flag
197080	RLA1	NO	$22779.33	$2489.63	2	$25268.96	YES

FEMA RL Data as of November 27, 2023

Table 4-50. RL Area Problem Statements for San Juan Capistrano

RL Area	FEMA RL Number ID	Problem Statement
RLA1	91102	Hillside slope flooding

4.3.1 City of San Juan Capistrano RL Area 1

To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL areas around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information. Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RL Area 1 is shown in Figure 4-16.

There are 922 structures located in RL Area 1 for San Juan Capistrano. The most common occupancy type for this area is single family residential, which makes up 86.2 percent of the total structures. Structures in this area are single-story, which is 95.7 percent of the total structures. The most common foundation type in this area is either crawl space which is 45.6 percent of the total structures or slab foundation which is 42.7 percent of the total structures. These results suggest that the common characteristics for the structures in the RL area are a single-story single-family structure on either a crawl space or slab foundation type. Table 4-51 lists the top three occupancy types, number of stories, and foundation for this RL area. The flooding source for this RL area is "Hillside slope flooding."

RL Area 1 of San Juan Capistrano has 1 repetitive loss property. This structure is a single-family residential structure with a crawl space foundation. The structure is 1 story with a total area of 6,414.2 square feet.

Table 4-51. Summary of Structures in San Juan Capistrano RLA1

	Number	Percentage
Occupancy		
Single-Family Residential	795	86.2%
Multi-Family Housing 3-4 Units	44	4.8%
Multi-Family Housing 2 Units	38	4.1%
Stories		
1 Story	882	95.7%
2 Stories	39	4.2%
3 Stories	1	0.1%
Foundation		
Crawl Space	420	45.6%
Slab	394	42.7%
Basement	108	11.7%
Total Number of Structures	**922**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

Table 4-52. Problem Statement for San Juan Capistrano RLA1

FEMA Repetitive Loss Property #	Problem Statement
197080	Hillside slope flooding

Note: flooding source reviewed and provided by the community.

Figure 4-16. San Juan Capistrano Repetitive Loss Area 1a

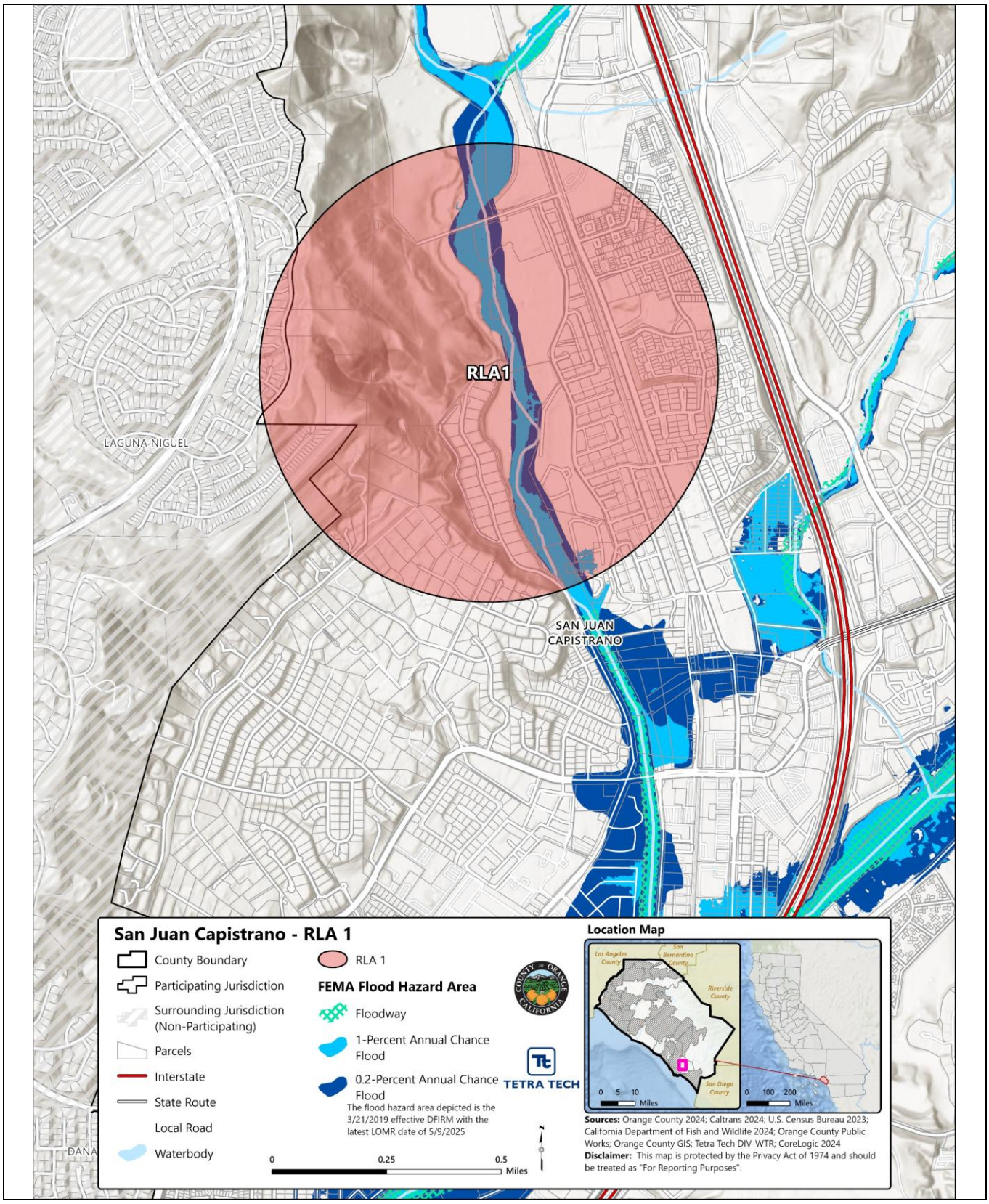


Table 4-53. FEMA Identified Repetitive Loss Properties in San Juan Capistrano RLA1

FEMA Repetitive Loss Property #	Occupancy	Stories	Foundation	Square Feet	Probable Mitigation Measure
197080	Single-Family Residential	1	Crawl Space	6,414.2	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC. Structural elevation, foundation mitigation techniques, and floodproofing considerations.

Source: FEMA/ISO; U.S. Army Corps of Engineers National Structure Inventory 2022

4.4 CITY OF SANTA ANA

The City of Santa Ana has 13 RL properties in 6 RL areas. Table 4-54 summarizes the claims history for the RL properties. To identify RL areas, a half-mile buffer was applied to the RL properties and structures within the buffers were included. The City maintains the RL inventory and maps following PII standards.

The City of Santa Ana does not currently participate in FEMA's Community Rating System program. For reporting purposes, the NFIP RL data was presented, and best available data was discussed with the City. The City reviewed the RL inventory and problem statements listed in Table 4-55 to complete the RL area assessment. Should the City apply for the CRS program, the RLAA may be utilized for potential credit following the credit criteria in place at the time of their CRS application. This data may also support action items listed in the current Hazard Mitigation Plan.

Table 4-54. RL Claim History in Santa Ana

FEMA RL Number ID	RL Area	Mitigated	Cumulative Building Payment	Cumulative Contents Payment	Total Losses	Total Paid	NFIP Repetitive Loss Flag
70319	RLA1	NO	$4030.52	$0.00	2	$4030.52	YES
71254	RLA2	NO	$25163.76	$0.00	2	$25163.76	YES
91774	RLA3	NO	$35335.64	$3381.27	2	$38716.91	YES
97065	RLA4	NO	$27672.05	$0.00	3	$27672.05	YES
137791	RLA5	NO	$17758.72	$0.00	3	$17758.72	YES
302779	RLA6	NO	$7912.94	$0.00	2	$7912.94	YES

FEMA RL Data as of November 27, 2023

Table 4-55. RL Area Problem Statements for Santa Ana

RL Area	FEMA RL Number ID	Problem Statement
RLA1	70319	Poor storm drain drainage at corner. Drains look upgraded and issue mitigated.
RLA2	71254	Property at low elevation where streets drain to adjacent storm channel.

RL Area	FEMA RL Number ID	Problem Statement
RLA3	91774	Property is adjacent to flood channel. Perhaps backwater of channel overtopping to adjacent properties.
RLA4	97065	Runoff from adjacent higher ground properties.
RLA5	137791	Property is adjacent to flood channel. Perhaps backwater of channel overtopping to adjacent properties.
RLA6	302779	Flooding from Adjacent higher properties and poor property drainage.

4.4.1 City of Santa Ana RL Area Structures

There are 5,804 structures located in the 6 RL areas for Santa Ana. When looking at the overall occupancy type for the structures in the RL areas, the majority of the structures are single-family residential structures, which make up 83.9 percent of the structures. For the number of stories, the majority of the structures are single story, which make up 95.0 percent of the structures. Finally, 45.7 percent of the structures have a crawl space foundation while 36.7 percent of the structures have a slab foundation. Table 4-56 shows the top three occupancy types, number of stories, and foundation types for the structures located in the Santa Ana RL areas.

Table 4-56. Summary of All Structures in Santa Ana RL Areas

	Number	Percentage
Occupancy		
Single-Family Residential	4,868	83.9%
Multi-Family Housing 2 Units	228	3.9%
Manufactured Home	201	3.5%
Stories		
1 Story	5,512	95.0%
2 Stories	277	4.8%
3 Stories	13	0.2%
Foundation		
Crawl Space	2,652	45.7%
Slab	2,128	36.7%
Pile	469	8.1%
Total Number of Structures	**5,804**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

4.4.2 City of Santa Ana RLA1

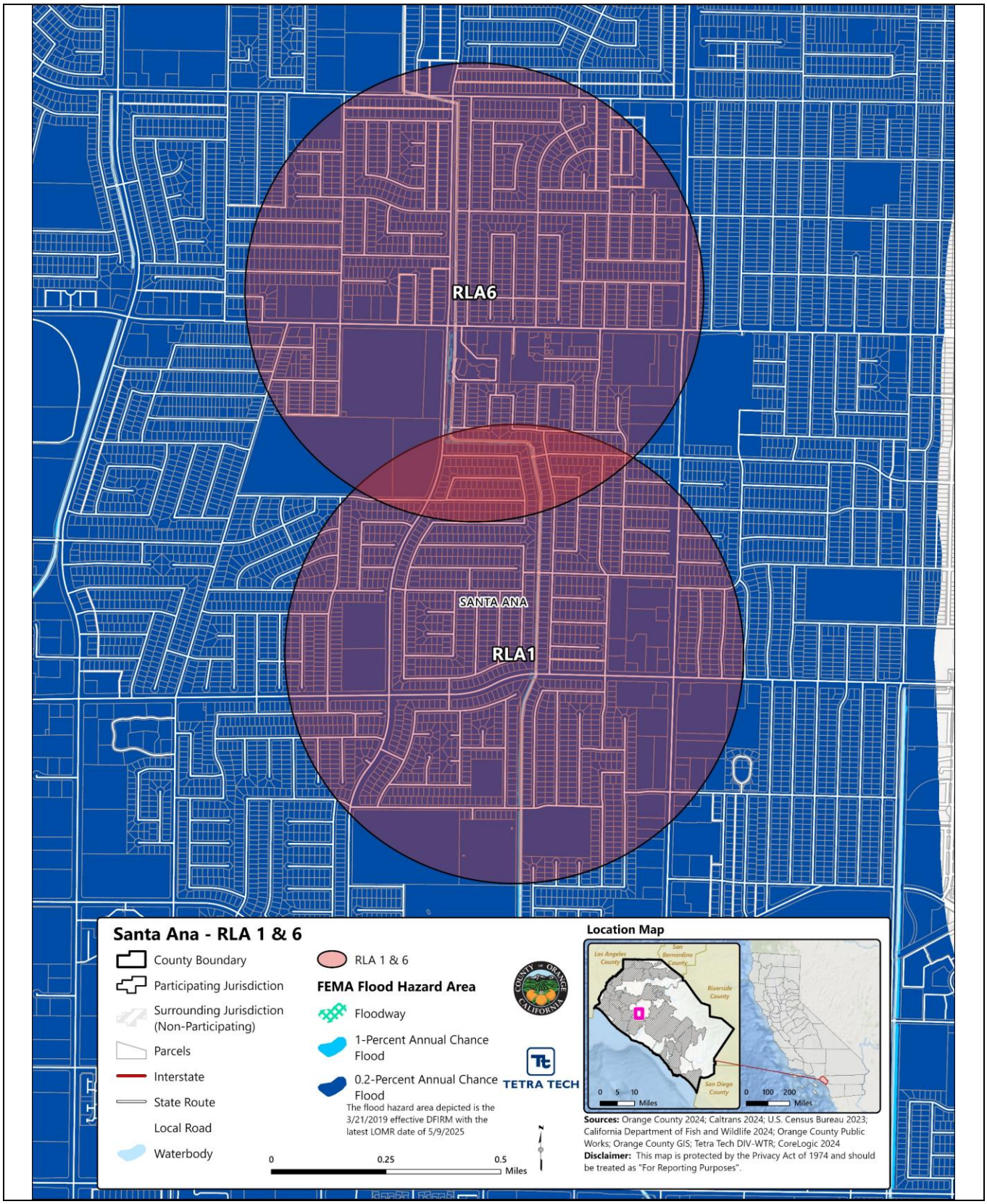
To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL areas around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information. Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RLA1 is shown in Figure 4-17.

There are 1,966 structures located in the RL Area 1 for Santa Ana. The most common occupancy type for structures in this area is single-family residential, which makes up 92.8 percent of the total structures. When looking at the number of stories, most structures in the area are single story. Finally, the most common foundation type for structures in this area are crawl space which is 44.3 percent of the total structures or slab foundation which is 38.1 percent of the total structure. Based on this data, the most common structures in this RL area is single-family residential that is single story with either a crawl space or slab foundation. Table

Table 4-57 shows the top three occupancy types, number of stories, and foundation type for this RL area. The flooding source for this RL Area is “Poor storm drain drainage at corner. Drains look upgraded and issue mitigated.”

RLA1 of Santa Ana has 1 RL property. The occupancy type for this property is single-family residential. The structure has one story with a crawl space foundation and is 3,268.7 square feet.

Figure 4-17. Santa Ana Repetitive Loss Area 1



Table

Table 4-57. Summary of Structures in Santa Ana RLA1

	Number	Percentage
Occupancy		
Single-Family Residential	1,825	92.8%
Multi-Family Housing 3-4 Units	40	2.0%
Professional or Technical Services	30	1.5%
Stories		
1 Story	1,911	97.2%
2 Stories	54	2.7%
3 Stories	1	0.1%
Foundation		
Crawl Space	871	44.3%
Slab	750	38.1%
Pier	138	7.0%
Total Number of Structures	**1,966**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

Table 4-58. Problem Statement for Santa Ana RLA1

FEMA Repetitive Loss Property #	Problem Statement
70319	Poor storm drain drainage. Drains look upgraded and issue mitigated.

Note: flooding source reviewed and provided by the community.

Table 4-59. FEMA Identified Repetitive Loss Properties in Santa Ana RLA1

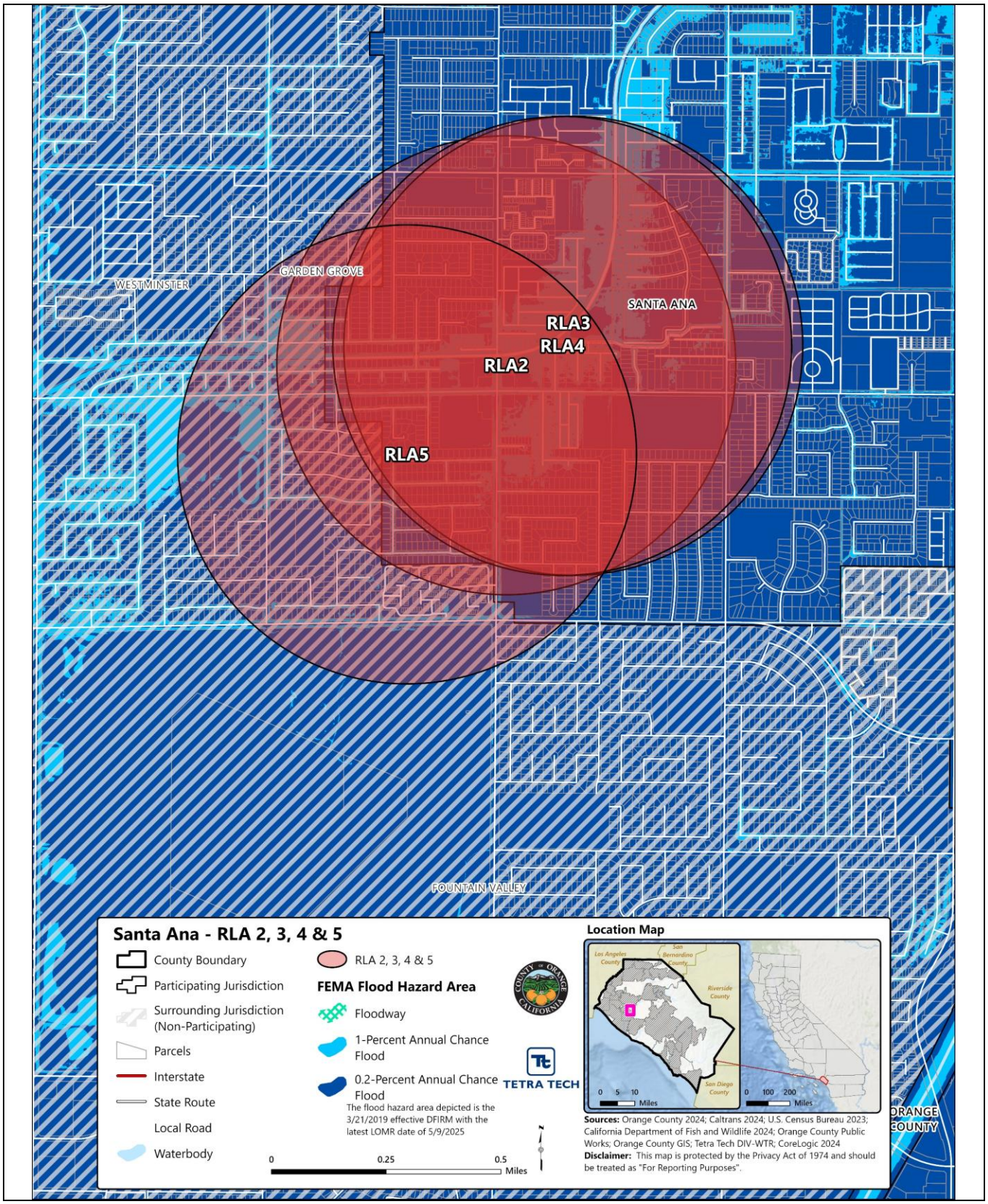
FEMA Repetitive Loss Property #	Occupancy	Stories	Foundation	Square Feet	Probable Mitigation Measures
70319	Single-Family Residential	1	Crawl Space	3,268.7	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC. Structural elevation, foundation mitigation techniques, and floodproofing considerations.

Source: FEMA/ISO; U.S. Army Corps of Engineers National Structure Inventory 2022

4.4.3 City of Santa Ana RLA2

To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information. Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RLA2 is shown in Figure 4-18.

Figure 4-18. Santa Ana Repetitive Loss Area 2



There are a total of 1,664 structures located in RL Area 2 for Santa Ana. The most common occupancy type for structures in the area is single-family residential structures which make up 84.0 percent of the total structures. When looking at the number of stories, most structures in this area are single story, which make up 93.3 percent of the total structures. Finally, the most common foundation type is crawl space. Based on this data, the most common structure in this RL area is a single-family residential structure that is single story and has a crawl space foundation. Table 4-60 shows the top three occupancy types, number of stories, and foundation types for this RL area. The flooding source for this RL area is "poor storm drain drainage at corner. Drains look upgraded and issue mitigated" and "Property at low elevation where streets drain to adjacent storm channel" which suggests poor drainage.

RLA2 of Santa Ana has two RL properties. The occupancy type for property 70319 is single-family residential with one story on a crawl space foundation. This property is a total of 3,268.7 square feet. Property 71254 is a multi-family residential unit structure with a total of 1,217 square feet for the unit. The number of stories and foundation type are not publicly accessible on the tax assessor website.

Table 4-60. Summary of Structures in Santa Ana RLA2

	Number	Percentage
Occupancy		
Single-Family Residential	1,398	84.0%
Manufacture Home	75	4.5%
Multi-Family Housing 2 Units	67	4.0%
Stories		
1 Story	1,553	93.3%
2 Stories	107	6.4%
3 Stories	2	0.1%
Foundation		
Crawl Space	799	48.0%
Slab	553	33.2%
Pile	158	9.5%
Total Number of Structures	**1,664**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

Table 4-61. Problem Statement for Santa Ana RLA2

FEMA Repetitive Loss Property #	Problem Statement
71254	Property at low elevation where streets drain to adjacent storm channel

Note: flooding source reviewed and provided by the community.

Table 4-62. FEMA Identified Repetitive Loss Properties in Santa Ana RLA2

FEMA Repetitive Loss Property #	Occupancy	Stories	Foundation	Square Feet	Probable Mitigation Measures
71254	Multi-family Residential	*Slab on grade	Unknown	1,217	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC.

FEMA Repetitive Loss Property #	Occupancy	Stories	Foundation	Square Feet	Probable Mitigation Measures
					Structural elevation, foundation mitigation techniques, and floodproofing considerations.

Source: FEMA/ISO; U.S. Army Corps of Engineers National Structure Inventory 2022
*Unable to confirm foundation type from public data sources. From photo assessment, the foundation type assumption is slab on grade

4.4.4 City of Santa Ana RLA3

To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL areas around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information. Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RLA3 is shown in Figure 4-19.

There are a total of 1,986 structures located in RLA3 for Santa Ana. The most common occupancy type for this area is single-family residential which makes up 73.6 percent of the structures. When looking at the number of stores, most structures in this area are single story which makes up 92.5 percent of the total structures. Finally, the most common foundation is crawl space, which makes up 47.5 percent of the total structures. This data suggests that the most common structure in this RL area are single-family residential structures that are single story with a crawl space foundation. Table 4-63 shows the top three occupancy types, number of stories, and foundation types for this RL area. The flooding source for this RL Area is “Property adjacent to flood channel. Perhaps backwater of channel overtopping to adjacent properties.”

RLA3 of Santa Ana has 1 RL property. The occupancy type for this property is single-family residential. The structure has one story with a slab foundation and is 2,733.2 square feet.

Table 4-63. Summary of Structures in Santa Ana RLA3

	Number	Percentage
Occupancy		
Single-Family Residential	1,462	73.6%
Manufactured Home	201	10.1%
Multi-Family Housing 2 Units	168	8.5%
Stories		
1 Story	1,838	92.5%
2 Stories	141	7.1%
3 Stories	5	0.3%
Foundation		
Crawl Space	944	47.5%
Slab	661	33.3%
Pile	197	9.9%
Total Number of Structures	**1,986**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

Figure 4-19. Santa Ana Repetitive Loss Area 3

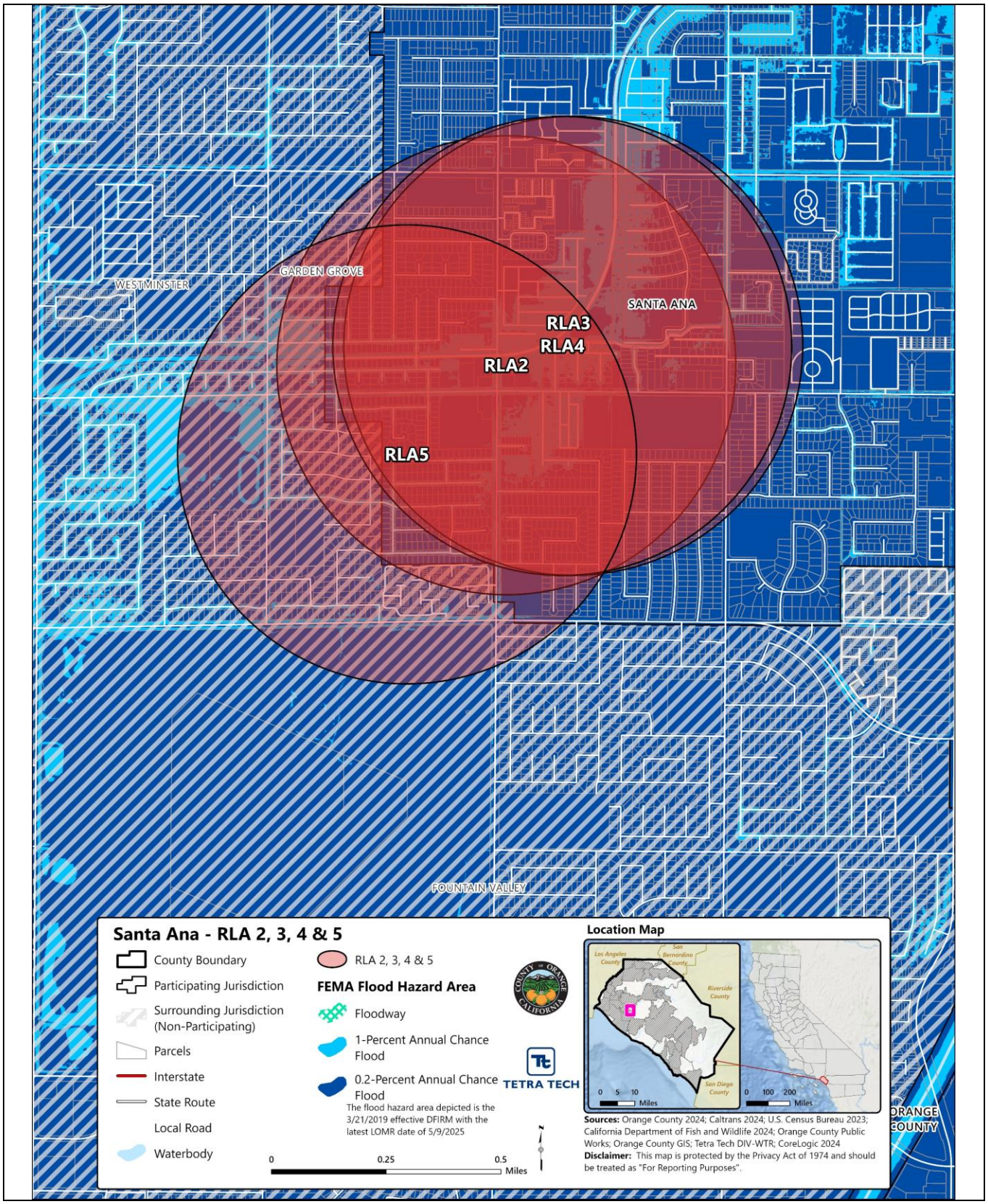


Table 4-64. Problem Statement for Santa Ana RLA3

FEMA Repetitive Loss Property #	Problem Statement
91774	Property is adjacent to flood channel. Perhaps backwater of channel overtopping to adjacent properties.

Note: flooding source reviewed and provided by the community.

Table 4-65. FEMA Identified Repetitive Loss Properties in Santa Ana RLA3

FEMA Repetitive Loss Property #	Occupancy	Stories	Foundation	Square Feet	Probable Mitigation Measures
91774	Single-Family Residential	1	Slab	2,733.2	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC. Structural elevation, foundation mitigation techniques, and floodproofing considerations.

Source: FEMA/ISO; U.S. Army Corps of Engineers National Structure Inventory 2022

4.4.5 City of Santa Ana RLA4

To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL areas around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information. Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RLA4 is shown in Figure 4-20.

There are a total of 1,950 structures located in RLA4 for Santa Ana. The most common occupancy type for this area is single-family residential, which makes up 75.4 percent of the total structures. When looking at the number of stories, most structures in this area are single story, which makes up 92.5 percent of the total structures. Finally, the most common foundation type for structures in this area is a crawl space which makes up 48.1 percent. Based on this data, the most common structure in this RL area is a single-family residential structure that is single story with a crawl space foundation. Table 4-66 shows the top three occupancy types, number of stories, and the foundation types of this RL area. The flooding source for this RL area is “Property adjacent to flood channel. Perhaps backwater of channel overtopping to adjacent properties.”

RLA4 of Santa Ana has one RL property. The occupancy type for this property is single-family residential. The structure has one story with a slab foundation and is 2,804.0 square feet.

Figure 4-20. Santa Ana Repetitive Loss Area 4

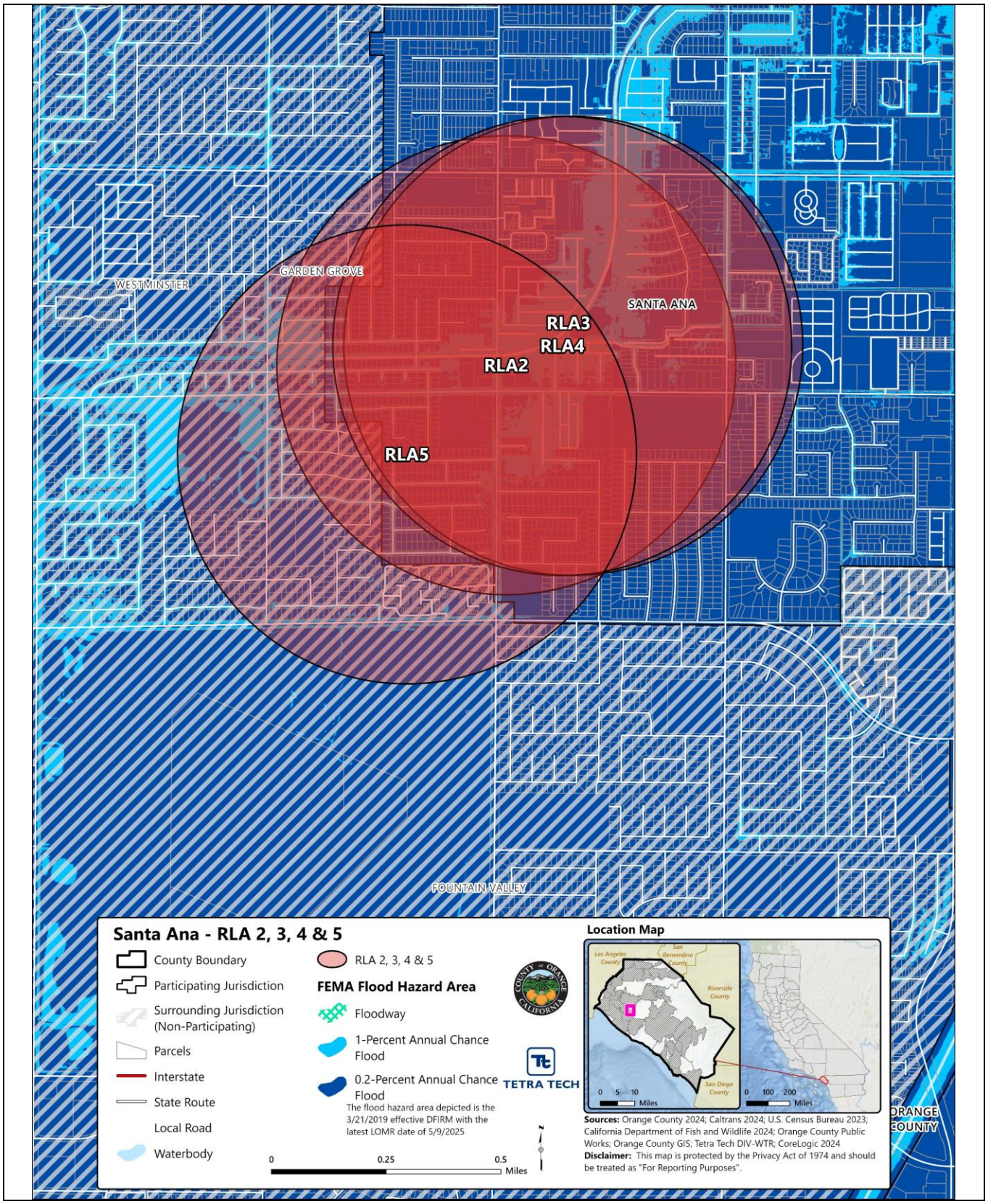


Table 4-66. Summary of Structures in Santa Ana RLA4

	Number	Percentage
Occupancy		
Single-Family Residential	1,470	75.4%
Multi-Family Housing 2 Unit	166	8.5%
Manufactured Home	162	8.3%
Stories		
1 Story	1,803	92.5%
2 Stories	140	7.2%
3 Stories	5	0.3%
Foundation		
Crawl Space	937	48.1%
Slab	640	32.8%
Pile	194	9.9%
Total Number of Structures	**1,950**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

Table 4-67. Problem Statement for Santa Ana RLA4

FEMA Repetitive Loss Property #	Problem Statement
97065	Property is adjacent to flood channel. Perhaps backwater of channel overtopping to adjacent properties.

Note: flooding source reviewed and provided by the community.

Table 4-68. FEMA Identified Repetitive Loss Properties in Santa Ana RLA4

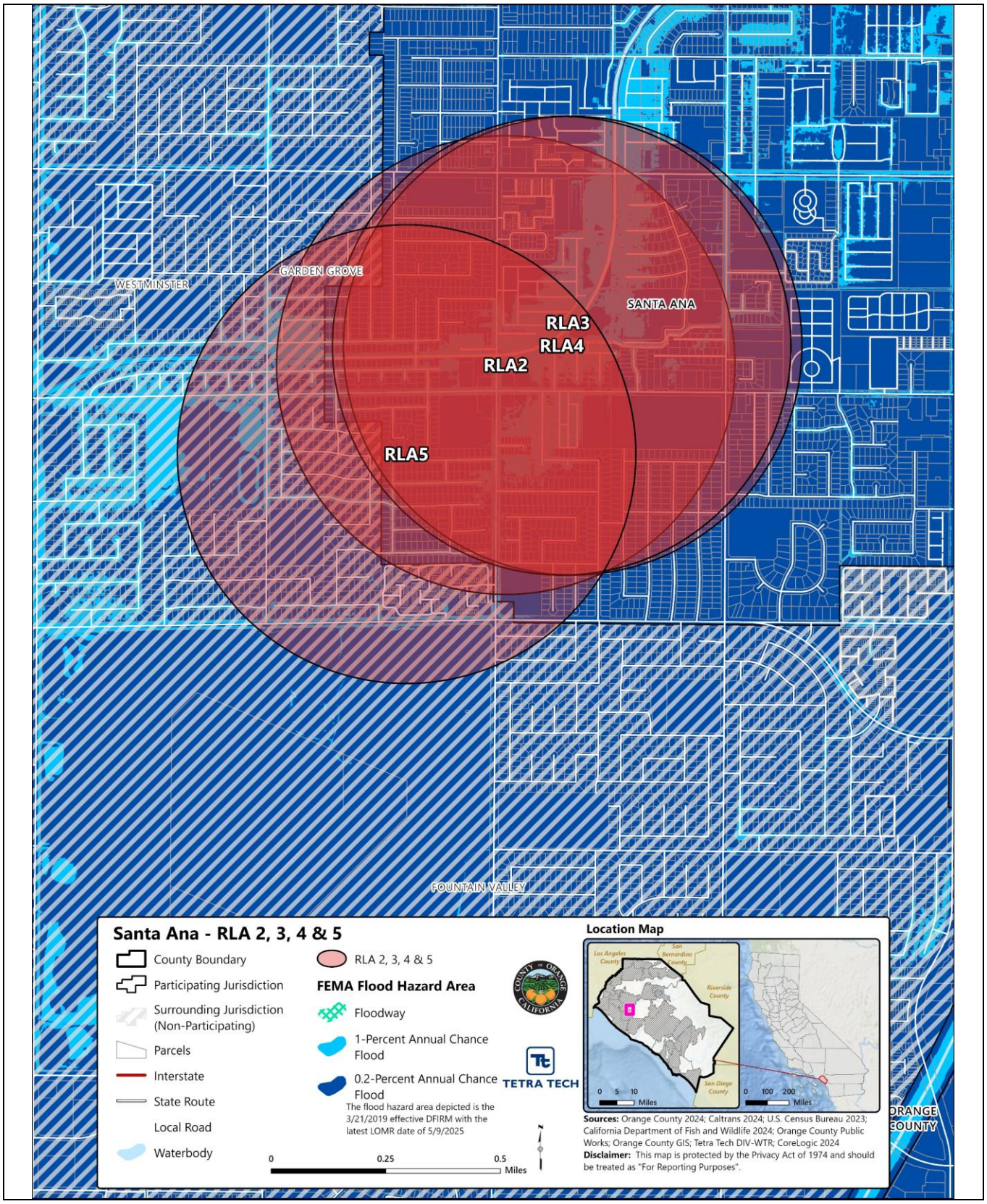
FEMA Repetitive Loss Property #	Occupancy	Stories	Foundation	Square Feet	Probable Mitigation Measures
97065	Single-Family Residential	1	Slab	2,804.0	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC. Structural elevation, foundation mitigation techniques, and floodproofing considerations.

Source: FEMA/ISO; U.S. Army Corps of Engineers National Structure Inventory 2022

4.4.6 City of Santa Ana RLA5

To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL areas around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information (PII). Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RLA5 is shown in Figure 4-21.

Figure 4-21. Santa Ana Repetitive Loss Area 5



There are a total of 1,138 structures located in RLA 5 for Santa Ana. The most common occupancy type for structures in this area is single-family residential, which makes up 86.8 percent of the total structures. When looking at the number of stories, most structures in this area are single story, which makes up 93.9 percent of the total structures. Finally, the most common foundation type for structures in this area is crawl space which makes up 47.6 percent of the total structures. Based on this data, the most common structure in this area is a single-family residential structure that is single story with a crawl space foundation. Table 4-69 shows the top three occupancy types, number of stories, and foundation types for structures in this RL area. The flooding source for this RL Area is "flooding from adjacent higher properties and poor property drainage" which suggests poor drainage.

RLA5 of Santa Ana has 1 RL property. The occupancy type for this property is single-family residential. The structure has one story with a crawl space foundation and is 2,600.8 square feet.

Table 4-69. Summary of Structures in Santa Ana RLA5

	Number	Percentage
Occupancy		
Single-Family Residential	988	86.8%
Manufactured Home	59	5.2%
Multi-Family Housing 2 Units	22	1.9%
Stories		
1 Story	1,069	93.9%
2 Stories	67	5.9%
4 Stories	2	0.2%
Foundation		
Crawl Space	542	47.6%
Slab	382	33.6%
Pile	109	9.6%
Total Number of Structures	**1,138**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

Table 4-70. Problem Statement for Santa Ana RLA5

FEMA Repetitive Loss Property #	Problem Statement
137791	Flooding from adjacent higher properties and poor property drainage

Note: flooding source reviewed and provided by the community.

Table 4-71. FEMA Identified Repetitive Loss Properties in Santa Ana RLA5

FEMA Repetitive Loss Property #	Occupancy	Stories	Foundation	Square Feet	Probable Mitigation Measures
137791	Single-Family Residential	1	Crawl Space	2,600.8	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC. Structural elevation, foundation mitigation

FEMA Repetitive Loss Property #	Occupancy	Stories	Foundation	Square Feet	Probable Mitigation Measures
					techniques, and floodproofing considerations.

Source: FEMA/ISO

4.4.7 City of Santa Ana RLA6

To determine the nearby structures and for CRS purposes, a half-mile buffer was applied to the RL areas around structures near the RL properties. This was done to aggregate the RL area data and the Personally Identifiable Information. Each CRS community will have specific information for their community listed in their CRS Activity 501 documentation. RLA6 is shown in Figure 4-22.

There are a total of 1,913 structures located in RLA6 for Santa Ana. The most common occupancy type for structures in this area is single-family residential structures which is 85.7 percent of total structures. When looking at the number of stories, most structures in this area are single story, which make up 4.4 percent. Finally, the most common foundation types for structures in this area is either a crawl space which is 45.3 percent of the total structures, or slab foundation, which makes up 38.2 percent of the total structures. Based on this data, the most common structure for this RL area is a single-family residential structure that is single story with either crawl space or slab foundation. Table 4-72 shows the top three occupancy types, number of stories, and foundation types for structures in this RL area. The flooding source for this RL area is “Local drainage issue.”

RLA6 of Santa Ana has 1 RL property. The occupancy type for this property is single-family residential. The structure has one story with a crawl space foundation and is 1,916.6 square feet.

Table 4-72. Summary of Structures in Santa Ana RLA6

	Number	Percentage
Occupancy		
Single-Family Residential	1,639	85.7%
Multi-Family Housing 2 Unit	60	3.1%
Multi-Family Housing 5 – 10 Units	42	2.2%
Stories		
1 Story	1,821	95.2%
2 Stories	85	4.4%
3 Stories	7	0.4%
Foundation		
Crawl Space	867	45.3%
Slab	731	38.2%
Pile	141	7.4%
Total Number of Structures	**1,913**	

Source: U.S. Army Corps of Engineers National Structure Inventory 2022

Table 4-73. Problem Statement for Santa Ana RLA6

FEMA Repetitive Loss Property #	Problem Statement
302779	Flooding from adjacent higher properties and poor property drainage

Note: flooding source reviewed and provided by the community.

Figure 4-22. Santa Ana Repetitive Loss Area 6

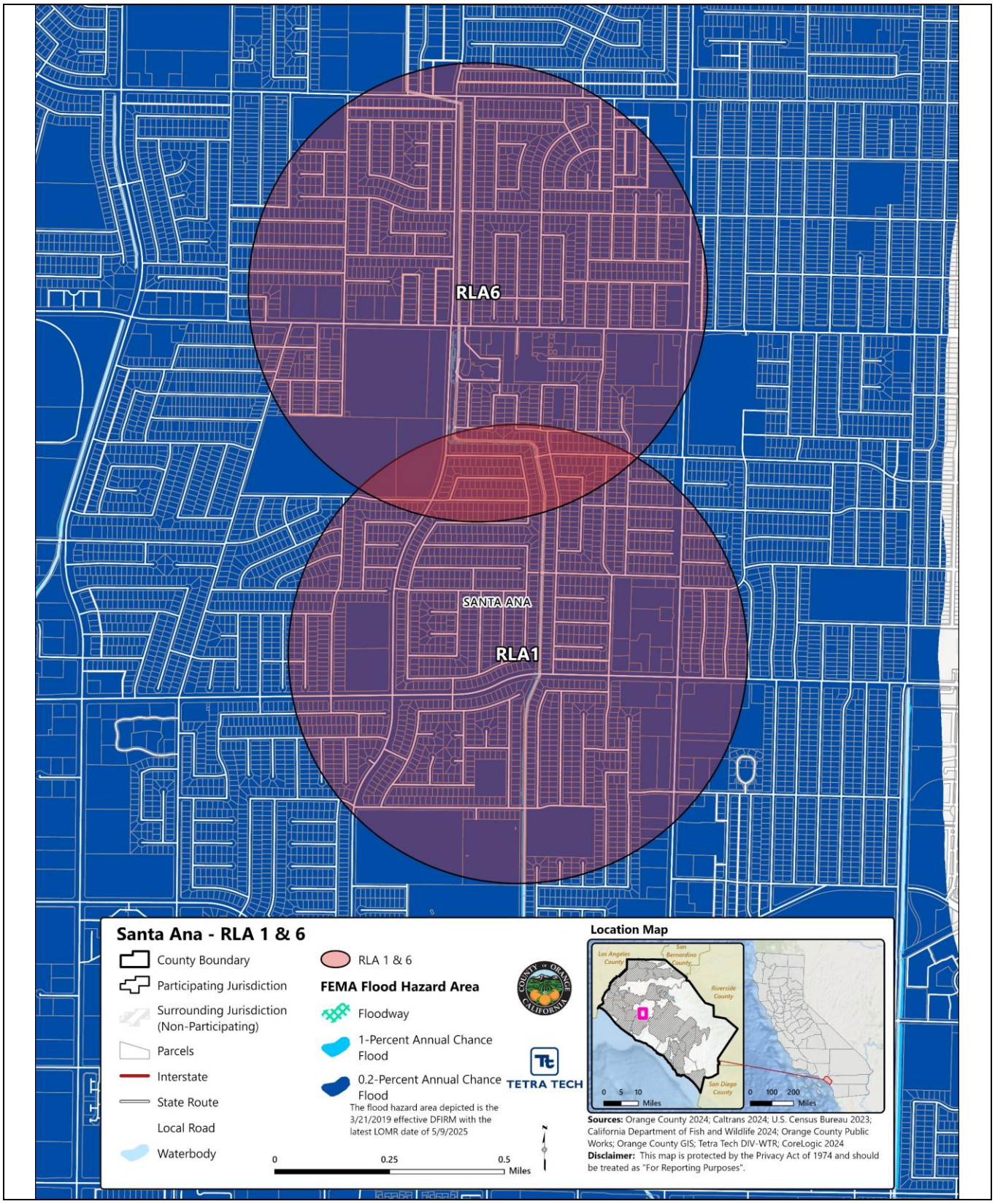


Table 4-74. FEMA Identified Repetitive Loss Properties in Santa Ana RLA6

FEMA Repetitive Loss Property #	Occupancy	Stories	Foundation	Square Feet	Probable Mitigation Measures
302779	Single-Family Residential	1	Crawl Space	1,916.6	Consider maintaining a flood insurance policy. Consider property maintenance techniques that may reduce flood risk such as positive drainage and elevating HVAC. Structural elevation, foundation mitigation techniques, and floodproofing considerations.

Source: FEMA/ISO; U.S. Army Corps of Engineers National Structure Inventory 2022

5. MITIGATION MEASURES

Mitigation is used to reduce the flood risk and repetitive losses for a property and there are many different mitigation measures that property owners can undertake. Identifying feasible alternative mitigation measures for structures located in RL areas of a community is Step 4 of the 5-Step RLAA. The review of the feasible mitigation measures must look at the property protection measures that are listed in the CRS Coordinator Manual, which are shown in Figure 1-2 and Figure 1-1. Unincorporated Orange County and three of the incorporated cities within it have identified repetitive loss properties as summarized in Table 5-1. This section reviews mitigation measures that can be undertaken to reduce flood risk and identifies those that are feasible for the RL areas in each jurisdiction.

Table 5-1. Repetitive Loss Property Summary for Orange County

Community Name and ID Number	CRS Community Category	Number of RL Properties
Unincorporated Orange County (060212)	B	6
City of Newport Beach (060227)	B	8
City of San Juan Capistrano (060231)	B	1
City of Santa Ana (060232)	B	6

Source: FEMA Provided Repetitive Loss Data, 2023, NFIP RL (Y)

The completed RL area assessment for the four RLAA participating communities determined the primary occupancy within each community's RL area was residential use with common foundation types including:

- Slab
- Crawlspace
- Basement
- Pile

Based on the common foundation types within the RLAA, this section identifies mitigation actions specific to the parcel, the problem statement, and by foundation type.

Slab and crawlspace foundation types were the most common throughout the participating areas with local drainage issues or site-specific issues noted as the main problem statements. From the community assessments, it is noted that owners of some RL properties have taken private actions to reduce flood risk to their property. Since the level of effort completed by the property owners did not require a building permit, there is not a measurable action to determine if the property owners' action did mitigate the flooding that contribute to the RL. Some of these efforts included property maintenance measures such as adding or expanding French drains, extending downspouts, and sloping drainage away from the foundation of the property.

Southern California is prone to flash flooding due to its Mediterranean climate, characterized by dry summers and intense, short-duration rainfall events. The region's urbanization, with extensive impervious surfaces like roads and buildings, increases runoff and strain on stormwater systems. Steep terrain and narrow canyons further exacerbate flash flood risks by rapidly channeling water downstream. Flash floods can cause significant property damage, disrupt transportation, and pose serious safety hazards. Efforts to manage flash flooding include improved land use planning, stormwater infrastructure upgrades, and public education on flood preparedness.

5.1 TYPES OF MITIGATION

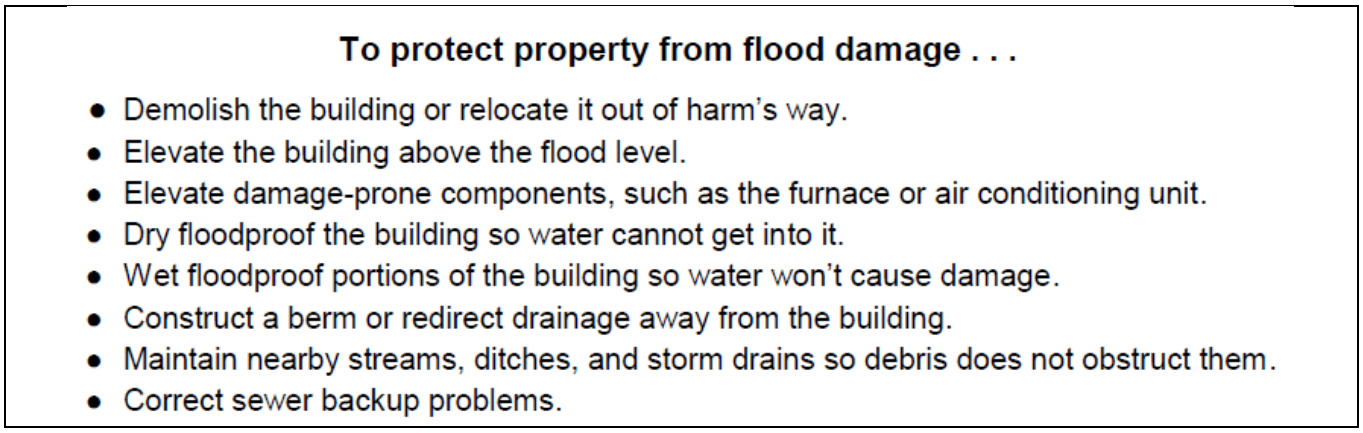
There are many measures that communities and property owners can use to reduce flood risk and mitigate its impacts. These mitigation measures, however, are not a “once size fits all” in that they will not fit every flood hazard case. Thus, a successful flood mitigation solution often requires using multiple strategies. The CRS Coordinator’s Manual lists the primary types of mitigation, as described in the following sections (FEMA 2025). Figure 5-1 lists the 6 categories of mitigation and Figure 5-2 describes property specific mitigation actions to reduce flood risk. For all RL properties and RL areas, we assessed the appropriate property protection measures as well as actions specific to the flood risk in Southern California.

Figure 5-1. CRS Coordinator's Manual Figure 510-2 Categories of Floodplain Management Activities

1. **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, and/or code enforcement offices.
   - Floodplain mapping and data
   - Open space preservation
   - Floodplain regulations
   - Erosion setbacks
   - Planning and zoning
   - Stormwater management
   - Drainage system maintenance
   - Building codes
2. **Property protection** activities are usually undertaken by property owners on a building-by-building or parcel basis.
   - Relocation
   - Acquisition
   - Building elevation
   - Retrofitting
   - Sewer backup protection
   - Insurance
3. **Natural resource protection** activities preserve or restore natural areas or the natural functions of floodplain and watershed areas. They are implemented by a variety of agencies, primarily parks, recreation, or conservation agencies or organizations.
   - Wetlands protection
   - Erosion and sediment control
   - Natural area preservation
   - Natural area restoration
   - Water quality improvement
   - Coastal barrier protection
   - Environmental corridors
   - Natural functions protection
4. **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 or critical facilities.
   - Hazard threat recognition
   - Hazard warning
   - Hazard response operations
   - Critical facilities protection
   - Health and safety maintenance
   - Post-disaster mitigation actions
5. **Structural projects** keep flood waters away from an area with a levee, reservoir, or other flood control measure. They are usually designed by engineers and managed or maintained by public works staff.
   - Reservoirs
   - Levees/floodwalls
   - Diversions
   - Channel modifications
   - Storm drain improvements
6. **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. They are usually implemented by a public information office.
   - Map information
   - Outreach projects
   - Real estate disclosure
   - Library
   - Technical assistance
   - Environmental education

Source: (FEMA 2025)

Figure 5-2. CRS Coordinator's Manual Figure 360-1 Typical Property Protection Measures



Source: (FEMA 2025)

5.1.1 Flood Insurance

Flood insurance coverage is the first responder to flood damage. Coverage is considered a priority action encourage by the County and participating RLAA communities to its citizens and business owners. As an NFIP community, NFIP flood insurance is available to all within unincorporated Orange County, City of Newport Beach, City of Santa Ana, and the City of San Juan Capistrano. Properties do not need to be within the mapped FEMA floodplain to qualify for a flood insurance policy. Flood insurance coverage is important because of the following:

- **Protection Against Financial Loss:** Flooding can cause extensive damage to homes and property. Standard homeowners' insurance policies typically do not cover flood damage, so flood insurance provides critical financial protection.
- **High Risk of Flooding:** Many areas, including those not traditionally considered flood zones, can experience flooding due to heavy rain, storms, hurricanes, or rising water levels. Flood insurance helps mitigate this risk.
- **Cost of Repairs:** Flood damage repairs can be very expensive, including structural repairs, replacing furniture, appliances, and personal belongings. Flood insurance helps cover these costs. This includes the potential for Increased Cost of Compliance (ICC) coverage that can provide additional funds to insured homeowners for the repair of Substantially Damaged or RL structures in the SFHA.
- **Mortgage Requirement:** Lenders often require flood insurance for properties located in designated flood zones as a condition of the mortgage.
- **Peace of Mind:** Having flood insurance provides homeowners and business owners with peace of mind knowing they are financially protected if a flood occurs.
- **Recovery Assistance:** Flood insurance can speed up recovery by providing funds to repair and rebuild quickly after a flood event.

For NFIP policy claims, a flood is defined as a general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties (at least one of which is the policyholder's property) from any of the following (FloodSmart n.d.):

- Overflow of inland or tidal waters;
- Unusual and rapid accumulation or runoff of surface waters from any source;
- Mudflow (defined as a river of liquid and flowing mud on the surfaces of normally dry land areas); or

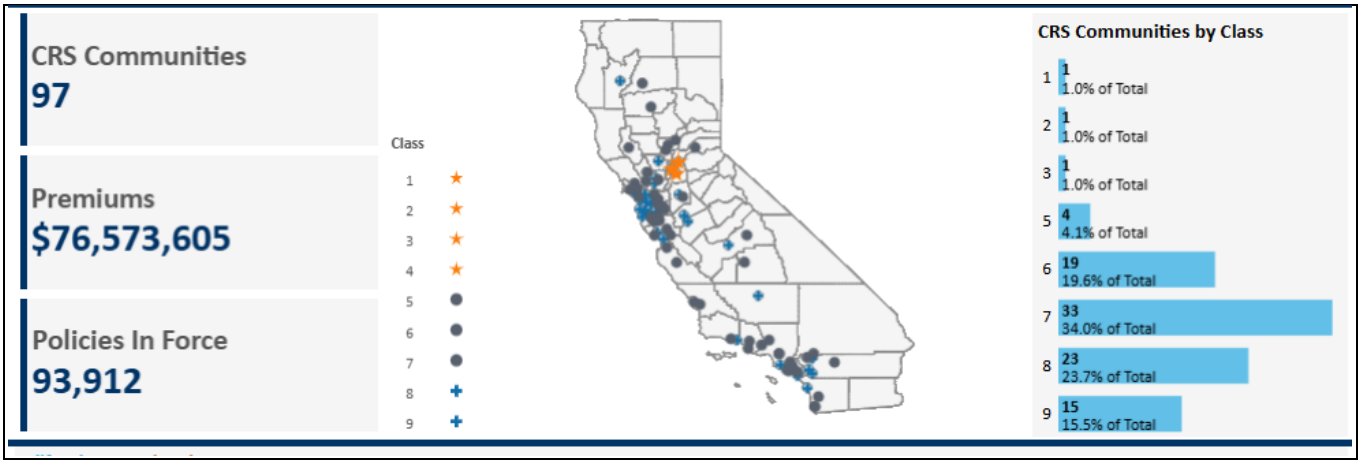
- Collapse or subsidence of land along the shore of a lake or similar body of water because of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels.

This definition determines whether a loss qualifies as a flood event under the NFIP policy for claims purposes. Flood insurance is available from private insurance providers and the NFIP.

Increased Cost of Compliance coverage is available for properties declared by the local floodplain administrator to be substantially or repetitively damaged. An additional payment of up to $30,000 is available to help cover the costs of bringing a structure into compliance with the local flood damage prevention ordinance, or for the demolition or relocation of a structure.

FEMA CRS participating communities are eligible for a 5 to 45 percent NFIP policy discount. Figure 5-3 summarizes CRS communities in California as of April 2026.

Figure 5-3. CRS State Profile for California, April 2026



Source: (Verisk 2025)

Actions: All four RLAA communities participate in the NFIP, making flood insurance available to anyone within the community. Ensuring that substantial damage and repetitive loss provisions are incorporated into local ordinances will ensure that flood insurance policyholders are eligible for ICC coverage. You do not have to be mapped within a floodplain for flood insurance availability. Property owners and renters are encouraged to learn more about flood insurance through the NFIP or with a private flood insurance company. There are three CRS participating communities in the RLAA and they receive a discount for NFIP policyholders. Property owners are encouraged to learn more about flood insurance at www.floodsmart.gov and speak to their property insurance provider for additional information.

Community and Public Resources:

- FEMA National Flood Insurance Program | https://www.floodsmart.gov
- FEMA Flood Insurance | https://www.fema.gov/flood-insurance
- Association of State Floodplain Managers Reduce Flood Risk | https://www.reducefloodrisk.org/

5.1.2 Preventive Activities

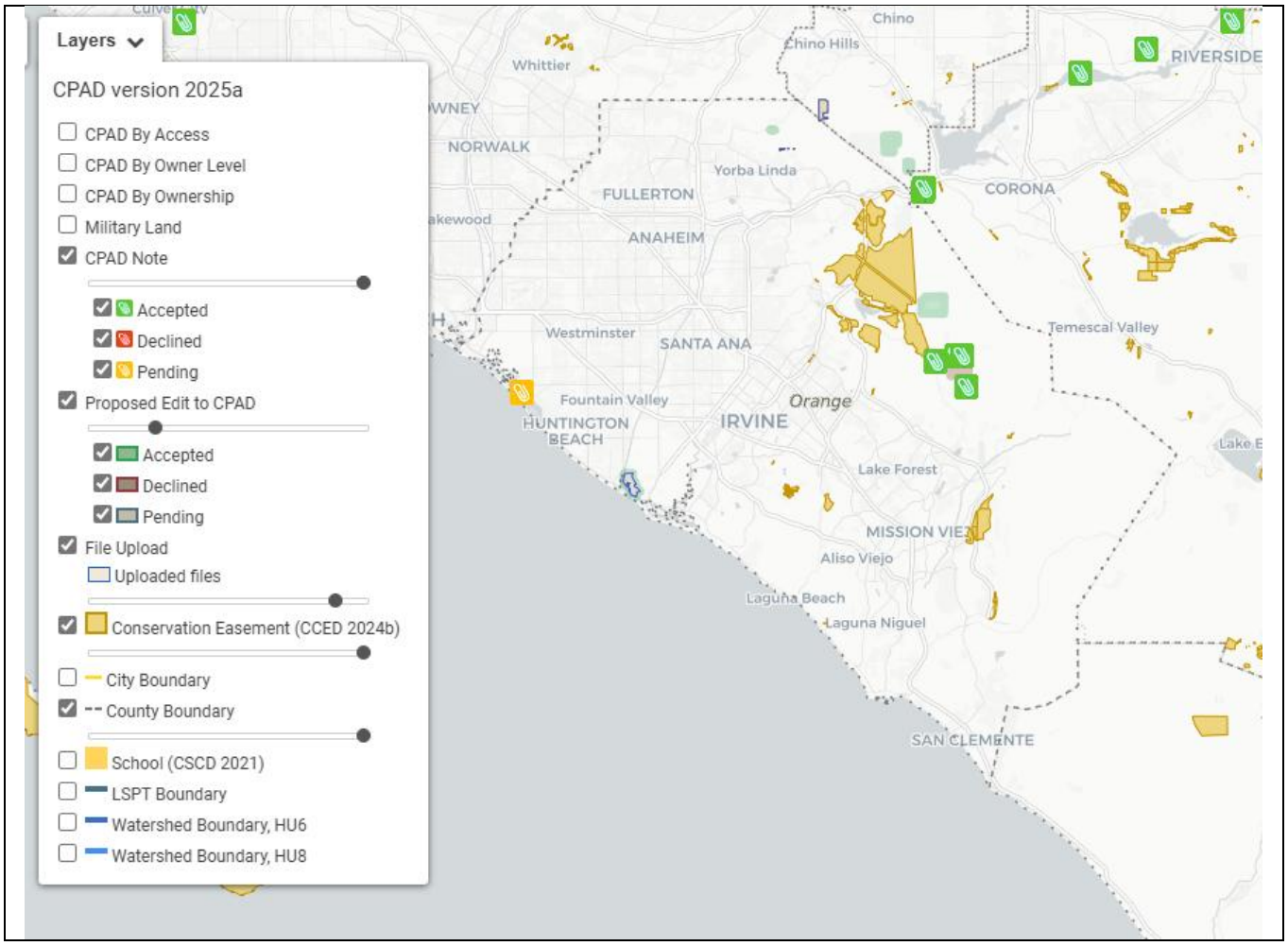
Preventive activities keep the flood problems from getting worse. This is typically done through limiting the development in flood-prone areas by using planning, land acquisitions, and regulations. Examples of these include updated floodplain mapping and data to show the areas of increased flood risk, developing floodplain regulations and building codes to ensure that any new development in the floodplain has a reduced risk of flooding impacts, and acquisition of flood prone property to preserve as open space. The departments in a community that may handle these activities include building departments, zoning and planning departments, and code enforcement departments.

Land use regulations control how land is developed and managed to reduce flood risk by preventing construction in flood-prone areas, preserving natural floodplains, and managing stormwater runoff. California is proactively addressing flood reduction though various initiatives including:

- A state comprehensive flood management strategy that includes sustainable practices and collaboration with regional efforts
- Restoring floodplains and implementing multi-benefit projects that enhance water security and support ecosystems
- Exploring nature-based solutions

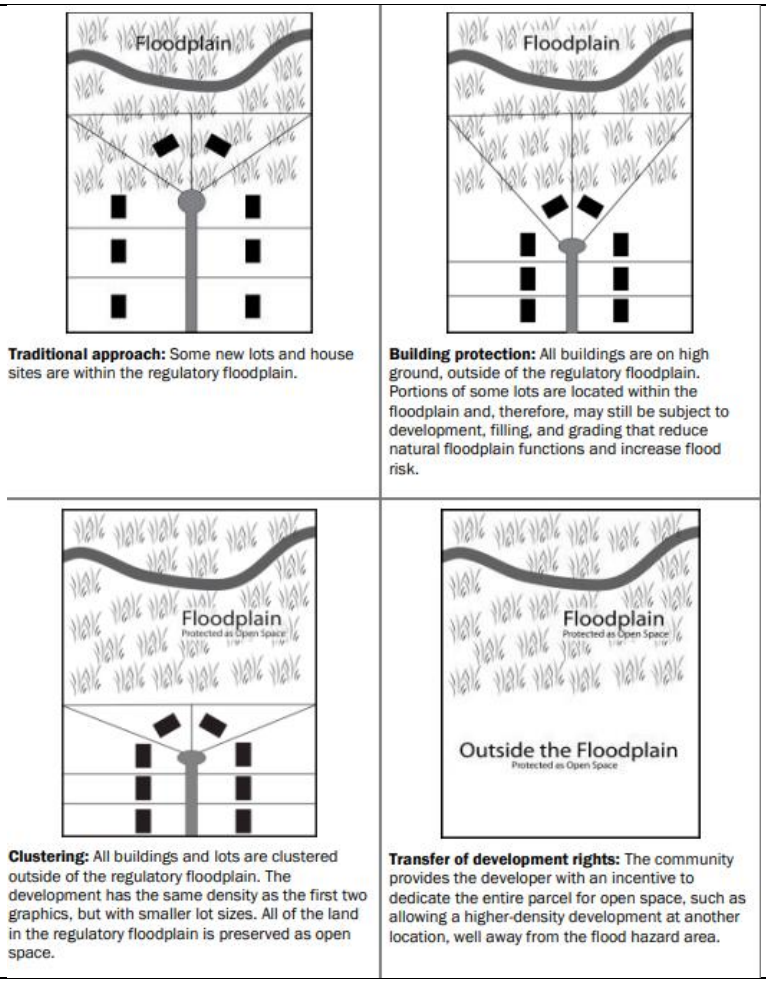
Open space preservation helps reduce flood risk in California by maintaining natural landscapes such as wetlands, forests, and floodplains that absorb and slow down runoff during heavy rains. These areas act as natural buffers, reducing the speed and volume of water flowing into rivers and urban areas, which lowers the chances of flooding. Additionally, preserved open spaces prevent development in high-risk flood zones, minimizing damage and preserving natural drainage systems. California's Protected Areas (https://calands.org/) and California Conservation Easement Databases are GIS databases identifying lands that are protected for open space purposes by public agencies or non-profits. Within Orange County, nature conservancy easements and nature preserves are regulated for recreation and conservation (Figure 5-4). For alternative ways to develop a partially flood-prone property refer to Figure 5-5.

Figure 5-4. California's Protected Areas Database for Orange County



Source: (mapcollaborator.org 2025)

Figure 5-5. Alternative Ways to Develop a Partially Flood-Prone Property



Source: (FEMA 2025)

Table 5-2 is a summary of adopted and enforced regulatory land use standards for each participating RLAA community. Land use planning in California plays a crucial role in flood risk reduction by controlling development in flood-prone areas, preserving natural floodplains, wetlands, and open spaces that absorb and slow floodwaters. Smart land use policies encourage building outside high-risk zones, maintaining permeable surfaces to reduce runoff, and integrating green infrastructure. These strategies help minimize flood damage, protect communities, and sustain natural water flow systems. Effective land use decisions are essential for long-term flood resilience in California.

Table 5-2. Regulatory Land Use Standards for Participating RLAA Communities

Community Name and ID Number	Adopted Land Use Codes	Adopted Building Codes	Adopted Flood Damage Prevention Ordinance	Stormwater Management Regulations
Unincorporated Orange County (060212)	X	X	X	X
City of San Juan Capistrano (060231)	X	X	X	X
City of Newport Beach (060227)	X	X	X	X
City of Santa Ana (060232)	X	X	X	X

Actions: All four RLAA participating communities enforce land use, building code, flood damage prevention and stormwater management regulations throughout regulated floodplains and development community wide. Each community is proactive in development trends and encouraging open space preservation and natural floodplains functions. Communities are encouraged to continue land use regulations supporting open space preservation by deed restrictions, regulatory enforcement, subdivision regulations, and zoning. This includes the adoption of higher standards that exceed the minimum NFIP and State of California requirements.

FEMA CRS Activity 420, Open Space Incentives provides examples of land use management approaches to encourage property owners to keep the floodplain open when a site is developed. All RLAA participating communities are encouraged to consider adopting open space incentives to further strengthen their floodplain management programs. Figure 29 is a CRS Activity 420 example of alternative ways to develop a property that is partially flood-prone though land use and subdivision regulations.

Repetitive Loss (RL) and Severe Repetitive Loss (SRL) grants are federal funding programs, often administered by FEMA, aimed at reducing flood risk by addressing properties that have experienced multiple flood losses. These grants provide financial assistance to buy out, elevate, or otherwise mitigate properties that have flooded repeatedly, helping communities reduce long-term flood damage and insurance costs. The programs target the most vulnerable properties to improve public safety and resilience and require open space deed restrictions.

Buyout grant programs in California are initiatives that provide funding to purchase properties, typically in flood-prone or high-risk areas, with the goal of removing structures from harm's way permanently and maintaining open space deed restrictions. These programs help reduce flood risk, restore natural floodplains, and improve community resilience by converting bought-out properties into open space, parks, or natural habitats. Buyout grant programs in California typically include funding from federal sources like FEMA's Hazard Mitigation Grant Program (HMGP) and the Flood Mitigation Assistance (FMA) program, as well as state programs such as the California Department of Water Resources' Floodplain Management Program. These grants provide financial assistance to local governments and agencies to acquire flood-prone properties, demolish structures, and restore the land to open space or natural floodplain. The goal is to reduce future flood damage and improve environmental resilience.

California offers several grant programs that support conservation easements, which are legal agreements that restrict land development to protect natural resources. Key programs include grants from the California Natural Resources Agency, such as the California Wildlife Conservation Board (WCB) grants, which fund conservation easements to preserve wildlife habitats, open spaces, and agricultural lands. Additionally, federal programs like the USDA's Agricultural Conservation Easement Program (ACEP) may also provide funding in California. These grants help landowners and organizations protect important ecological areas while allowing the land to remain privately owned.

Community and Public Resources:

California Department of Water Resources maintains flood planning and studies supporting basin feasibility studies, flood protection plans, statewide flood management plan, conservation strategy, regional flood management planning resources, and community resources. https://water.ca.gov/Programs

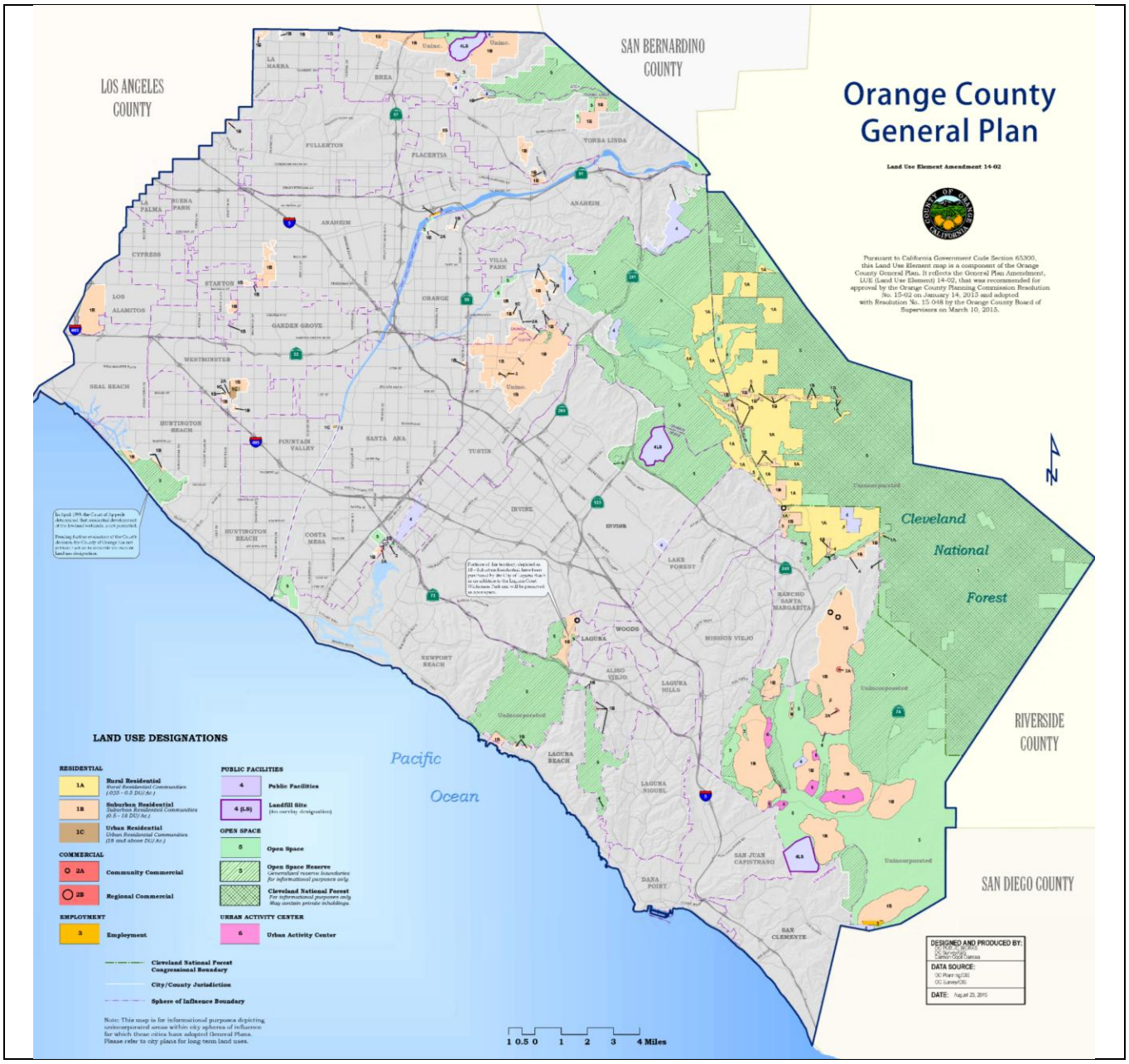
California's Protected Areas Database | https://calands.org/

- FEMA 2025 CRS Coordinator's Manual | https://www.fema.gov/sites/default/files/documents/fema_crs_coordinators-manual_082025.pdf

Unincorporated Orange County

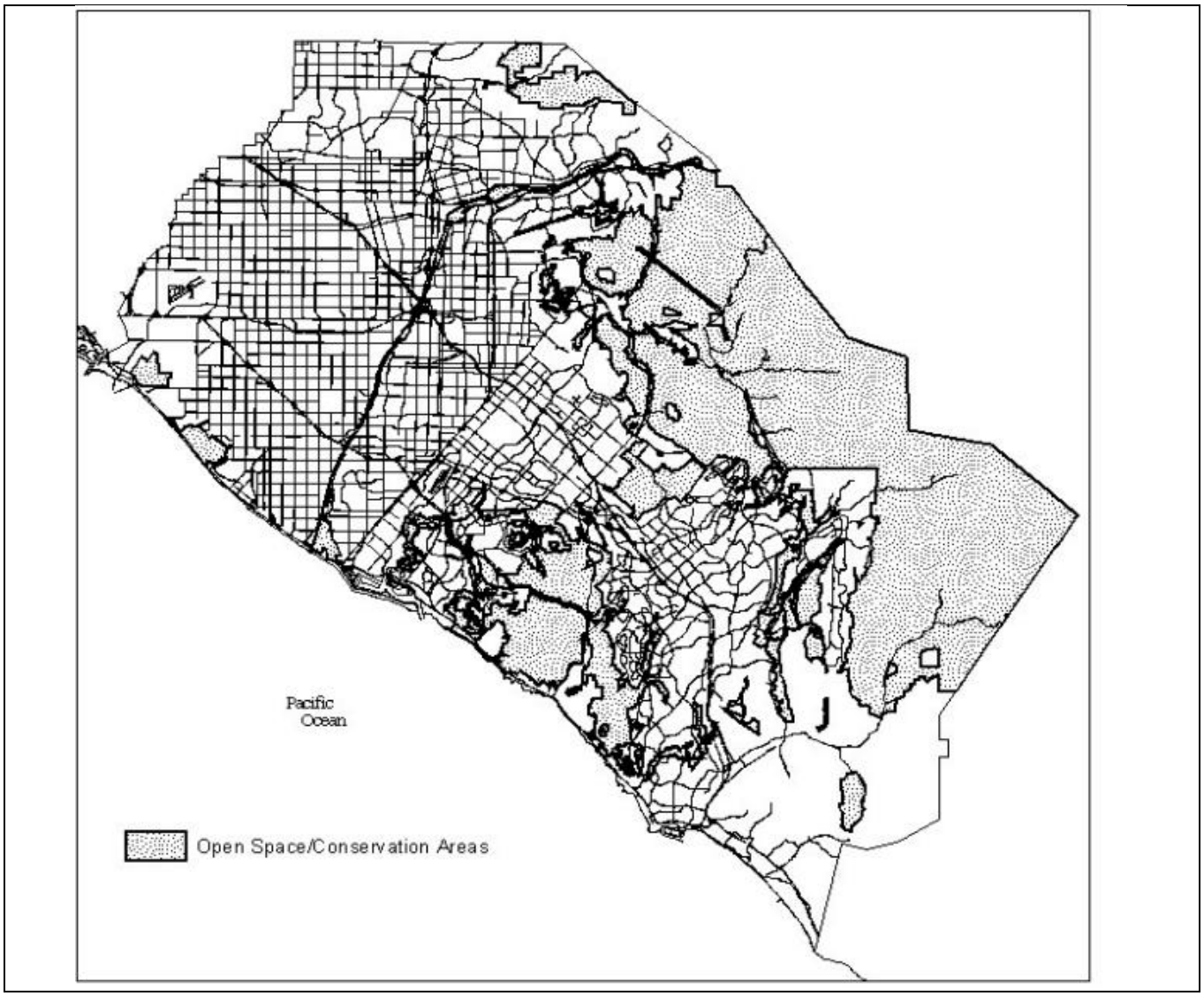
Unincorporated Orange County has adopted building codes, zoning/land use codes, subdivision codes, floodplain management regulations, and stormwater management codes that all address flood related hazards. The county department that is responsible for these codes and ordinances is Orange County Public Works. The codes are listed under different sections of Orange County's Code of Ordinances with the building codes, zoning/land use codes, subdivision codes, and floodplain management regulations are under the Title 7 – Land Use and Building Regulations while the stormwater management codes are located under Title 9 – Water Quality – Orange County Flood Control District.

Figure 5-6. Unincorporated Orange County Land Use Map



Source: (OCPW 2015)

Figure 5-7. Orange County Open Space/Conservation Program Map

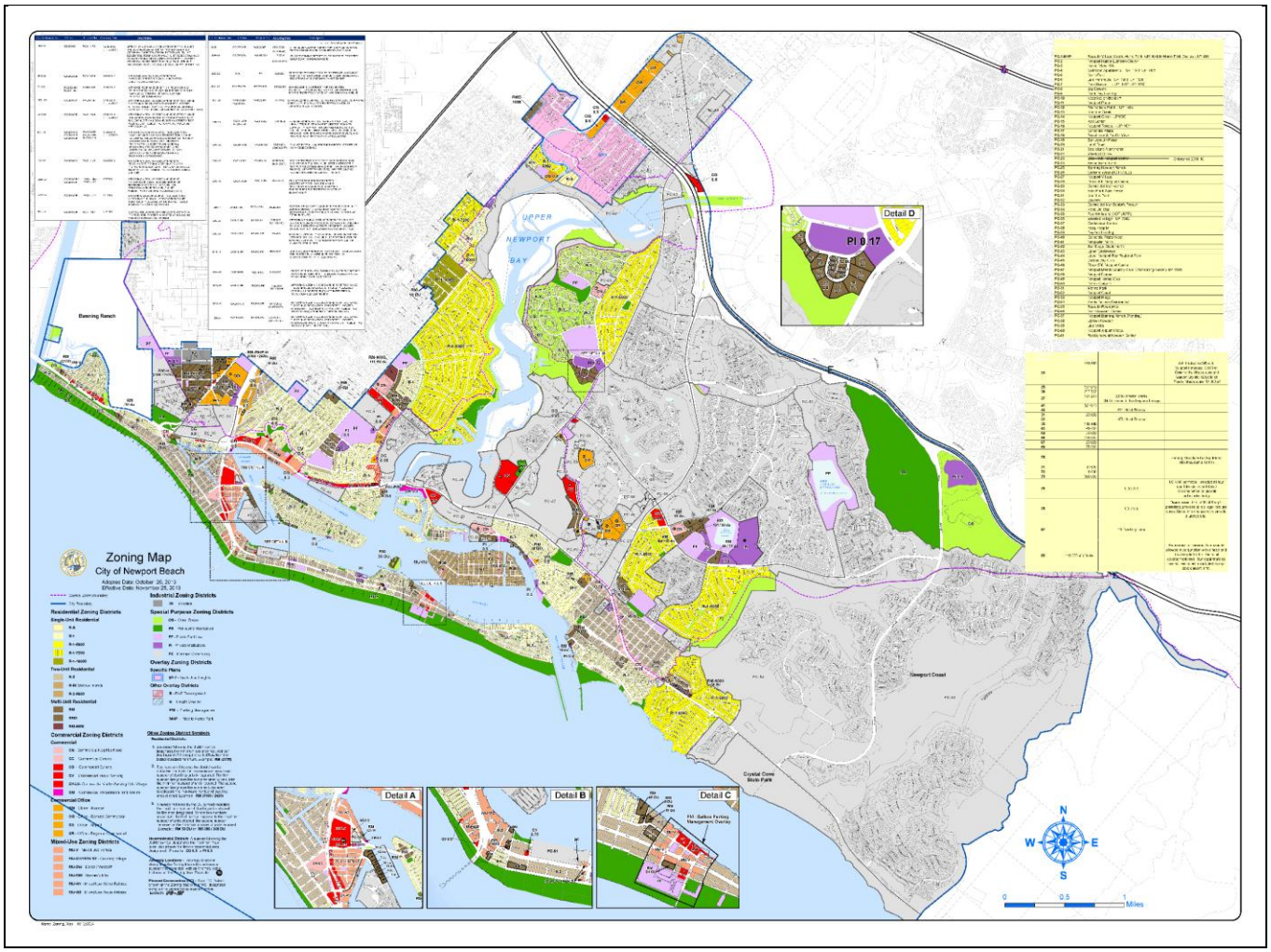


Source: (OCPW n.d.-a, VI-20)

Newport Beach

The City of Newport Beach has adopted building codes, zoning/land use codes, subdivision codes, floodplain management regulations, and stormwater management codes that all address flood related hazards. The city department that is responsible for the building codes, zoning/land use codes, subdivision codes, and floodplain management regulations is the Community Development Department and different divisions within this department handles the different codes, the building codes and floodplain management regulations are handled the by the Building Division. The zoning/land use codes, and subdivision codes are handled by Planning Division, and the stormwater management codes are handled by the Public Works Department. The codes are listed under different sections of Newport Beach Municipal Code with building codes and floodplain management regulations under Title 15 – Buildings and Construction of Newport Beach's Municipal Code, the zoning/land use code is under Title 20 – Planning and Zoning, the subdivision codes under Title 19 – Subdivision, and the stormwater codes under Title 14 – Water and Sewers.

Figure 5-8. Newport Beach Zoning Map

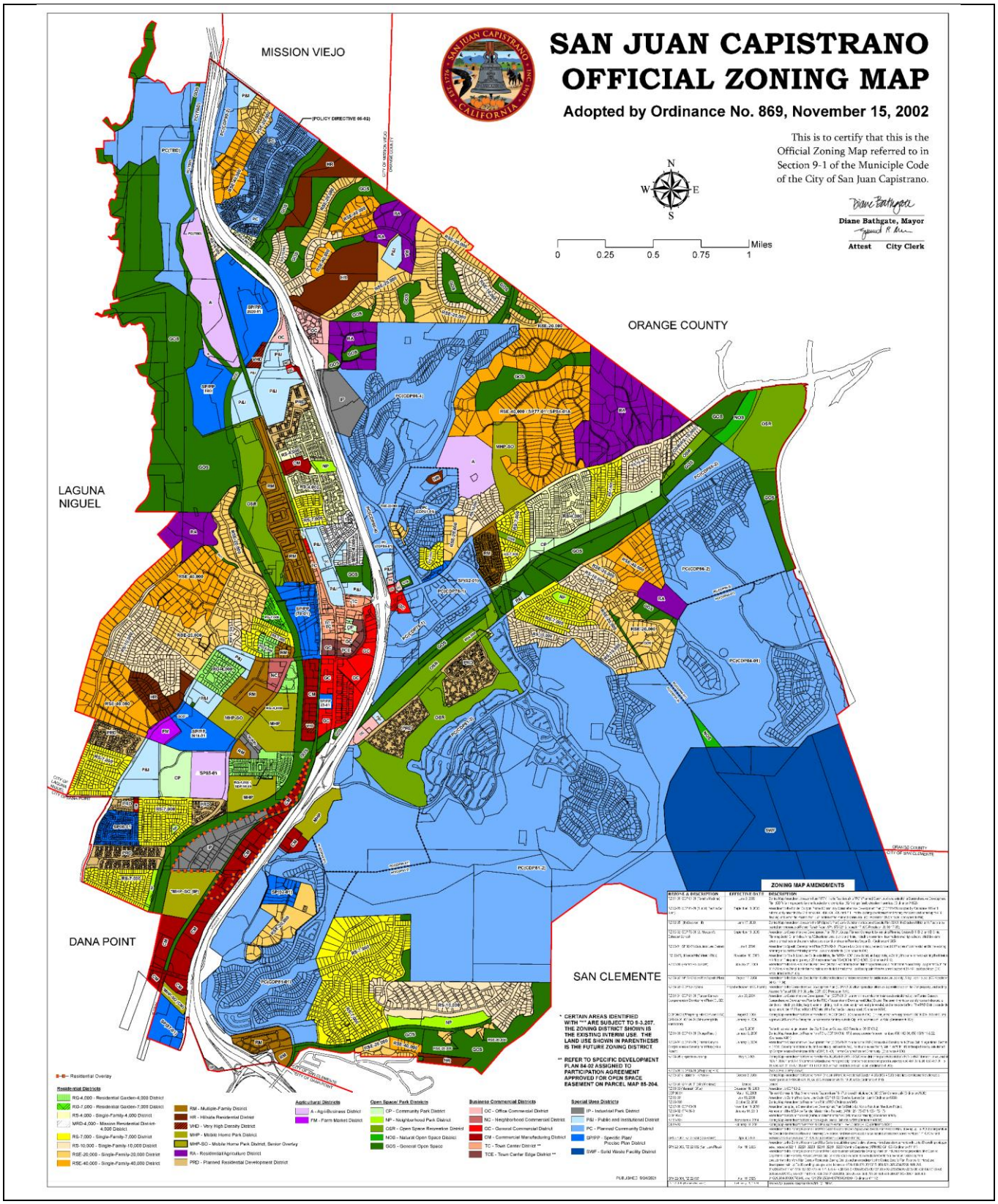


Source: (Newport Beach n.d.-d)

San Juan Capistrano

The City of San Juan Capistrano has adopted building codes, zoning/land use codes, subdivision codes, floodplain management regulations, and stormwater management codes. These codes are handled by different city departments, with the building codes handled by the Building Division of the Development Services Department, the zoning/land use and subdivision codes handled by the Planning Division of the Development Services Department, the floodplain management regulations handled by the Engineering & Environmental Services Department, and the stormwater management codes under the Utilities Department. These codes are listed under two sections of San Juan Capistrano's Municipal Code with the building codes, floodplain management regulations, and stormwater management codes located under Title 8 – Regulations, and the zoning/land use codes and subdivision codes list located under Title 9 – Land Use.

Figure 5-9. San Juan Capistrano Zoning Map

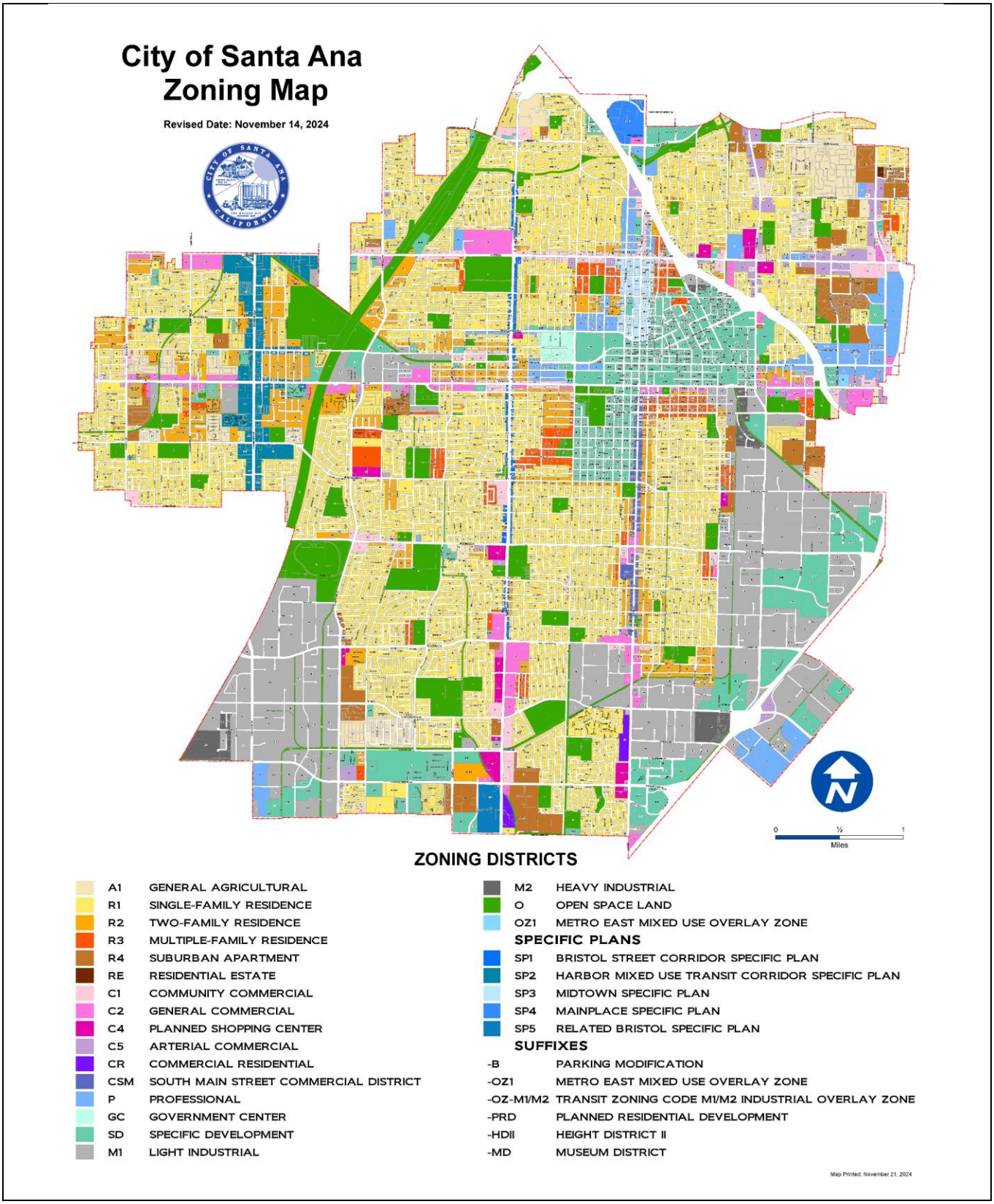


Source: (San Juan Capistrano n.d.-c)

Santa Ana

The City of Santa Ana has adopted building codes, zoning/land use codes, subdivision codes, subdivision codes, stormwater management codes, floodplain management ordinances, environmental protection ordinances, and an emergency management ordinance. The building codes, zoning/land use codes, floodplain management ordinances, and subdivision codes are handled by the city's Planning and Building Agency. These codes and ordinances are listed under different sections of the Santa Ana Municipal Code with the building codes listed under Chapter 8 – Buildings and Structures, the zoning/land use codes listed under Chapter 41 – Zoning, the subdivision code listed under Chapter 34 -- Subdivision, and the floodplain management ordinances listed under Chapter 7 -- Floodplain Management. The stormwater and environmental protection ordinances are handled by the city's Department of Public Works. The stormwater ordinances are listed under Chapter 18 – Health and Sanitation of the Santa Municipal Code, and the environmental protection ordinances are listed under Chapter 18, Section 18-155 Stormwater Pollution. The emergency management ordinance is handled by the Santa Ana Police Department and is listed under Chapter 2 – Administration, Article IV – Officers, Departments, Boards, and Commissions, Division 15 of the Santa Ana Municipal Code.

Figure 5-10. Santa Ana Zoning Map



Source: (Santa Ana 2023)

5.1.3 Property Protection

Homeowners can reduce flood risk by regularly maintaining their properties, such as clearing gutters and drains to prevent water buildup, sealing cracks in foundations and walls to keep water out, and ensuring proper grading around the home to direct water away. Installing sump pumps, backflow valves, and elevating utilities also help protect homes from flooding. These proactive measures minimize water intrusion, reduce damage, and contribute to overall community flood resilience. Property protection activities are usually undertaken by property owners and are specific to the property being mitigated.

Some property protection activities are regulated under the community's adopted permitting standards. Property owners are encouraged to communicate with the community's building permit department in advance of starting any property protection measures.

California rain barrel programs encourage residents to collect and reuse rainwater from rooftops to reduce stormwater runoff and conserve water. These programs often offer rebates, discounts, or free rain barrels to homeowners and promote sustainable water management practices. Rain barrels collect and store rainwater from rooftops, which reduces the amount of stormwater runoff flowing into storm drains and local waterways during heavy rains. By capturing this water, rain barrels help decrease the volume and speed of runoff that can cause flooding and overwhelm drainage systems. This not only lowers flood risk but also reduces erosion and water pollution, contributing to healthier urban environments.

By capturing rainwater, these programs help reduce the volume of runoff entering storm drains, which can decrease flooding and pollution in local waterways. The primary rebate program for rain barrels in Orange County is offered through SoCal Water$mart (https://socalwatersmart.com/en/residential/rebates/available-rebates/rain-barrels-cisterns/), a program funded by the Metropolitan Water District of Southern California. Rebate amount: Residents can receive a rebate of $35 per qualifying rain barrel. This is a great way to make your conservation efforts more affordable.

- Eligible items: The rebate covers rain barrels with a minimum capacity of 50 gallons.
- Household limit: You can apply for a rebate for up to two rain barrels per household, which could potentially save you up to $70.

Some local governments and water agencies in California offer rebate programs to encourage homeowners to install sump pumps or upgrade to more efficient models. These programs aim to help reduce basement flooding and manage groundwater by pumping excess water away from homes. Rebates can help offset the cost of purchase and installation, making it more affordable for residents to protect their properties from water damage. While not all areas offer specific sump pump rebate programs, some local water districts or municipalities in California provide rebates or financial incentives to encourage homeowners to install or upgrade sump pumps. These programs aim to reduce basement flooding and manage stormwater more effectively. In Orange County, residents are encouraged to check with their local water districts or city government websites for any available rebate programs or financial assistance related to sump pump installation.

Many California counties promote rain gardens as part of stormwater management and environmental initiatives. Orange County may have programs through local water districts, municipalities, or environmental groups encouraging rain garden installation to reduce runoff and improve water quality. For example, the *H2OC Stormwater Program* (https://h2oc.org/rainsmart/) *identifies existing rebates available from the Metropolitan Water District of Southern California and the Municipal Water District of Orange County in the form of property owner incentives and assistance to make watershed-wise upgrades to their landscaping and to utilize rainwater as a resource.*

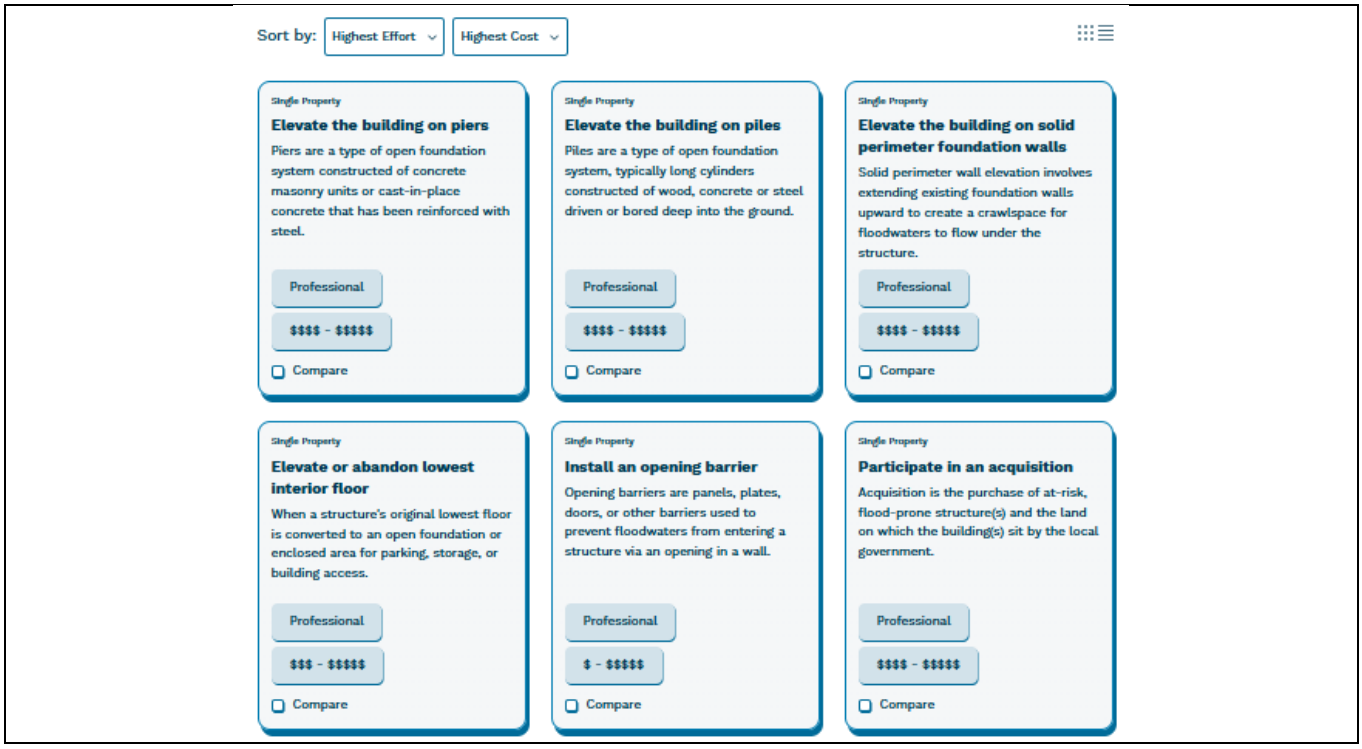
Figure 5-11. Landscape and Rainwater Collection Rebate Examples with H2OC



Source: [RainSmart Rebates Pilot Program - H2OC Stormwater Program]

The Association of State Floodplain Managers has developed a website focused on reducing flood risk (https://www.reducefloodrisk.org/) at the property owner level. This Reduce Flood Risk interactive website allows the user to navigate and explore potential property mitigation actions and research a variety of methods based on maintenance, action required if flood is imminent, relative cost, and level of effort. Each action provides an overview of the mitigation strategy, a high-level summary of actions, and special considerations for the property owners to be aware of in advance planning.

Figure 5-12. Categories of Actions to Reduce Flood Risk



Source: (Reduce Flood Risk n.d.-d)

Examples of property protection methods listed in the CRS Coordinator's Manual as shown in Figure 5-2 include demolishing or relocating a structure outside of the floodplain, elevating the structure above the flood level, elevating damage-prone components, dry or wet floodproofing structures, maintaining nearby streams, ditches, and storm drains, and correcting sewer backup problems (FEMA 2025). FEMA publications that property owners can reference to determine the best mitigation measure for their property include the following:

- FEMA 551 – Selecting Appropriate Mitigation Measures for Floodprone Structures
- FEMA 347 – Above the Flood: Elevating Your Floodprone House
- FEMA P-1037 – Reducing Flood Risk to Residential Buildings That Cannot Be Elevated
- FEMA P-312 – Homeowner's Guide to Retrofitting: Six Ways to Protect Your Home From Flooding
- FEMA 511 – Reducing Damage From Localized Flooding
- FEMA P-85 – Protecting Manufactured Homes from Floods and Other Hazards
- FEMA P-259 – Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures
- FEMA 54 – Elevated Residential Structures
- FEMA NFIP Technical Bulletin 7 – Wet Floodproofing Requirements and Limitations
- FEMA NFIP Technical Bulletin 3 – Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings
- FEMA P-499 – Home Builder's Guide to Coastal Construction
- FEMA P-550 – Recommended Residential Construction for Coastal Areas
- FEMA 257 – Mitigation of Flood and Erosion Damage to Residential Building in Coastal Area
- FEMA P-55 – Coastal Construction Manual Volume 1 & 2
- FEMA P-2181 – Hurricane and Flood Mitigation Handbook for Public Facilities

The Homeowner's Guide to Retrofitting provides a list of methods to retrofit a structure to reduce flood risk and damage from floods: elevation, relocation, demolition, wet floodproofing, dry floodproofing, and barrier systems. The guide provides backgrounds on these retrofitting methods and the advantages and disadvantages of the different methods (FEMA 2014).

Elevating a structure (see Figure 5-13) has the advantage of reducing the flood risk to a structure and its contents and brings a structure into compliance with local floodplain management regulations. However, elevating a structure may be cost-prohibitive and may adversely affect appearance and access (FEMA 2014).

Sometimes a structure cannot be elevated, and FEMA has developed the FEMA P-1037 Reducing Flood Risk to Residential Building that Cannot Be Elevated guide to assist property owners with ways to retrofit their property to reduce their flood risk if their structure cannot be elevated. Some of the retrofitting measure listed include interior modification measures like basement infill (see Figure 5-14) or abandon lowest flood, wet floodproofing like elevating building utilities (see Figure 5-15) or using flood resistant materials, dry floodproofing, and barriers (FEMA 2015a).

Flood mitigation doesn't have to be expensive to reduce a property's flood risk, and these can often be done by property owners (FEMA n.d.-b). Property owners can improve the drainage around their property so that the runoff from rainfall can be stored or drained away from the structures (FEMA n.d.-b). Mitigation measures that can improve drainage on a property include improving lot grading to allow runoff to drain away from the structure, installing a French drain to move runoff away from a structure, installing rain gardens (see Figure 5-11) and detention basins to hold the runoff, and installing rain barrels to collect runoff from structures that can be used or released later (Reduce Flood Risk n.d.-d). Mitigation measures that can be done within the home include moving

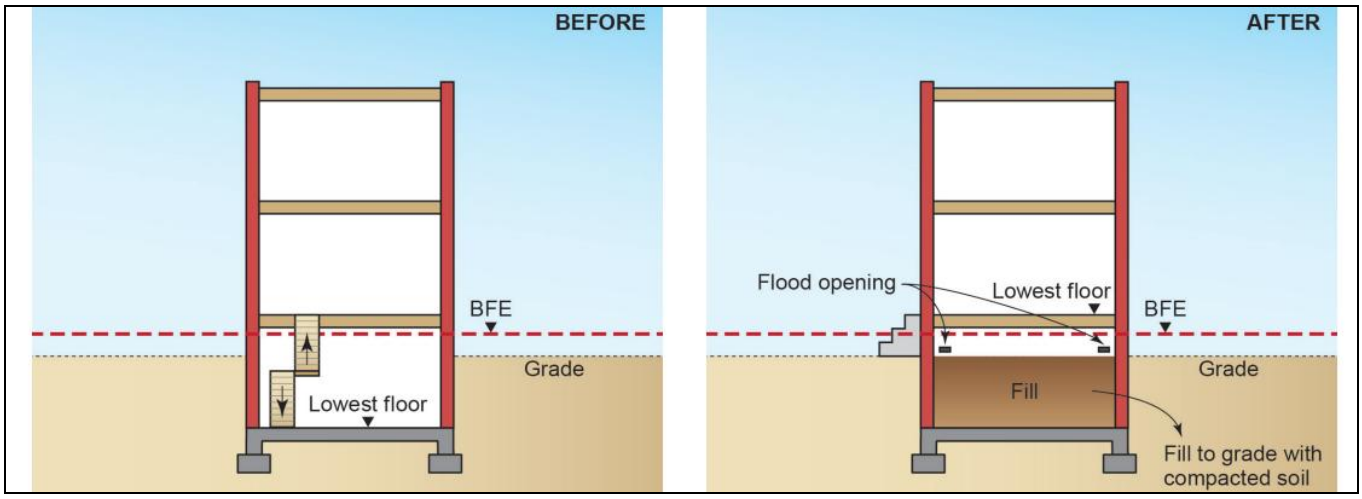
valuable possessions and important documents to a safer location, sealing the foundation and basement wall, installing sump pumps and sewer backflow valves, and raising or protecting utility equipment (FEMA n.d.-b) (Reduce Flood Risk n.d.-d).

Figure 5-13. Example Structure Elevation; Elevation on Foundation Walls Before (left) and After (right)



Source: (FEMA 2014)

Figure 5-14. Basement Infill



Source: (FEMA 2015a)

Figure 5-15. Elevated Utility Equipment



Source: (FEMA 2014)

Actions: Property owners are encouraged to research property maintenance projects that may reduce flood risk and support watershed-wise rainwater collection. Property mitigation actions may require a local permit before starting any work. Property owners are encouraged to communicate with their community's building department before starting any work. Property-focused flood risk reduction projects will be unique to the property and the water-based issues it may be experiencing. Localized flooding is a common problem statement within the RLAA. Orange County communities are proactive in identifying and implementing flood reduction efforts through initiatives such as higher regulatory standards, stormwater management, watershed management, Capital Improvement Plans and planning efforts that may support grant funding projects.

Private or grant funded mitigation projects such as structural elevation may be eligible for CRS Activity 530, Flood Protection credit. This activity is based on retrofitting techniques and/or structural techniques used for protecting buildings from flood risk. This activity is focused on existing buildings and site-specific flood risk reduction techniques.

2025 FEMA CRS Coordinator's Manual, Activity 530-3 identifies flood protection retrofitting projects, such as elevating buildings above predicted flood levels, dry floodproofing, wet floodproofing, protecting basements from sewer backup, and barriers (for individual structures only) such as, levees, berms, and floodwalls. It also identifies structural flood control projects, such as elevating buildings above predicted flood levels, channel modifications, including enlarging bridges and culverts; storm drain improvements, including enclosing open channels; diversions and other structural projects; and small reservoirs, including retention and detention basins.
California offers grant programs that provide financial assistance to elevate homes and structures located in flood-prone areas. Elevating buildings helps reduce flood damage by raising them above predicted flood levels. These grants are often funded through federal programs like FEMA's Hazard Mitigation Grant Program (HMGP) and state initiatives aimed at flood risk reduction. The grants typically cover costs related to engineering, construction, and permitting to help homeowners and communities improve resilience against flooding.

California buyout programs provide funding to purchase properties located in flood-prone or high-risk areas, with the goal of permanently removing structures from harm's way. These programs, often supported by federal funds like FEMA's HMGP and state resources, help reduce flood risk by converting bought-out properties into open space, wetlands, or natural floodplains. Buyouts reduce future flood damage, improve environmental resilience, and enhance community safety by preventing redevelopment in vulnerable zones.

Community and Public Resources:

- Orange County Public Works | https://www.ocpublicworks.com/
- ASFPM Reduce Flood Risk | https://www.reducefloodrisk.org/
- SoCal Water$mart | https://socalwatersmart.com/en/residential/rebates/available-rebates/rain-barrels-cisterns/
- H20CStormwater Program | https://h2oc.org/rainsmart/

5.1.4 Natural Resource Protection

Natural resource protection activities preserve or restore natural areas or the natural functions of floodplains and watershed areas (FEMA 2025). These activities include wetland protection, erosion and sediment control, natural

area preservation and restoration, and water quality improvements (FEMA 2025). Many different agencies and organizations can undertake these activities including parks and recreation departments and conservation agencies (FEMA 2025).

Floodplains in their natural state provide benefits that are lost when the floodplain is developed. These benefits include fish and wildlife habitat protection, natural flood and erosion control, surface water quality maintenance, groundwater recharge, biological productivity, and recreational opportunities (FEMA 2024a). Floodplains provide a habitat to a variety of species (both plant and animal) including endangered species, and preserving or restoring the natural state of the floodplains conserves and protects the different species and allows them to thrive (FEMA 2024a). Protecting and restoring the natural state of floodplains also provides areas for recreation that the public can use (FEMA 2024a).

Natural floodplains allow floodwaters to spread out and be temporarily stored (FEMA 2024a). This spread of the floodwaters and natural vegetation located within the floodplain can help reduce the peak and velocity of the floodwaters, which can lead to a reduction in erosions rates along the shoreline (FEMA 2024a). This combination of flood water storage, reduction in flood peak and velocity, and reduction in erosion rates can help reduce the risk of flooding to nearby structures, with floodwaters mostly contained within the floodplain and potentially prevented from reaching structures. (FEMA 2024a). Natural floodplains also slow runoff by allowing water to pond, infiltrate, recharge groundwater, and filter pollution to improve water quality (FEMA 2024a).

CRS Activity 510 Floodplain Management Planning

The CRS program provides credits for communities that develop plans that show the flood hazards and identify measures to help mitigate the impacts of flooding. These plans are credited under CRS Activity 510 Floodplain Management Planning elements, such as Floodplain Management Plan (FMP), Repetitive Loss Area Analysis (RLAA), Natural Floodplain Functions Plan (NFP), and Substantial Damage Management Plan (SDP) (FEMA 2025). The 2025 Community Rating System Coordinator's Manual provides a detailed explanation of these plans and the elements required to collect points under this activity (FEMA 2025).

Floodplains benefit the environmental, social, and economic aspects through natural functions. Disruptions of these natural functions can have long-term consequences on entire regions. Some of the water-related functions of floodplains include:

- Fish and wildlife habitat protection;
- Biological productivity;
- Natural flood and erosion control;
- Surface water quality maintenance; and
- Groundwater recharge (FEMA 2024a) (FEMA 2025).

The Natural Floodplain Functions Plan (NFP) element provides a maximum of 100 points for plans that protect one or more natural functions within the community's floodplain (FEMA 2025). The 2025 Community Rating System Coordinator's Manual provides examples of plans that can be used to collect points for the NFP element. These plans include a habitat conservation plan which explains and recommends actions to protect rare, threatened, or endangered species that live in the floodplain; a green infrastructure plan that identifies open space corridors, connected wetlands, or natural areas that support native species, maintain ecological processes, and sustain water resources; or a floodplain species assessment that identifies the threatened and endangered species that have critical habitat within the community's floodplain and contains actions to support conservation or recovery of the identified species (FEMA 2025).

The NFP element has the following credit criteria which plans must meet to be eligible under this element. The credit criteria for the NFP element are listed below (FEMA 2025):

1. For NFP1:
   a. A plan for NFP1 credit must include a comprehensive inventory of the natural floodplain habitat within the community.
   b. It must identify areas that warrant protection or preservation in order to maintain fully functioning habitat for the species of interest.
   c. Where threatened or endangered species are present, each species must be addressed, and a restoration plan must be included.
2. For NFP2:
   a. This sub-element credits other plans that meet the credit criteria listed in (1), but that do not address the entire SFHA or all the species present. These could be a single-issue or single species plan or plans that cover only one area of the community's floodplain.
3. For Floodplain Species Assessment (FSA):
   a. This sub-element credits an FSA, which identifies all threatened and endangered species that have been listed or proposed for listing by the U.S. Fish & Wildlife Service or the National Marine Fisheries Service and that have any range or critical habitat within the community. The FSA also relates their locations to the floodplain, and reviews current and feasible conservation and recovery actions that could receive credit.
   b. The draft document must be circulated to federal, state, and private organizations that have expertise in protecting threatened and endangered species.
   c. A floodplain species assessment must meet credit criteria (1)(a), (c), and (e).
4. For Floodplain Species Plan (FSP):
   a. This sub-element credits taking another step after an FSA and adds action items to incorporate conservation and recovery actions identified in the FSA.
   b. The FSP is not necessarily required to address the full inventory of all threatened and endangered species, but must address the comments and recommendations from the reviewers of the FSA.

CRS Activity 510- Natural Functions Plans (NFP1)
NFP1 credit is provided for adopting plans that protect one or more natural functions within the community's floodplain.

While the maximum credit for the NFP element is 100 points, each of the four listed NFP sub-elements (NFP1, NFP2, FSA, and FSP) have individual credits. NFP1 provides a full 100 credits for a plan or combination of plans that meet credit criteria (1) and (2) while covering the entire SFHA within the community. NFP2 provides a maximum of 60 credits for plans that meet credit criteria (1). The credits for NFP2 are calculated by multiplying the number of credited plans (up to four plans) by 15. The FSA provides 15 credits for preparing and circulating a floodplain species assessment. The FSP provides 85 credits for preparing and adopting a floodplain species plan.

Orange County has several regional plans which help to manage water resources within its jurisdiction. The county has two Integrated Regional Management (IRWM) groups (OCPW n.d.-b):

- The North Orange County IRWM group which covers the northern and central part of the county and includes communities, governmental agencies (federal, state, and local levels), and stakeholder with a focus on all aspects of water resources across multiple sectors (North OC IRWM n.d.).

- The South Orange County IRWM group which covers the southern portion of the county and includes communities, governmental agencies (federal, state and local levels), and stakeholders with a focus on all aspects of water resources across multiple sectors (South OC IRWM n.d.).

These IRWM groups develop their own plans to manage water resources within their respective regions. The goal of these plans is to enhance water supply, protect water quality, preserve the environment and natural habitats, and provide effective flood risk management. Additionally, the plans include historical background information on the county's watersheds, descriptions of natural habitats, issues affecting the watersheds, and strategies for resource management and implementation.

The Santa Ana Watershed Project Authority is an organization like the North Orange County IRWM and South Orange County IRWM groups, that handles the water resources for the Santa Ana watershed (Santa Ana Watershed Project Authority n.d.-a). The Santa Ana watershed covers 2,840 square miles and includes Orange County, Riverside County, San Bernardino County, and a small portion of Los Angeles (Santa Ana Watershed Project Authority n.d.-a). The Santa Ana Watershed Project Authority has created the One Water One Watershed Plan that was adopted in 2019 to manage water resources within the Santa Ana Watershed (Santa Ana Watershed Project Authority n.d.-a). This plan, similar to those developed by the Orange County IRWM groups, includes a description of the watershed, its associated issues, species and habitats, as well as strategies for resource management and implementation.

Table 5-3 describes plans in Orange County which address natural floodplain functions and have the potential to obtain credit under the NFP element for CRS Activity 510.

Table 5-3. Plans that Address Natural Floodplain Functions in Orange County

Plan	Date of Adoption	Pages of Species/Habitat and Action Items
Integrated Regional Water Management for the North and Central Orange County Watershed Management Areas	2018 Appendix A of the report noted that the Orange County Water District, Orange County Sanitation District, and County of Orange are the representing agencies who have adopted the plan.	The habitat and list of species in the riparian ecosystem is listed in Section 2. The list of wildlife is listed in Section Wildlife Appendix F has a list of projects in the planning area and the goals of the plan that is addresses. The projects include City of Fullerton – West Coyote Hills Land Acquisition and Protection.
South Orange County Watershed Management Area 2018 Integrated Regional Watershed Management Plan	2018 Appendix D has the resolutions of adoption for the participating agencies, including Cities, Water Districts, and the County of Orange	The watershed and habitats are listed in Section 3 Regional Description. The strategies for protecting and/restoring the natural floodplain are listed in Section 4.3.4 Protect Natural Resources and Objectives and Strategies. Appendix F has the list of projects.
One Water One Watershed Plan Update 2018	2019 Appendix A shows the timeline of the planning process and lists a SAWPA commission meeting to adopt the 2018 plan on February 19, 2019.	The habitats and species located in the Santa Ana Watershed are listed in Section 4.1.5 Open Space, and Native Species. Appendix F lists the projects for the plan and the goal the project addresses. The goal and objects for addressing that natural floodplain is listed in Section 3.2 Goals and Objectives

CRS Activity 510- Floodplain Species Assessment (FSA)
Credits a floodplain species assessment that identifies all threatened and endangered species that have been listed or proposed for listing by the U.S. Fish & Wildlife Service or by the National Marine Fisheries Service and that have range or critical habitat anywhere within the community

To qualify for the FSA credits, a floodplain species assessment must identify all threatened and endangered species that have been listed or proposed to be listed by the U.S. Fish & Wildlife Service or by the National Marine Fisheries Service and that have range or critical habitat within the community and floodplain. Information about the threatened or endangered species can be obtained through several tools created by the U.S. Fish & Wildlife Service and National Marine Fisheries Service. The National Marine Fisheries Service created the Endangered Species Act Critical Habitat Mapper to assist the public and government agencies in viewing the critical habitats that were designated and proposed by NOAA Fisheries (NMFS n.d.). In addition to the National Marine Fisheries Service tool, the U.S. Fish and & Wildlife Service has the Information for Planning and Consultation tool to allow individuals to see if any threatened or endangered species, critical habitat, migratory birds, or other natural resources may be impacted by any development project (USFW n.d.). In addition to the federal resources, the California Department of Fish and Wildlife also has information about threatened and endangered species and habitats; this information can be used to understand where critical habitats and threatened and endangered species are located within California (CDFW n.d.).

The 2018 Integrated Regional Water Management for the North and Central Orange County Watershed Management Areas plan noted that 20 federal and state endangered and threatened species wildlife species have been identified as having historical, current, or potential occurring range within Orange County (North OC IRWM n.d.). Of the 20 species, the plan specifically calls out four species that can only survive in riparian ecosystems (North OC IRWM n.d.). These species include the California Least Tern, the Southwestern Willow Flycatcher, the Least Bell's Vireo, and the Belding's Savannah Sparrow (North OC IRWM n.d.). The plan also noted that two endangered species, the Light-footed Clapper Rail and the California Least Tern, have been observed in the Upper Newport Bay (North OC IRWM n.d.).

CRS Activity 420 Open Space Preservation

CRS Activity 420- Open Space Incentives (OSI)
Credits local requirements and incentives that keep flood-prone portions of new development open

CRS Activity 420 Open Space Preservation (OSP) provides credit for preserving open space in the community (FEMA 2025). The objective of Activity 420 OSP is to prevent and/or minimize development in the regulatory floodplain that obstructs floodwaters; exposes buildings to damage; is subject to erosion or other flood-related hazards; or adversely affects water quality, water quantity, or other floodplain functions (FEMA 2025). Preserving open space within the floodplain supports the natural floodplain functions in three ways:

1. Open space is more effective at controlling or attenuating flooding and is less expensive over the long run compared to traditional manmade flood control structures.
2. Local officials and their constituents who are aware of the benefits that naturally functioning floodplains provide to their communities want to protect them. This can generate a continuous level of interest in protecting floodplains to support local economies or improve recreational opportunities. This interest level persists between infrequent floods, adding to the attention and resources available for flood loss reduction efforts.
3. Disrupting natural features has adverse impacts on the flooding regime (FEMA 2025).

CRS Activity 420 OSP also provides credit under the Open Space Incentives (OSI) element for communities that have tools which encourage property owners to preserve the floodplain as open space after the site is developed. These tools can include the following (FEMA 2025):

- Density transfers
- Transfer of development rights
- Bonuses for avoiding the floodplain or other sensitive areas
- Planned unit development
- Cluster development
- Greenway and setback rules
- Open space ratio credits for open space in the floodplain (FEMA 2025)

Under the OSI element, OSI7 provides 10 points if a community's land use plan recommends open space use or low-density development of flood-prone areas. Orange County has a General Plan with two elements that address using open space within the community. The Land Use element of the General Plan contains Orange County's official policies on the location and character of land uses necessary for orderly growth and development. The Land Use element includes both an Open Space category and Open Space Reserve category that lists the building intensity, uses, and density standards for developing in these zones. In addition to the Land Use element, open space is also listed in the Resource element of the General Plan. The Resource element contains Orange County's official policies for the conservation and management of resources which also includes open space. The open space in Orange County is generally represented by beaches, harbors, urban national forest, and natural areas that house unique wildlife habitat (both land and aquatic) and vegetation. The role of open space within the county is to preserve natural resources, to productively manage these natural resources, to protect the public from hazardous areas or conditions, and to provide areas for outdoor recreation (OCPW n.d.-a).

In addition to the General Plan, Orange County has a Strategic Plan developed by the Parks Department which also addresses open space. The 2018 Strategic Plan builds upon the 2007 Strategic Plan, which identified the stewardship of open space as one of the key issues addressed. The 2018 Strategic Plan also noted that in the 10 years between these plans the county expanded its regional park system by adding more than 22,000 acres of open space, mapping 25,000 acres of open space vegetation, and completing over 400 acres of habitat restoration. The 2018 Strategic Plan also lists the goals and objectives that the Parks Department wishes to advance and includes priority actions for the next 10 years which include investing in habitat restoration/environmental sustainability and purchase/acquire additional parks and open space (OC Parks 2018).

Actions: The community should continue to promote natural resource protection through CRS Activities 420 and 510. A detailed review of the existing watershed plans can determine if there are creditable activities under Natural Floodplain Functions Plan (NFP) elements NFP1 and NFP2. The feasibility of completing a FSA and FSP can be evaluated by determining the endangered and threatened species within each community using publicly available tools from the U.S. Fish & Wildlife Service or the National Marine Fisheries Service.

Community and Public Resources:

- IPaC Information for Planning and Consultation | IPaC: Home
- Species Directory | Species Directory - ESA Threatened & Endangered | NOAA Fisheries

5.1.5 Emergency Services

Emergency services activities are measures taken during an emergency to minimize its impacts. These measures include hazard threat recognition, hazard warning, hazard response operations, critical facilities protection, health and safety maintenance, and post-disaster mitigation actions. These activities are usually undertaken by a community's emergency management staff and the owners or operators of major critical facilities (FEMA 2025).

The emergency response for unincorporated Orange County is handled by the Orange County Sheriff's Department and the Orange County Fire Authority (OC Fire Authority n.d., OC Sheriff's Department n.d.-a). The Emergency Management Division for Orange County is part of the Sheriff's Department and has partnered with Orange County Fire Authority to develop the 2021 Orange County Hazard Mitigation Plan (OC Sheriff's Department n.d.-b) (OC Sheriff's Department 2021). The Orange County Public Works Department maintains the Orange County Automated Local Elevation in Real Time (ALERT) warning system which consist of 85 sites which have sensors that measure various meteorological and hydrological variables including precipitation, water levels in channels, temperature, and windspeed and direction (OC Public Works n.d.-a). The Orange County Public Works Department uses the information from this network to make timely decisions during storm events to protect the public (OC Public Works n.d.-a). The Infrastructure Programs division of the Orange County Public Works Department is responsible for the flood protection for the unincorporated Orange County (OC Public Works n.d.-d). Finally, Orange County has the AlertOC mass notification system that is designed to inform the residents and businesses of Orange County of emergencies that may impact lives and safety (Orange County n.d.).

The emergency response for the City of Newport Beach is handled by the Newport Beach Police Department and the Newport Beach Fire Department (Newport Beach Police Department n.d.) (Newport Beach n.d.-c). The city has an emergency management program that works with other city departments to strengthen the city's ability to prepare for, respond to, recover from, and mitigate the effects from disaster and the Newport Beach Police Department is the lead department that coordinates all the emergency management activities of city (Newport Beach n.d.-b). The emergency management program contains the city's evacuation maps, the emergency operations plan, and hazard mitigation plan (Newport Beach n.d.-b). Finally, the City of Newport Beach uses AlertOC as their mass notification system and has three sirens strategically placed along the coast that are activated for any impending emergency to provide warnings to the nearby population (Newport Beach n.d.-b). The City of Newport Beach also has a Community Emergency Response Team (CERT) program that trains volunteers to help promote disaster preparedness and assist in disaster response within the scope of their training during activation (Newport Beach n.d.-a).

The emergency response for the City of San Juan Capistrano is handled by the Orange County Sheriff's Department and the Orange County Fire Authority (San Juan Capistrano n.d.-d) (San Juan Capistrano n.d.-b). The City of San Juan Capistrano has an emergency management program that allows the city to respond to disasters, and city employees are trained in the National Incident Management System that allows them to manage emergencies and work with various agencies and groups (San Juan Capistrano n.d.-a). The city uses AlertOC for its mass notification system and has a published evacuation map (San Juan Capistrano n.d.-a). The City of San Juan Capistrano also several volunteer teams to assist in emergencies. These include the CERT program which is a program to increase the preparedness and self-reliance of individuals and the community in the face of emergency and to provide volunteers that can assist in the emergency response, the Large Animal Rescue Team which provides training on and assistance in evacuating large animals during emergencies, and the Radio Amateur Civil Emergency Services which is a team of amateur radio operators that assist during emergencies (San Juan Capistrano n.d.-a).

The emergency response for the City of Santa Ana is handled by the Santa Ana Police Department and the Orange County Fire Authority (Santa Ana n.d.-d) (Santa Ana n.d.-c). The City has an emergency management

program to allow the City to respond to emergencies and this program is part of the Homeland Security Division of the Santa Ana Police Department (Santa Ana n.d.-b). The emergency management program includes the hazard mitigation plan for the City and the CERT program that teaches residents about disaster preparedness and basic disaster response skills (Santa Ana n.d.-b). The City of Santa Ana also uses AlertOC as the mass notification system for emergencies (Santa Ana n.d.-b).

Actions: Community floodplain managers should engage with local emergency managers to determine if any existing activities can earn credit under CRS Activity 600 – Warning and Response. This includes threat recognition, emergency warning services, flood response, critical facilities planning, and levee and dam failure. The communities should research if they are eligible to become designated as a StormReady and TsunamiReady community under the National Weather Service program.

Community and Public Resources:

- Orange County Emergency | Emergency | Orange County
- Orange County Fire Authority | Home - OCFA
- Orange County Sheriff's Department | OC Sheriff's Department, CA | Orange County California
- AlertOC | AlertOC
- Newport Beach Police Department | Newport Beach Police Department | Home
- Newport Beach Fire Department | Fire Department | City of Newport Beach
- Newport Beach Community Emergency Response Team | Community Emergency Response Team (CERT) | City of Newport Beach
- Santa Ana Police Department | Police - City of Santa Ana
- National Weather Service StormReady Program | StormReady
- National Weather Service TsunamiReady Program | TsunamiReady

5.1.6 Structural Projects

Structural projects keep flood water from an area with a levee, reservoir, or other flood control measure (FEMA 2025). These projects are designed by engineers and managed or maintained by public works staff (FEMA 2025). Orange County has 380 miles of flood control facilities designed to convey flood waters in to the Pacific Ocean. The Orange County Flood Control District (OCFCD) was created in 1927 to protect Orange County areas from the threat and damage from flooding. Orange County Public Works, on behalf of OCFCD, is responsible for maintaining these flood control structures. (OC Public Works n.d.-g). Since the creation of the NFIP, the goal of the OCFCD is to reduce the floodplain within the OCFCD infrastructure by constructing flood control channels that provide 100-year flood protection and constructing retarding basins, pump stations, and dams throughout the County (OC Public Works n.d.-b). Figure 5-167 shows the watersheds and the OCFCD flood control facilities in the County and Figure 5-17 shows the OCFCD drainage facilities in an example watershed.

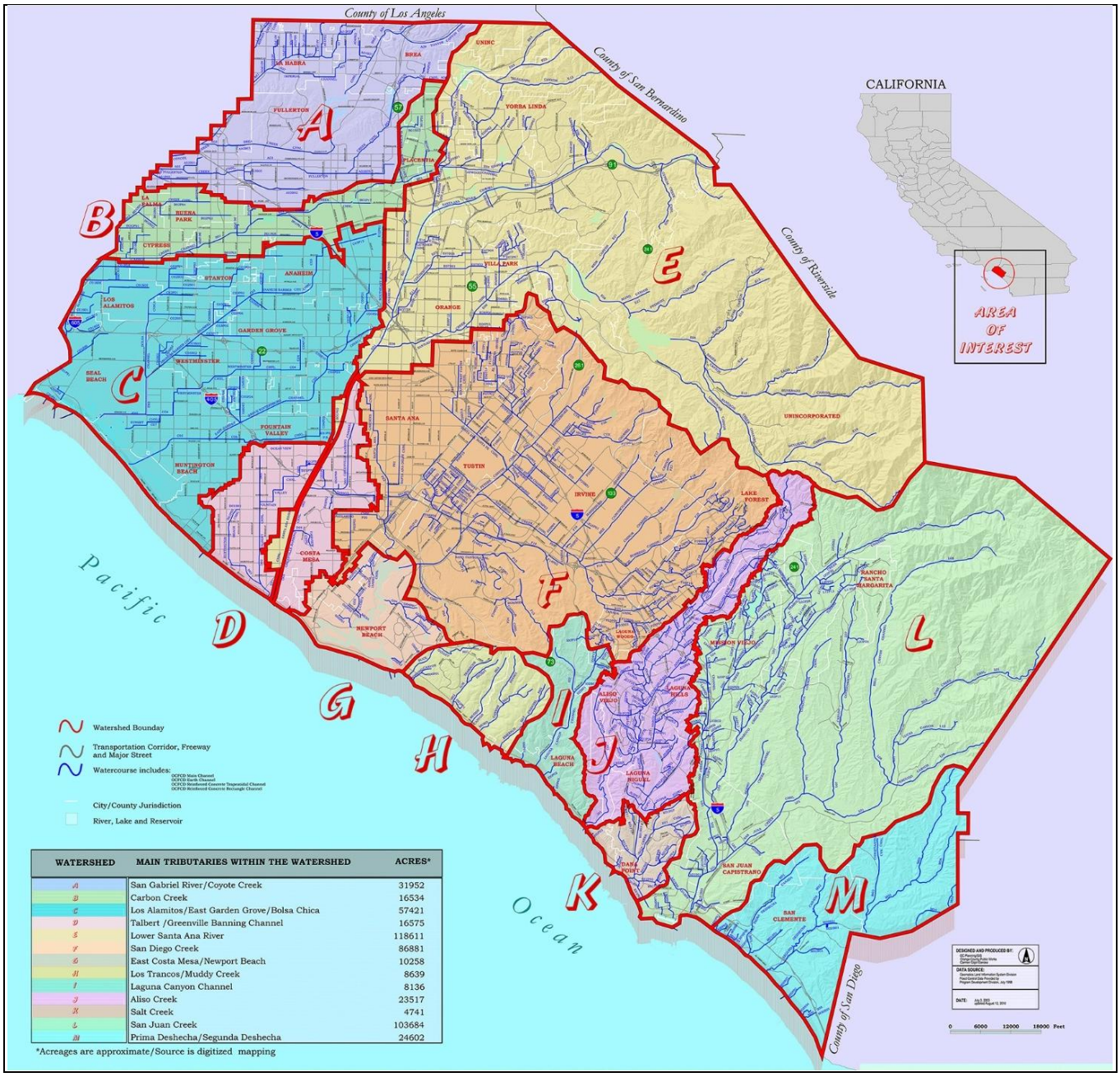
Orange County Public Works 2024-25 to 2030-31 Capital Improvement Program (CIP) includes 18 flood control projects intended to increase the overall capacity and efficiency of conveying flows through OCFCD's flood control facilities (Table 5-). Funding for these projects is generated by property tax revenues, except for CIP project number 12, which is partially funded through Orange County Transportation Authority's 'Measure M' fund. All project costs listed are fully funded based on projected property tax revenue projections over the 7-year CIP time horizon.

Table 5-4. Orange County Public Works Flood Control Projects – 2025-26 to 2031-32 Capital Improvement Program Summary

CIP Project Number	Flood Control Project Name	Project Description	7-Year CIP Cost
1	Bolsa Bay Outlet Flood Control Improvements	Improving the flood control facility to convey a 100-year storm	$49,580,000
2	Carbon Creek Channel (B01)	Reconstructing the existing trapezoidal earthen rip rap channel per assessment report, allowing the channel reach to convey a 100-year storm.	$22,955,000
3	Carbon Creek Channel (B01	Reconstructing the existing trapezoidal earthen rip rap channel per assessment report, allowing the channel reach to convey a 100-year storm	$24,494,000
4	East Garden Grove-Wintersburg Channel (C05)	Reconstructing the existing trapezoidal earthen rip rap channel to a concrete rectangular channel, allowing the channel reach to convey a 100-year storm	$3,067,000
5	East Garden Grove-Wintersburg Channel (C05)	Reconstructing the existing trapezoidal earthen rip rap channel to a concrete rectangular channel, allowing the channel reach to convey a 100-year storm	$2,580,000
6	East Garden Grove-Wintersburg Channel (C05)	Reconstructing the existing trapezoidal earthen rip rap channel to a concrete rectangular channel, allowing the channel reach to convey a 100-year storm	$2,124,000
7	East Garden Grove-Wintersburg Channel (C05)	Improving the flood control facility to convey a 100-year storm	$75,275,000
8	East Garden Grove-Wintersburg Channel (C05)	Reconstructing the existing trapezoidal earthen rip rap channel to a concrete rectangular channel, allowing the channel reach to convey a 100-year storm	$5,602,500
9	East Garden Grove-Wintersburg Channel Bridges (C05)	Modify the three bridge structures along C05 facility to remove the hydraulic constriction caused by upstream channel improvements.	$70,000
10	Fullerton Creek Channel (A03)	Reconstructing the existing trapezoidal concrete lined channel and constructing concrete U-channel to convey a 100-year storm	$16,124,000
11	Ocean View Channel Segments Improvements	Design and construction of improvements to the Ocean View Channel systems as part of the Interstate 405 Improvement Project.	$1,000,000
12	OC Debris Boom Project	Installation of new floating debris booms at the following OCFCD channels: Coyote Creek Channel (A01), Imperial Channel (A07), Carbon Creek Channel (B01), and Santa Ana Delhi Channel (F01).	$700,000
13	Preliminary Project Development	Services in support of future Flood CIP Projects	$2,600,000
14	San Juan Creek Channel (L01)	Bridge replacement and channel improvements, allowing the channel reach to convey a 100-year storm	$40,425,000
15	San Juan Creek Channel (L01)	Reconstructing the existing trapezoidal channel into a rectangular channel with drop structure(s), allowing the channel reach to convey a 100-year storm	$61,392,000
16	San Juan Creek Channel (L01)	Retrofitting the existing sheet piles to accommodate conversion into a rectangular channel with drop structure(s), allowing the channel reach to convey a 100-year storm	$28,227,500
17	Santa Ana-Delhi Channel (F01)	Widening portions of the channel to create additional habitat area, restoring channel slopes to convey a 100-year storm event, and replacing the existing bicycle bridge to allow continued coastal access	$69,552,917
18	Santa Ana River Channel Reach 5 Levee Height Correction (E01)	Correcting the west levee height along E01 from the limits provided.	$4,150,000

Source: (OCPW 2025)

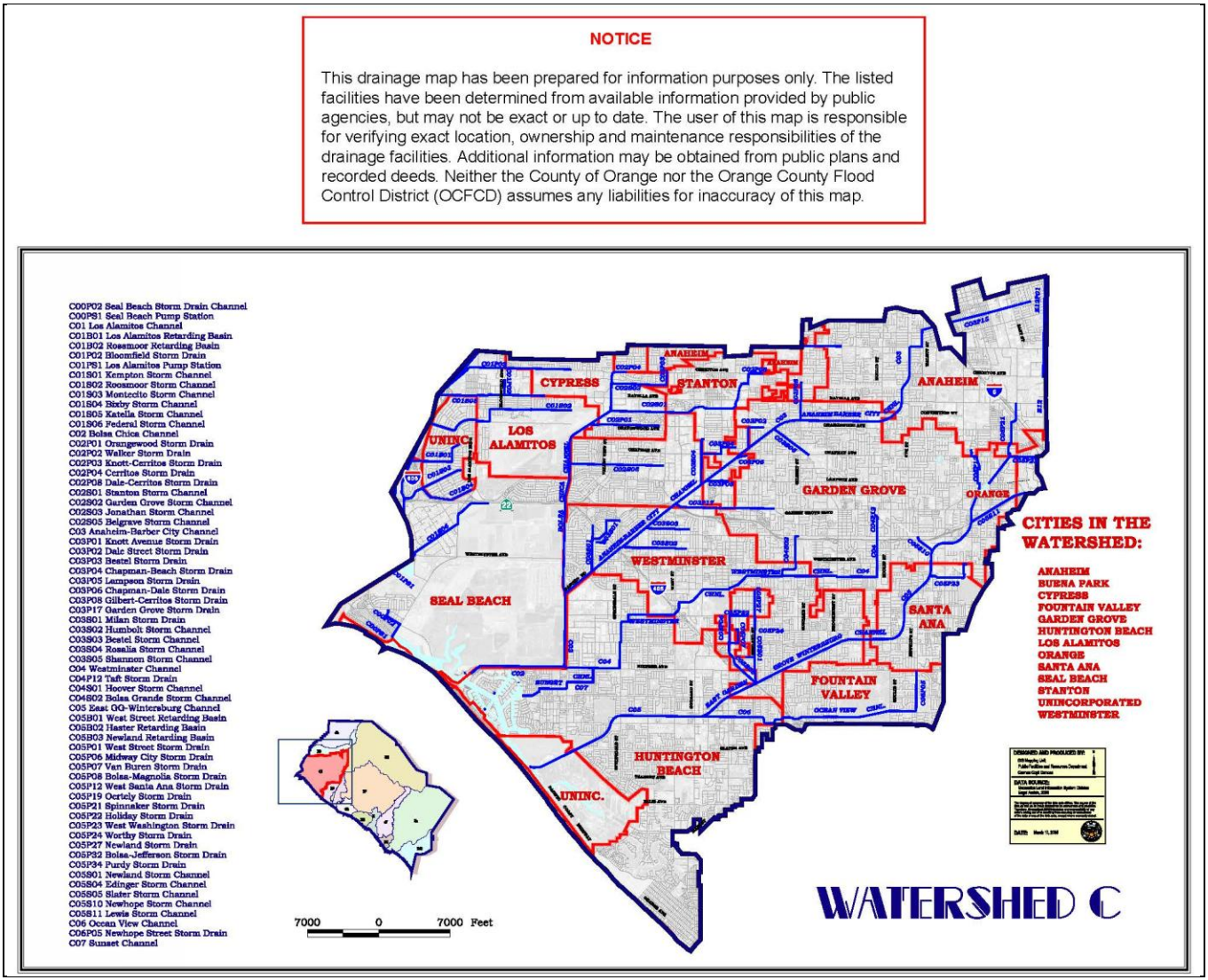
Figure 5-16. Orange County Watershed Drainage Map



WATERSHED	MAIN TRIBUTARIES WITHIN THE WATERSHED	ACRES*
A	San Gabriel River/Coyote Creek	31952
B	Carbon Creek	16534
C	Los Alamitos/East Garden Grove/Bolsa Chica	57421
D	Talbert /Greenville Banning Channel	16575
E	Lower Santa Ana River	118611
F	San Diego Creek	86881
G	East Costa Mesa/Newport Beach	10258
H	Los Trancos/Muddy Creek	8639
I	Laguna Canyon Channel	8136
J	Aliso Creek	23517
K	Salt Creek	4741
L	San Juan Creek	103684
M	Prima Deshecha/Segunda Deshecha	24602

Source: (OC Public Works n.d.-e)

Figure 5-17. Orange County Watershed C Drainage Map



Source: (OC Public Works n.d.-e)

Actions: Continue to plan and seek funding for structural flood control projects primarily through the Capital Improvement Program. These projects can reduce flood risk through a variety of methods including repair, maintenance, replacement of hydraulic structures including bridges and culverts.

Community and Public Resources:

- Orange County Public Works | OC Public Works | Orange County | California
- Orange County Flood Control | Flood Control Project Process | OC Infrastructure Programs California
- Orange County Flood Protection Information | Flood Protection Information | OC Infrastructure Programs California
- Orange County Capital Improvement Program | Capital Improvement Program | OC Public Works: Orange County California

5.1.7 Public Information

Public Information activities educate 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 (FEMA 2025). These activities include map information, outreach projects, real estate disclosure, library, references, technical assistance, and environmental education, and they are usually implemented by the public information office (FEMA 2025).

Orange County Public Works handles the floodplain management for unincorporated County (OC Public Works n.d.-c). Orange County Public Works' website provides resources on flood safety and protection, flood insurance information, FEMA floodplain maps, and links to rainfall and flood data, including the local National Weather Service office (OC Public Works n.d.-f). While the information on the Orange County Public Works' website is mainly focused on flooding, Orange County has another resource that provides information on preparing for emergencies and both manmade and natural disasters.

The ReadyOC website is a public outreach effort aimed at educating and empowering Orange County residents, businesses, and the community to better prepare for emergencies (ReadyOC n.d.). The resources provided on the ReadyOC website include an overview of natural and manmade disasters, how to prepare an emergency kit, and how prepare a plan based on specific needs such as for families, seniors, and people with disabilities (ReadyOC n.d.).

The Association of State Floodplain Managers developed the Reduce Flood Risk website to help property owners understand flood mitigation measures and resources can be implemented for a specific property (ASFPM n.d.). The public can explore mitigation strategies based on whether someone is a property owner or buyer, renters, community association representative, government, or anyone else with an interest in understanding flood mitigation measures (ASFPM n.d.). Users can filter mitigation measures based on variety of factors, including the amount of required annual maintenance, relative cost, level of effort (DIY vs. professional), scale, foundation type, and others (ASFPM n.d.).

Actions: Continue to promote mitigation measures on Orange County Public Works, ReadyOC, and outside agencies websites. Consider holding workshops for property owners on topics such as flood reduction property maintenance, retrofitting, drainage improvements, flood insurance, and other mitigation measures. Offer guidance documents on these topics and post them on websites and have copies in local offices to provide to property owners and other stakeholders.

Community and Public Resources:

- Orange County Public Works | OC Public Works | Orange County | California
- ReadyOC | ReadyOC
- Association of State Floodplain Managers Reduce Flood Risk | https://www.reducefloodrisk.org/

5.2 MITIGATION ALTERNATIVES CONSIDERED

This section provides mitigation measure alternatives for the RL areas identified in Section 4.

For CRS purposes, each CRS participating community in the RLAA maintains their CRS Activity 502 RL area mailing inventory. For reporting purposes, an aggregate mapping and data approach was utilized for the RLAA, RLA mapping, and building stock inventory. The RL areas in the RLAA are larger in comparison to the community's RLA area mailing inventory.

The below presents a separate analysis for each of the identified repetitive loss areas found within the four participating communities and lists the potential mitigation measures to address repetitive flooding problems for each. This section summarizes the alternatives that were identified for consideration. These mitigation measures can be implemented by the local government, homeowners, or other entities. The selection of measures for each at-risk property is described in the sections which present the individual repetitive loss area analyses. It is important to note that many types of flood hazard mitigation strategies exist and there may not be one mitigation measure that fits every case, or even most cases. Successful mitigation often requires multiple strategies. The 2025 CRS Coordinator's Manual (FEMA CRS 2025) describes the primary types of mitigation as follows:

- **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, and/or code enforcement offices.
- **Property protection activities** are usually undertaken by property owners on a building-by- building or parcel basis.
- **Natural resource protection activities** preserve or restore natural areas or the natural functions of floodplain and watershed areas. They are implemented by a variety of agencies, primarily parks, recreation, or conservation agencies/organizations.
- **Emergency services** are measures 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 or critical facilities.
- **Structural projects** keep floodwater away from an area with a levee, reservoir, or other flood control measures. They are usually designed by engineers and managed or maintained by public works staff.
- **Public information activities** advise property owners, potential property owners, and visitors about hazards and ways to protect people and property from them, as well as the natural and beneficial functions of local floodplains. They are usually implemented by a public information office.

5.2.1 Unincorporated Orange County RLA1 Mitigation

In addition to the single RL property, an additional 510 structures were identified in RLA1 for Unincorporated Orange County. Probable mitigation measures for the structures located in RLA1 apply to both the RL designated property and the non-RL designated properties based on the identified flooding source of runoff from adjacent higher ground properties. Data suggests that the most common structure for this RL area is a single-family residential structure that is single story with either a slab or crawlspace foundation.

Table 5-5. Unincorporated Orange County RLA1 Mitigation Measures

Foundation	Probable Mitigation Measures
Crawl Space—Common foundation type in RLA1	Elevation and drainage improvement: Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations.

Foundation	Probable Mitigation Measures
	Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Slab—Common foundation type in RLA1	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with NFIP and local floodplain management regulations. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow value on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Basement—Foundation type not common in RLA1	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
All Foundation Types	Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.2.2 Unincorporated Orange County RLA2 Mitigation

In addition to the single RL property, an additional 799 structures were identified in RLA2 for Unincorporated Orange County. Probable mitigation measures for the structures located in RLA2 apply to both the RL designated

property and the non-RL designated properties based on the identified flooding source of runoff from adjacent higher ground properties and poor interior drainage. Data suggests that the most common structure for this RL area is a single-family residential structure that is single story with either a slab or crawlspace foundation.

Table 5-5. Unincorporated Orange County RLA2 Mitigation Measures

Foundation	Probable Mitigation Measures
Crawl Space—Common foundation type in RLA2	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Slab—Common foundation type in RLA2	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with NFIP and local floodplain management regulations. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow value on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Basement—Foundation type not common in RLA2	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures.

Foundation	Probable Mitigation Measures
	Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
All Foundation Types	Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.2.3 Unincorporated Orange County RLA3 Mitigation

In addition to the single RL property, an additional 47 structures were identified in RLA3 for Unincorporated Orange County. Probable mitigation measures for the structures located in RLA3 apply to both the RL designated property and the non-RL designated properties based on the identified flooding source of the Silverado Canyon flooding extent (a 25-year event). Data suggests that the most common structure for this RL area is a single-family residential structure that is single story with either a slab or crawlspace foundation.

Table 5-6. Unincorporated Orange County RLA3 Mitigation Measures

Foundation	Probable Mitigation Measures
Crawl Space—Common foundation type in RLA3	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Slab—Common foundation type in RLA3	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with NFIP and local floodplain management regulations. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow value on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing

Foundation	Probable Mitigation Measures
	on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Basement—Foundation type not common in RLA3	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
All Foundation Types	Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.2.4 Unincorporated Orange County RLA4 Mitigation

In addition to the single RL property, an additional 136 structures were identified in RLA4 for Unincorporated Orange County. Probable mitigation measures for the structures located in RLA4 apply to both the RL designated property and the non-RL designated properties based on the identified flooding source of hillside canyon flooding. Data suggests that the most common structure for this RL area is a single-family residential structure that is single story with a slab foundation.

Table 5-7. Unincorporated Orange County RLA4 Mitigation Measures

Foundation	Probable Mitigation Measures
Crawl Space—Foundation type not common in RLA4	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Slab—Common foundation type in RLA4	Elevation and drainage improvement.

Foundation	Probable Mitigation Measures
	Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with NFIP and local floodplain management regulations. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow value on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Basement—Foundation type not common in RLA4	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
All Foundation Types	Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.2.5 Unincorporated Orange County RLA5 Mitigation

In addition to the single RL property, an additional 141 structures were identified in RLA5 for Unincorporated Orange County. Probable mitigation measures for the structures located in RLA5 apply to both the RL designated property and the non-RL designated properties based on the identified flooding source of the Silverado Canyon hillside slope flooding. Data suggests that the most common structure for this RL area is a single-family residential structure that is single story with either a slab or crawlspace foundation.

Table 5-8. Unincorporated Orange County RLA5 Mitigation Measures

Foundation	Probable Mitigation Measures
Crawl Space—Common foundation type in RLA5	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of

Foundation	Probable Mitigation Measures
	bringing the structure into compliance with the NFIP and local floodplain management regulations. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Slab—Common foundation type in RLA5	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with NFIP and local floodplain management regulations. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow value on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Basement—Foundation type not common in RLA5	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
All Foundation Types	Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.2.6 Unincorporated Orange County RLA6 Mitigation

In addition to the single RL property, an additional 973 structures were identified in RLA6 for Unincorporated Orange County. Probable mitigation measures for the structures located in RLA6 apply to both the RL designated property and the non-RL designated properties based on the identified flooding source of runoff from adjacent higher ground properties. Data suggests that the most common structure for this RL area is a single-family residential structure that is single story with either a slab or crawlspace foundation.

Table 5-9. Unincorporated Orange County RLA6 Mitigation Measures

Foundation	Probable Mitigation Measures
Crawl Space—Common foundation type in RLA6	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Slab—Common foundation type in RLA6	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with NFIP and local floodplain management regulations. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow value on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Basement—Foundation type not common in RLA6	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in.

Foundation	Probable Mitigation Measures
	Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
All Foundation Types	Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.2.7 City of Newport Beach RLA1 Mitigation

In addition to the single RL property, an additional 1,202 structures were identified in RLA1 for Newport Beach. Probable mitigation measures for the structures located in RLA1 apply to both the RL designated property and the non-RL designated properties based on the identified flooding source of poor local drainage. Data suggests that the most common structure for this RL area is a single-family residential structure that is single story with either a slab or crawlspace foundation.

Table 5-10. Newport Beach RLA1 Mitigation Measures

Foundation	Probable Mitigation Measures
Crawl Space—Common foundation type in RLA1	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Slab—Common foundation type in RLA1	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with NFIP and local floodplain management regulations. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow

Foundation	Probable Mitigation Measures
	value on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Basement—Foundation type not common in RLA1	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
All Foundation Types	Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.2.8 City of Newport Beach RLA2 Mitigation

In addition to the single RL property, an additional 2,088 structures were identified in RLA2 for Newport Beach. Probable mitigation measures for the structures located in RLA2 apply to both the RL designated property and the non-RL designated properties based on the identified flooding source of wave facing coastal flooding, harbor inlet. Data suggests that the most common structure for this RL area is a single-family residential structure that is single story with either a slab or crawlspace foundation.

Table 5-11. Newport Beach RLA2 Mitigation Measures

Foundation	Probable Mitigation Measures
Slab—Common foundation type in RLA2	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with NFIP and local floodplain management regulations. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flood on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow value on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures.

Foundation	Probable Mitigation Measures
	Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Crawl Space—Foundation type not common in RLA2	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Basement—Foundation type not common in RLA2	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
All Foundation Types	Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.2.9 City of Newport Beach RLA3 Mitigation

In addition to the single RL property, an additional 1,371 structures were identified in RLA3 for Newport Beach. Probable mitigation measures for the structures located in RLA3 apply to both the RL designated property and the non-RL designated properties based on the identified flooding source of runoff from adjacent higher ground properties. Data suggests that the most common structure for this RL area is a single-family residential structure that is single story with either a slab or crawlspace foundation.

Table 5-12. Newport Beach RLA3 Mitigation Measures

Foundation	Probable Mitigation Measures
Crawl Space—Common foundation type in RLA3	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure in a coastal floodplain with wave action will require the use of an open foundation and piers, post, piles, or columns. Structures with a slab foundation is the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Slab—Common foundation type in RLA3	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with NFIP and local floodplain management regulations. Elevating a structure in a coastal floodplain with wave action will require the use of an open foundation and piers, post, piles, or columns. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow value on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Basement—Foundation type not common in RLA3	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in. Elevating a structure in a coastal floodplain with wave action will require the use of an open foundation and piers, post, piles, or columns. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow

Foundation	Probable Mitigation Measures
	valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Pile, Post, Column—Foundation type not common in RLA3	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure in a coastal floodplain with wave action will require the use of an open foundation and piers, post, piles, or columns. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
All Foundation Types	Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.2.10 City of Newport Beach RLA4 Mitigation

In addition to the single RL property, an additional 783 structures were identified in RLA4 for Newport Beach. Probable mitigation measures for the structures located in RL4 apply to both the RL designated property and the non-RL designated properties based on the identified flooding source of water accumulation in downstream half of alley and garages are near the street level. Data suggests that the most common structure for this RL area is a single-family residential structure that has two stories with a crawlspace foundation.

Table 5-13. Newport Beach RLA4 Mitigation Measures

Foundation	Probable Mitigation Measures
Crawl Space—Common foundation type in RLA4	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures.

Foundation	Probable Mitigation Measures
	Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Slab— Foundation type not common in RLA4	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Basement— Foundation type not common in RLA4	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
All Foundation Types	Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.2.11 City of Newport Beach RLA5 Mitigation

In addition to the single RL property, an additional 829 structures were identified in RLA5 for Newport Beach. Probable mitigation measures for the structures located in RLA5 apply to both the RL designated property and the non-RL designated properties based on the identified flooding source of poor local drainage and properties lower than street level. Data suggests that the most common structure for this RL area is a single-family residential structure that has two stories with either a slab or crawlspace foundation.

Table 5-14. Newport Beach RLA5 Mitigation Measures

Foundation	Probable Mitigation Measures
Crawl Space—Common foundation type in RLA5	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Slab—Common foundation type in RLA5	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Basement—Foundation type not common in RLA5	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate,

Foundation	Probable Mitigation Measures
All Foundation Types	developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later. Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.2.12 City of Newport Beach RLA6 Mitigation

In addition to the single RL property, an additional 2,074 structures were identified in RLA6 for Newport Beach. Probable mitigation measures for the structures located in RLA6 apply to both the RL designated property and the non-RL designated properties based on the identified flooding source of garages near street level near drains to bay. Data suggests that the most common structure for this RL area is a single-family residential structure that is single story with a crawlspace foundation.

Table 5-15. Newport Beach RLA6 Mitigation Measures

Foundation	Probable Mitigation Measures
Crawl Space—Common foundation type in RLA6	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Slab— Foundation type not common in RLA6	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.

Foundation	Probable Mitigation Measures
Basement—Foundation type not common in RLA6	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Pile, Post, Column—Foundation type not common in RLA6	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
All Foundation Types	Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.2.13 City of Newport Beach RLA7 Mitigation

In addition to the single RL property, an additional 1,962 structures were identified in RLA7 for Newport Beach. Probable mitigation measures for the structures located in RL7 apply to both the RL designated property and the non-RL designated properties based on the identified flooding source of low areas around storm drains. Data suggests that the most common structure for this RL area is a single-family residential structure that has a single story with a crawlspace foundation.

Table 5-16. Newport Beach RLA7 Mitigation Measures

Foundation	Probable Mitigation Measures
Crawl Space—Common foundation type in RLA7	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations.

Foundation	Probable Mitigation Measures
Slab— Foundation type not common in RLA7	Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later. Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters.
Basement— Foundation type not common in RLA7	Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later. Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in.
Pile, post, column— Foundation type not common in RLA7	Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later. Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations.

Foundation	Probable Mitigation Measures
	Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
All Foundation Types	Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.2.14 City of Newport Beach RLA8 Mitigation

In addition to the single RL property, an additional 2,021 structures were identified in RLA8 for Newport Beach. Probable mitigation measures for the structures located in RL8 apply to both the RL designated property and the non-RL designated properties based on the identified flooding source of garages near low lying street drains to the nearby bay. Data suggests that the most common structure for this RL area is a single-family residential structure that is single story with a crawlspace foundation.

Table 5-17. Newport Beach RLA8 Mitigation Measures

Foundation	Probable Mitigation Measures
Crawl Space— Common foundation type in RLA8	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Slab— Foundation type not common in RLA8	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood

Foundation	Probable Mitigation Measures
	resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Basement—Foundation type not common in RLA8	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later..
Pile, post, column—Foundation type not common in RLA8	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
All Foundation Types	Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.2.15 City of San Juan Capistrano RLA1 Mitigation

In addition to the single RL property located in RL Area 1, an additional 1,074 structures were identified in RL Area 1. Probable mitigation measures for the structures located in RL Area 1 apply to both the RL designated property and the non-RL designated properties based on the identified flooding source of hillside slope flooding.

Table 5-18. San Juan Capistrano RLA1 Mitigation Measures

Foundation	Probable Mitigation Measures
Crawl Space—Common foundation type in RL Area 1	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, retaining walls and berms, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Slab—Common foundation type in RL Area 1	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, retaining walls and berms, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Basement—Foundation type not common in RL Area 1	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, retaining walls and berms, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.

Foundation	Probable Mitigation Measures
All Foundation Types	Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.2.16 City of Santa Ana RLA1 Mitigation

In addition to the single RL property, an additional 1,966 structures were identified in RLA1 for Santa Ana. Probable mitigation measures for the structures located in RLA1 apply to both the RL designated property and the non-RL designated properties based on the identified flooding source of poor storm drainage. Data suggests that the most common structure for this RL area is a single-family residential structure that is single story with either a slab or crawlspace foundation.

Table 5-19. Santa Ana RLA1 Mitigation Measures

Foundation	Probable Mitigation Measures
Crawl Space—Common foundation type in RLA1	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Slab—Common foundation type in RLA1	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Basement—Foundation type not common in RLA1	Elevation and drainage improvement.

Foundation	Probable Mitigation Measures
	Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
All Foundation Types	Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.2.17 City of Santa Ana RLA2 Mitigation

In addition to the two RL properties, an additional 1,664 structures were identified in RLA2 for Santa Ana. Probable mitigation measures for the structures located in RLA2 apply to both the RL designated properties and the non-RL designated properties based on the identified flooding source of low elevation where streets drain to adjacent storm channel. Data suggests that the most common structure for this RL area is a single-family residential structure that is single story with a crawlspace foundation.

Table 5-20. Santa Ana RLA2 Mitigation Measures

Foundation	Probable Mitigation Measures
Crawl Space— Common foundation type in RLA2	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Slab— Foundation type not common in RLA2	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management

Foundation	Probable Mitigation Measures
	regulations. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Basement—Foundation type not common in RLA2	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These includes using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
All Foundation Types	Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.2.18 City of Santa Ana RLA3 Mitigation

In addition to the single RL property, an additional 1,986 structures were identified in RLA3 for Santa Ana. Probable mitigation measures for the structures located in RLA3 apply to both the RL designated property and the non-RL designated properties based on the identified flooding source of properties adjacent to flood channel and backwater of channel overtopping. Data suggests that the most common structure for this RL area is a single-family residential structure that is single story with a crawlspace foundation.

Table 5-21. Santa Ana RLA3 Mitigation Measures

Foundation	Probable Mitigation Measures
Crawl Space—Common foundation type in RLA3	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations.

Foundation	Probable Mitigation Measures
	Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Foundation type not common in RLA3	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Basement—Foundation type not common in RLA3	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
All Foundation Types	Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.2.19 City of Santa Ana RLA4 Mitigation

In addition to the single RL property, an additional 1,950 structures were identified in RLA4 for Santa Ana. Probable mitigation measures for the structures located in RLA4 apply to both the RL designated property and the

non-RL designated properties based on the identified flooding source of properties adjacent to flood channel and backwater of channel overtopping. Data suggests that the most common structure for this RL area is a single-family residential structure that is single story with a crawlspace foundation.

Table 5-22. Santa Ana RLA4 Mitigation Measures

Foundation	Probable Mitigation Measures
Crawl Space—Common foundation type in RLA4	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Slab—Foundation type not common in RLA4	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Basement—Foundation type not common in RLA4	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.

Foundation	Probable Mitigation Measures
All Foundation Types	Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.2.20 City of Santa Ana RLA5 Mitigation

In addition to the single RL property, an additional 1,138 structures were identified in RLA5 for Santa Ana. Probable mitigation measures for the structures located in RLA5 apply to both the RL designated property and the non-RL designated properties based on the identified flooding source of flooding from adjacent higher properties and poor property drainage. Data suggests that the most common structure for this RL area is a single-family residential structure that is single story with a crawlspace foundation.

Table 5-23. Santa Ana RLA5 Mitigation Measures

Foundation	Probable Mitigation Measures
Crawl Space—Common foundation type in RLA5	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Slab— Foundation type not common in RLA5	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Basement—Foundation type not common in RLA5	Elevation and drainage improvement.

Foundation	Probable Mitigation Measures
	Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
All Foundation Types	Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.2.21 City of Santa Ana RLA6 Mitigation

In addition to the single RL property, an additional 1,913 structures were identified in RLA6 for Santa Ana. Probable mitigation measures for the structures located in RLA6 apply to both the RL designated property and the non-RL designated properties based on the identified flooding source of local drainage issues. Data suggests that the most common structure for this RL area is a single-family residential structure that is single story with either a crawlspace or slab foundation.

Table 5-24. Santa Ana RLA6 Mitigation Measures

Foundation	Probable Mitigation Measures
Slab—Common foundation type in RLA6	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Structures with a slab foundation are the hardest to elevate and abandoning the lowest floor and installing flood openings is one method to elevate the living floor above the floodwaters. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Crawl Space—Foundation type	Elevation and drainage improvement.

Foundation	Probable Mitigation Measures
not common in RLA6	Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the benefit of bringing the structure into compliance with the NFIP and local floodplain management regulations. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
Basement—Foundation type not common in RLA6	Elevation and drainage improvement. Elevating a structure is considered the most effective retrofitting technique because it raises the lowest floor above the floodwaters. Elevating a structure also provides the bringing the structure into compliance with the NFIP and local floodplain management regulations. Elevating a structure that has a basement will require that the basement be filled in. Some structures may not be able to be elevated due to various reasons. Property owners still have options to reduce the impact of flooding on their property. These include using flood resistant building materials, elevating or floodproofing building utilities, installing a backflow valve on the sewer and drain lines, and many other wet floodproofing and dry floodproofing measures. Improving the drainage on the property helps prevent runoff from pooling around the structure. These measures include improving lot grading to reroute the runoff away from a structure, reducing impervious surfaces of the property to allow water to infiltrate, developing on site detention like rain gardens, and installing rain barrels to collect runoff from roofs that can be released later.
All Foundation Types	Capital Improvement Plan includes a drainage system maintenance and replacement program, stormwater pond improvement program, drainage improvement projects, riverbank restoration, and other stormwater management and floodplain management projects.

5.3 MITIGATION FUNDING SOURCES

This section provides an overview of possible funding sources that communities can use to mitigate repetitive flooding occurrences in Orange County.

5.3.1 Local Mitigation Funding Sources

The SoCal WaterSmart rebate program is a program offered by the Metropolitan Water District of Southern California to allow residents located within the jurisdiction of the District to apply for a rebate for measures that conserve water (SoCal WaterSmart n.d.-a). The District is an organization with 26 member agencies whose mission is to provide its service area with adequate and reliable supply of high-quality water to meet the present and future needs in an environmentally and economically responsible way (Metropololitan Water District of Southern California n.d.-b). The 26 member agencies of the District include the water agencies for the unincorporated Orange County and the cities in Orange County (Metropolotain Water District of Southern California n.d.-a).

While the goal of the rebate program is to improve water conservation, some of the measures that qualify for a rebate can also help address localized flooding on a property. The District provides a rebate for property owners that install rain barrels or cisterns that collect rainwater from roofs that can be used to water lawns (SoCal WaterSmart n.d.-b). The rebate program uses the size of the rain barrel or cistern to calculate the rebate amount (SoCal WaterSmart n.d.-b). For example, a rain barrel with a volume of 50 to 199 gallons will have a rebate amount of $35.00 with a maximum of two rain barrels, a cistern with a volume of 200 to 500 gallons will have a rebate amount of $250.00, a cistern with a volume of 501 to 999 gallons will have a rebate amount of $300.00, and a cistern with a volume 1,000 or greater will have a rebate amount of $350.00 (SoCal WaterSmart n.d.-b). The rebate program has specific guidelines for property owners to follow in order to receive the rebate. For example, property owners cannot submit a claim for both a rain barrel and a cistern (SoCal WaterSmart n.d.-b). In addition to being a great way to conserve water, rain barrels and cisterns capture rainfall that would otherwise become runoff or pool around the foundation of a structure (Reduce Flood Risk n.d.-b).

Figure 5-18. Rain Barrels



Source: (City of Los Angeles Sanitation n.d.)

In addition to the rebate for installing rain barrels and cisterns, the District also provides a rebate for turf replacement (SoCal WaterSmart n.d.-c). The aims of the turf replacement program are to have property owners to remove their existing grass and replace it with drought tolerant landscaping and to combine turf removal, irrigation modification, and rainwater retention or filtration to support the reuse or soil absorption of rainwater (SoCal WaterSmart n.d.-c). Each turf replacement project must include three new plants per 100 square feet of area transformed, a stormwater retention feature, no hardscape within the transformed area except for permeable hardscape, replacement or modification of overhead spray sprinklers, and an optional rebate for tree installation (SoCal WaterSmart n.d.-c). The stormwater retention feature can include rain gardens, vegetated swales, dry riverbeds (rock-lined swale), berms, and rain barrels and cisterns (SoCal WaterSmart n.d.-d). A rain garden is a low lying area in the landscape planted with wetland or wet-tolerant plants that collects the runoff from impervious surfaces that would otherwise flow into stormwater systems (Reduce Flood Risk n.d.-c). The collected runoff would then be absorbed by the plants or infiltrate into the ground (Reduce Flood Risk n.d.-c). Improving lot grading and constructing swales and berms help protect structures from flooding via runoff by redirecting the water away from the structure to other areas like rain gardens, detention basins, and other stormwater features (Reduce Flood Risk n.d.-a). Finally, reducing impervious surfaces by installing permeable surfaces or natural greenspace will allow for greater infiltration and lead to less runoff (EPA 2025) (FEMA n.d.-b).

Figure 5-19. Vegetated Swale



Source: (SoCal WaterSmart n.d.-d)

5.3.2 State Mitigation Funding Sources

In addition to the local rebate programs, the state offers different loans and grants that address flooding. The California Department of Water Resources (Cal DWR) is the state agency whose mission is to sustainably manage the water resources of California to benefit the state's people and protect, restore, and enhance the natural and human environments (Cal DWR n.d.-a). Cal DWR's Flood Management Division handles the floodplain management for the state and also has several grants that communities can apply for to address their flooding issues (Cal DWR n.d.-e). Several of the available grants are only available to communities located in certain parts of California like the Central Valley or the Sacramento San Joaquin delta; however, there are other grants available to communities located outside of these areas.

The Coastal Watershed Flood Risk Reduction Program is a grant that will fund projects in coastal areas that focus on multi-benefit flood risk reduction projects (Cal DWR n.d.-b). The projects that are funded will address flood risk and public safety, enhance coastal ecosystems including enhancing fish and wildlife habitat, and promoting natural resources stewardship and public access corridors (Cal DWR n.d.-b). The projects can be either structural or non-structural; for example, the project can be relocating or floodproofing flood-prone structures or restoring the natural hydrological or biological processes of rivers and wetlands (Cal DWR n.d.-b). Projects must be in areas that intersect the California coast and priority will be given to projects that are located in FEMA's Coastal VE, AE, and A Zones and FEMA SFHA (Cal DWR n.d.-b).

The Flood Corridor Program provides grant funding for nonstructural flood management projects that include wildlife habitat enhancement or agricultural land preservation (Cal DWR n.d.-c). The benefits of restoring natural

or agricultural land and floodplain functions are that the floodwaters can safely disperse over the floodplain and reduce peak flows (Cal DWR n.d.-c). The Flood Emergency Response Projects is a program that provides grants to public agencies in California whose primary responsibility is flood emergency response and coordination, and its goal is to improve the flood emergency response and contribute to increased public safety (Cal DWR n.d.-d). The Flood Emergency Response Projects has three grant programs which are the Statewide Grants, the Delta Grants, and the Delta Emergency Community Equipment Grants (Cal DWR n.d.-d). The Statewide Grants are available to communities outside of the legal delta in California while the Delta Grants are for communities located in the legal delta, which is the Sacramento-San Joaquin delta (Cal DWR n.d.-d). The legal delta for California is the Sacramento – San Joaquin delta as outline in the California Water Code (California Legislature 1959). The Floodplain Management, Protection, and Risk Awareness Grant program provides local agencies with financial assistance for risk reduction activities related to stormwater flooding, mudslides, and flash floods (Cal DWR n.d.-f).

5.3.3 Federal Mitigation Funding Sources

There are many federal grant programs that support flood mitigation projects. FEMA offers grants that provide 75% of the cost of the project, with 25% required to be covered by state, local, or private entities. Each program has different requirements and rules about the types of projects that can be supported. Table 5-25 identifies three of the primary federal funding sources for property scale flood mitigation projects.

Table 5-25. Federal Funding Sources for Flood Mitigation Projects

Types of Projects	HMGP	FMA	ICC
Acquisition	X	X	
Relocation	X	X	X
Demolition	X	X	X
Elevation	X	X	X
Replacement	X	X	X
Drainage Improvements	X	X	
Dry Floodproofing	X	X	
Federal Share	*75%*	*Up to 100%*	*Up to $30,000*

The Hazard Mitigation Grant Program (HMGP) provides funding to state and local governments to implement long-term hazard mitigation measures to reduce flood risk (FEMA 2025c). Examples of eligible HMGP projects include acquisition and elevation of floodprone buildings.

Increased Cost of Compliance (ICC) coverage is available for elevation, relocation, demolition, and floodproofing of properties that have been repetitively damaged (FEMA 2023). The community must have RL provisions in their flood damage prevention ordinance, the structure must have been damaged two times in the past 10 years, the cost of repairs equal or exceed 25% of the market value at the time of damage, and at least two flood insurance claims have been paid for the losses. ICC coverage can provide up to $30,000 to help meet the costs of bringing the structure into compliance with local community's requirements and regulations.

The Flood Mitigation Assistance (FMA) grant program funds assist States and communities in implementing measures that reduce or eliminate the long-term risk of flood damage to structures insured under the NFIP, such as elevation, acquisition, or relocation of NFIP-insured structures (FEMA 2025d). States are encouraged to prioritize FMA funds for applications that include repetitive loss properties.

5.4 FLOOD DAMAGE PREVENTION ORDINANCE AND BUILDING CODES

This section covers how building codes and flood damage prevention ordinance can be used to reduce the risk of flooding and reduce flood damage.

The NFIP establishes minimum standards that all participating communities must adopt and enforce (FEMA 2024b). The NFIP floodplain standards are listed under 44 CFR 60.3 and are based on if FEMA has provided flood hazard data and flood elevation data for the community (FEMA 2020). The minimum standards include having a permit for any development located in the FEMA identified floodplain, using flood resistant building materials, being designed and anchored to resist floatation, collapse, or lateral movement, having the lowest floor elevated to or above the base flood elevation, limiting enclosed areas below the lowest floor to only parking, storage, and building access, using openings in enclosed areas that automatically open to provide entry and exit for floodwaters, and designing water supply and wastewater systems to minimize or eliminate the infiltration of flood waters (Code of Federal Regulations 1976). Participating communities can adopt higher standards than the NFIP minimum to further reduce the risk of flooding within their community (FEMA 2024b). These higher standards could include having a higher freeboard for new development, limiting the size of enclosures below the lowest floor of a structure, and limiting the use of fill to elevate structures above the base flood (Cal DWR n.d.-g). California has a standard higher than the NFIP minimum with the California Building Standard Codes requiring all new structures in the floodplain to be elevated at least 1 foot above the base flood elevation (Cal DWR 2020). The purpose of having a floodplain management or flood damage prevention ordinance is to reduce the flood risk and damage of new development in the floodplain.

The International Codes (I-Codes) are a family of modern building safety codes developed and maintained by the International Code Council that help insure the design and construction of safe, sustainable, and affordable structures (ICC 2019) (ICC 2024). The I-Codes share the goals of the NFIP of protecting public safety and reduced property damage and the codes since the 2012 edition have either met or exceeded the NFIP requirements (ICC 2019). There are several advantages to use or integrate the I-Codes into a community's ordnance. First, there would be fewer conflicts because the building codes and the floodplain management ordinances would be coordinated to remove conflicts and duplication of ordinance and a community would not have to worry about conflicts that would arise when separate building codes or floodplain management ordinance are updated without the other being updated as well (ICC 2019). Second, the I-Codes address multiple hazards in the construction requirements and a community that adopts the I-Code as their building codes and floodplain management ordinance will have the benefit of any new development being built to resist not only the flooding in a community but also any hazard within their community boundary (ICC 2019). Third, the I-Codes meet or exceed NFIP standards and are modified to incorporate industry standards (ICC 2019). This makes any new development meet or exceed the required NFIP standards and be designed and built in a way to resist flood damage. Fourth, adopting the I-Codes strengthens the procedures of issuing permits for development in the floodplain, strengthens the enforcement of building codes, floodplain management ordinances and inspections development, and improves compliance with the codes and ordinances (ICC 2019). Adopting building codes that meet or exceed the NFIP minimum standards ensures that any new development within a community is designed and built in a way that reduces the new structure's risk to flooding and mitigates against future flood damage.

6. UPDATE TO RL INVENTORY

A review of the RL List for Unincorporated Orange County identified 10 properties that are not located within the Unincorporated County. These properties are within the jurisdiction of other NFIP communities that are not included in this RLAA. Of the 10 properties, 3 have been determined to not meet the NFIP RL thresholds. These 10 properties have been removed from the RL List and an RL Update Worksheet for transmittal to FEMA showing these changes to the RL List for Unincorporated Orange County has been drafted. The 10 properties are shown in Table 6-1, identified by their FEMA RL Number ID, and the correct jurisdiction where they are located is identified.

Table 6-1. RL Properties in NFIP Communities Not Included in this RLAA

FEMA RL Number ID	Correct NFIP Community	Community Identification Number (CID)	NFIP Repetitive Loss Flag
834	City of Laguna Niguel	060764	YES
17947	City of Dana Point	060736	YES
54072	City of Laguna Beach	060223	YES
55404	City of Laguna Niguel	060764	YES
80661	City of Laguna Niguel	060764	YES
94592	City of Laguna Beach	060223	YES
287756	City of Huntington Beach	065034	YES
93548	City of Dana Point	060736	NO
128702	City of Dana Point	060736	NO
295270	City of Laguna Beach	060223	NO

Additionally, one RL property identified as within the City of Santa Ana has been determined to be within Unincorporated Orange County and is shown in Table 6-2. This property has been included under Unincorporated Orange County for the purposes of this RLAA.

Table 6-2. RL Property in Unincorporated County Previously Identified as in Santa Ana

FEMA RL Number ID	Correct NFIP Community	Community Identification Number (CID)
95573	Unincorporated Orange County	060212

7. MAINTENANCE AND EVALUATION

CRS participating communities within the RLAA will continue to meet annual CRS requirements for RL properties. This includes submitting an RLAA annual progress report with CRS annual certification documentation. An RLAA annual progress report template can be found in Appendix G. Communities are encouraged to maintain their FEMA Information Sharing Access Agreement to obtain RL data on an annual basis. Annual CRS RL area letter requirements will be maintained by each CRS community. Additionally, the CRS communities will continue to monitor RL areas for flooding issues, provide technical assistance, and disseminate information on mitigation opportunities to property owners.

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APPENDIX A: CRS ACTIVITY 370 FLOOD INSURANCE ASSESSMENT

RLAA participating communities may elect to utilize the CRS Activity 370 Flood Insurance Assessment (FIA) completed in the RLAA report. CRS credit criteria for FIA, Step 4, requires the FIA to be shared with the community's governing body. For reporting purposes, the adoption of the RLAA by governing body is also considered to meet Step 4.

(4) Submit to the governing body. The assessment document (containing only general or aggregated data or maps) is submitted to the community's governing body. In the case of a multi-jurisdictional plan, each community seeking this credit must submit the document to its governing body. No action needs to be taken by the governing body for FIA credit.

APPENDIX B: STEP 1: RLAA OUTREACH

PROPERTY OWNER LETTERS

Unincorporated Orange County

OC Public Works

September 22, 2025

Scan QR code to access questionnaire

[Property Address]

Subject: Orange County Repetitive Loss Area Analysis

Dear Property Owner,

As part of Orange County's participation in the National Flood Insurance Program (NFIP) Community Rating System (CRS), the County is evaluating properties that have experienced repetitive flood damage to develop an Orange County repetitive loss area analysis that includes unincorporated portions of the County and the following participating jurisdictions: City of San Juan Capistrano, City of Santa Ana, and the City of Newport Beach. This analysis will include a review of all previous flood data and studies conducted in these locations. The purpose of this analysis is to provide a plan to identify flood vulnerabilities and develop strategies to help minimize losses to structures which pose a risk for repeated flood damage. These include documented FEMA Repetitive Loss (RL) structures as well as those identified to have similar potential for damages.

This repetitive loss area analysis will support potential reductions of your and your neighbors' flood insurance premiums for eligible NFIP-insured properties under the CRS program. The Federal Emergency Management Agency (FEMA) defines a repetitive loss property as any insurable building for which two or more claims of more than $1,000 were paid by the NFIP, over any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP. Based on this, there are one or more repetitive loss structures in your area.

Property owners are encouraged to provide any relevant flooding information to enable a better understanding of flood risk to the structures. After data collection, Orange County, through its contractor, Tetra Tech Inc., will perform a desktop analysis of each property and may visit properties to survey the flood risk and to take photographs. The County's contractor will be looking at the type and condition of the structure's foundation, drainage patterns on the lot, and whether or not outside mechanical equipment is elevated. This information is required to conduct the analysis, and any identified flood insurance data about private property (i.e., whether it is covered by flood insurance, whether it has received flood insurance claims, etc.) and any data specific to your property that is not already publicly available, will not be released to the public and will be marked for internal use only and protected by the Privacy Act of 1974.

The results of the repetitive loss area analysis will include a review of alternative approaches for property protection measures or drainage improvements where feasible. Once the analysis is complete, a copy of the report can be obtained from OC Public Works or by calling 714-647-3972. Orange County hosted three public open houses August 25-26th seeking citizen engagement. You contribute to this analysis by completing the online questionnaire available on the Orange County Floodplain Management Plan StoryMap at https://ocip.ocpublicworks.com/fmp, or by scanning the QR code above. If you have any questions, please call me at 714-647-3972. The draft report will be posted at (https://ocip.ocpublicworks.com/fmp) for review and comment. Data collected may be referenced by a participating community in their annual RLAA progress report.

Sincerely,

Tho Tran, P.E., Senior Civil Engineer, Floodplain Management & Hydrology

cc: James Tyler, P.E., Manager, OC Infrastructure Programs/Flood Programs

601 North Ross Street, Santa Ana, CA 92701
P.O. Box 4048, Santa Ana, CA 92702-4048

www.OCPublicWorks.com
(714) 667-8800 | info@OCPW.ocgov.com

City of Newport Beach

09/29/2025
Property Address: [ADDRESS]
Re: Orange County Repetitive Loss Area Analysis

Dear Property Owner,

As part of Orange County's participation in the National Flood Insurance Program (NFIP) Community Rating System (CRS), the County is evaluating properties that have experienced repetitive flood damage to develop an Orange County repetitive loss area analysis that includes unincorporated portions of the County and the following participating jurisdictions: City of San Juan Capistrano, City of Santa Ana, and the City of Newport Beach. This analysis will include a review of all previous flood data and studies conducted in these locations. The purpose of this analysis is to provide a plan to identify flood vulnerabilities and develop strategies to help minimize losses to structures which pose a risk for repeated flood damage. These include documented FEMA Repetitive Loss (RL) structures as well as those identified to have similar potential for damages.

Scan QR code to access questionnaire

This repetitive loss area analysis will support potential reductions of yours and your neighbors' flood insurance premiums for eligible NFIP-insured properties under the CRS program. The Federal Emergency Management Agency (FEMA), a repetitive loss property is any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP), with any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP. Based on this, there are one or more repetitive loss structures in your area.

Property owners are encouraged to provide any relevant flooding information to enable a better understanding of flood risk to the structures. After data collection, Orange County, through its contractor, Tetra Tech Inc., will perform a desktop analysis of each property and may visit properties to survey the flood risk and to take photographs. The County's contractor will be looking at the type and condition of the structure's foundation, drainage patterns on the lot, and whether or not outside mechanical equipment is elevated. This information is required to conduct the analysis and any identified flood insurance data about private property (i.e., whether it is covered by flood insurance, whether it has received flood insurance claims, etc.) and any data specific to your property this is not already publicly available will not be released to the public and will be marked for internal use only and protected by the Privacy Act of 1974.

The results of the repetitive loss area analysis will include a review of alternative approaches for property protection measures or drainage improvements where feasible. Once the analysis is complete, a copy to the report can be obtained from the Orange County Office of Public Works or by calling 949-644-3200. Orange County hosted three public open houses August 25-26th seeking citizen engagement. You contribute to this analysis by completing the online questionnaire available on the Orange County Floodplain Management Plan StoryMap at https://ocip.ocpublicworks.com/fmp, or by scanning the QR code above. If you have any questions, please contact me at mkubischta@newportbeachca.gov. The draft report will be posted at https://ocip.ocpublicworks.com/fmp for review and comment. Data collected may be referenced by a participating community in their annual RLAA progress report.

Sincerely,
Melissa Kubischta, SE
Principal Engineer-Plan Check
Floodplain Manager
Community Development
Office: 949-644-3278

100 Civic Center Drive
Newport Beach, CA 92660

City of Santa Ana

(DATE)
Property Address: (ADDRESS)
Re: Orange County Repetitive Loss Area Analysis

Dear Property Owner,

As part of Orange County's participation in the National Flood Insurance Program (NFIP) Community Rating System (CRS), the County is evaluating properties that have experienced repetitive flood damage to develop an Orange County repetitive loss area analysis that includes unincorporated portions of the County and the following participating jurisdictions: City of San Juan Capistrano, City of Santa Ana, and the City of Newport Beach. This analysis will include a review of all previous flood data and studies conducted in these locations. The purpose of this analysis is to provide a plan to identify flood vulnerabilities and develop strategies to help minimize losses to structures which pose a risk for repeated flood damage. These include documented FEMA Repetitive Loss (RL) structures as well as those identified to have similar potential for damages.

Scan QR code to access questionnaire

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Property owners are encouraged to provide any relevant flooding information to enable a better understanding of flood risk to the structures. After data collection, Orange County, through its contractor, Tetra Tech Inc., will perform a desktop analysis of each property and may visit properties to survey the flood risk and to take photographs. The County's contractor will be looking at the type and condition of the structure's foundation, drainage patterns on the lot, and whether or not outside mechanical equipment is elevated. This information is required to conduct the analysis and any identified flood insurance data about private property (i.e., whether it is covered by flood insurance, whether it has received flood insurance claims, etc.) and any data specific to your property this is not already publicly available will not be released to the public and will be marked for internal use only and protected by the Privacy Act of 1974.

The results of the repetitive loss area analysis will include a review of alternative approaches for property protection measures or drainage improvements where feasible. Once the analysis is complete, a copy to the report can be obtained from the Orange County Office of Public Works or by calling (NUMBER). Orange County hosted three public open houses August 25-26th seeking citizen engagement. You contribute to this analysis by completing the online questionnaire available on the Orange County Floodplain Management Plan StoryMap at (https://ocip.ocpublicworks.com/fmp), or by scanning the QR code above. If you have any questions, please call me at (NUMBER). The draft report will be posted at (https://ocip.ocpublicworks.com/fmp) for review and comment. Data collected may be referenced by a participating community in their annual RLAA progress report.

Sincerely,
(SIGNATURE BOX)

(NAME), (TITLE)
Orange County Office of Public Works

City of San Juan Capistrano

32400 PASEO ADELANTO
SAN JUAN CAPISTRANO, CA 92675
(949) 493-1171
(949) 493-1053 FAX
www.sanjuancapistrano.org

MEMBERS OF THE CITY COUNCIL

TROY BOURNE
JOHN CAMPBELL
SERGIO FARIAS
HOWARD HART
JOHN TAYLOR

September 22, 2025
Property Address: [ADDRESS]
Orange County Repetitive Loss Area Analysis

Dear Property Owner,

As part of Orange County's participation in the National Flood Insurance Program (NFIP) Community Rating System (CRS), the County is evaluating properties that have experienced repetitive flood damage to develop an Orange County repetitive loss area analysis that includes unincorporated portions of the County and the following participating jurisdictions: City of San Juan Capistrano, City of Santa Ana, and the City of Newport Beach. This analysis will include a review of all previous flood data and studies conducted in these locations. The purpose of this analysis is to provide a plan to identify flood vulnerabilities and develop strategies to help minimize losses to structures which pose a risk for repeated flood damage. These include documented FEMA Repetitive Loss (RL) structures as well as those identified to have similar potential for damages.

Scan QR code to access questionnaire

This repetitive loss area analysis will support potential reductions of yours and your neighbors' flood insurance premiums for eligible NFIP-insured properties under the CRS program. The Federal Emergency Management Agency (FEMA), a repetitive loss property is any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP), with any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP. Based on this, there are one or more repetitive loss structures in your area.

Property owners are encouraged to provide any relevant flooding information to enable a better understanding of flood risk to the structures. After data collection, Orange County, through its contractor, Tetra Tech Inc., will perform a desktop analysis of each property and may visit properties to survey the flood risk and to take photographs. The County's contractor will be looking at the type and condition of the structure's foundation, drainage patterns on the lot, and whether or not outside mechanical equipment is elevated. This information is required to conduct the analysis and any identified flood insurance data about private property (i.e., whether it is covered by flood insurance, whether it has received flood insurance claims, etc.) and any data specific to your property this is not already publicly available will not be released to the public and will be marked for internal use only and protected by the Privacy Act of 1974.

The results of the repetitive loss area analysis will include a review of alternative approaches for property protection measures or drainage improvements where feasible. Once the analysis is complete, a copy to the report can be obtained from the Orange County Office of Public Works or by calling (949) 443-6353. Orange County hosted three public open houses August 25-26th seeking citizen engagement. You contribute to this analysis by completing the online questionnaire available on the Orange County Floodplain Management Plan StoryMap at (https://ocip.ocpublicworks.com/fmp), or by scanning the QR code above. If you have any questions, please call (949) 443-6353. The draft report will be posted at (https://ocip.ocpublicworks.com/fmp) for review and comment. Data collected may be referenced by a participating community in their annual RLAA progress report.

Sincerely,

Shawn Mousavi

Shawn Mousavi
Senior Civil Engineer
Engineering & Environmental Services

RLAA PUBLIC MEETINGS

Date	Location	Meeting
8/25/2025 at 10 a.m. - 1 p.m. PST	County Administration South (CAS) Multipurpose Room, 601 North Ross Street, Santa Ana, CA 92701	Open House 1: This will be an open house style meeting for the public to learn more about the 2026 Orange County Floodplain Management Plan and Repetitive Loss Area Analysis.
8/25/2025 at 4 p.m. - 6 p.m. PST	County Administration South (CAS) Multipurpose Room, 601 North Ross Street, Santa Ana, CA 92701	Open House 2: This will be an open house style meeting for the public to learn more about the 2026 Orange County Floodplain Management Plan and Repetitive Loss Area Analysis.
8/26/2025 at 10 a.m. - 1 p.m. PST	Newport Beach Civic Center, First Floor, Bay E, Corona del Mar Conference Room 100 Civic Center Drive, Newport Beach, CA 92660	Open House 3: This will be an open house style meeting for the public to learn more about the 2026 Orange County Floodplain Management Plan and Repetitive Loss Area Analysis.
10/9/2025 at 9:30 -10:30 a.m. PST	Virtual meeting via Microsoft Teams Join the meeting at the date and time by clicking the link here. *Don't have Microsoft Teams?* Dial in by phone +1 213-357-2812,,260765096# Phone conference ID: 260 765 096#	Draft Floodplain Management Plan (FMP) & Repetitive Loss Area Analysis (RLAA) Review Meeting: The draft FMP and RLAA will be presented to the public and stakeholders. A draft review period will commence to allow feedback on the draft FMP.


OC Public Works
Orange County Floodplain Management Plan & Repetitive Loss Area Analysis
Open House!
Review the draft plan, learn about flood hazards in your area, and provide feedback on future mitigation efforts.
All are welcome!
JOIN US AT ONE OF OUR OPEN HOUSE MEETINGS!
8/25
County Administration South
1st Floor, Multipurpose Room
Monday, August 25th
10am - 1pm or 4pm - 6pm
8/26
Newport Beach Civic Center
1st Floor, Bay E
Tuesday, August 26th
10am - 1pm
ocip.ocpublicworks.com/fmp

REPETITIVE LOSS AREA ANALYSIS (RLAA) QUESTIONNAIRE

In parallel efforts, Orange County is developing a Repetitive Loss Area Analysis (RLAA) report to supplement floodplain management efforts. The purpose of the RLAA report is to identify the cases of flood loss in the community and define actions that can be taken to reduce those losses.

Want to be a part of the RLAA? Take the RLAA Questionnaire today! Your input will be included in the RLAA report for the County.

The draft plan will be made available for review and comment. Survey data received will remain anonymous and will be referenced with the County's annual progress report. Reference the calendar of meetings listed above to join us for an OC FMP/RLAA Open House where you can meet with us and discuss the projects and share information on your experiences as a property owner.

Orange County Repetitive Loss Area Analysis Questionnaire

Orange County is in the process of completing a Repetitive Loss Area Analysis in order to identify the cases of flood loss in the community and define actions that can be taken to reduce those losses.

We welcome your input on the flooding hazard and your flood experience related to your property and neighboring areas. Survey collection will be closed on **10/1/2025.**

This survey is specific to the community's experience of flooding events in the area.

If you have any questions, please contact Melissa Mitchell at Melissa.Mitchell@tetratech.com.

When you submit this form, it will not automatically collect your details like name and email address unless you provide it yourself.

1. When did you move into this home or building?

Please input date (M/d/yyyy)

2. Has this structure ever been flooded or has it had water in the crawlspace/basement?

- ◯ Yes
- ◯ No
- ◯ Unknown

3. What was the longest time that water stayed in the structure?

- ◯ Less than 4 hours
- ◯ Between 4 and 12 hours
- ◯ Between 12 and 24 hours
- ◯ Greater than 24 hours
- ◯ Unknown

4. During flooding events that impact your neighborhood, what type of flooding do you notice? Check all that affect your structure.

- ☐ Storm sewer backup
- ☐ Standing water next to the structure or on street
- ☐ Drainage from nearby properties
- ☐ Groundwater/basement leaks
- ☐ River overflow
- ☐ None of the above

5. Have you installed any flood protection on your property? Check all that apply.

- ☐ Sump pump
- ☐ Waterproofed outside walls
- ☐ Re-graded yard
- ☐ Elevated structure
- ☐ Elevated utilities only

- [ ] Deploy sandbags before flooding event
- [ ] Backup generator
- [ ] French drains in basement
- [ ] None of the above

6. Did any of the measures you identified in the question above protect your structure from flood damage?

- ◯ Yes
- ◯ No

7. If **yes**, please use the comment section below to explain which mitigation measures worked in relieving flood risk.
If **no**, please share which mitigation measure was not successful in relieving flood risk in the comment section.

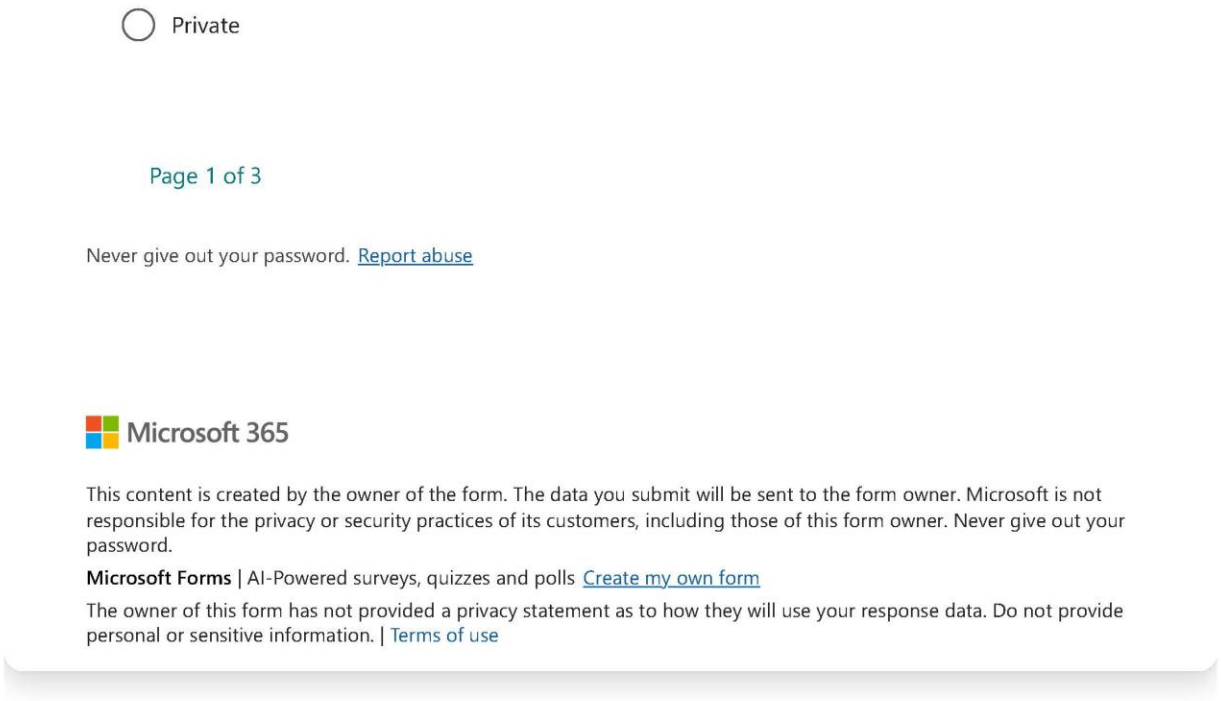
Enter your answer

8. Do you have flood insurance?

- ◯ Yes
- ◯ No

9. If you have flood insurance, what kind?

- ◯ NFIP/federally backed


Private
Page 1 of 3
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Orange County Repetitive Loss Area Analysis Questionnaire

May we contact you with follow up questions or with information on protecting your structure from future flood events? Please provide contact information.

10. Name:

Enter your answer

11. Email Address:

Enter your answer

12. Phone Number:

Enter your answer

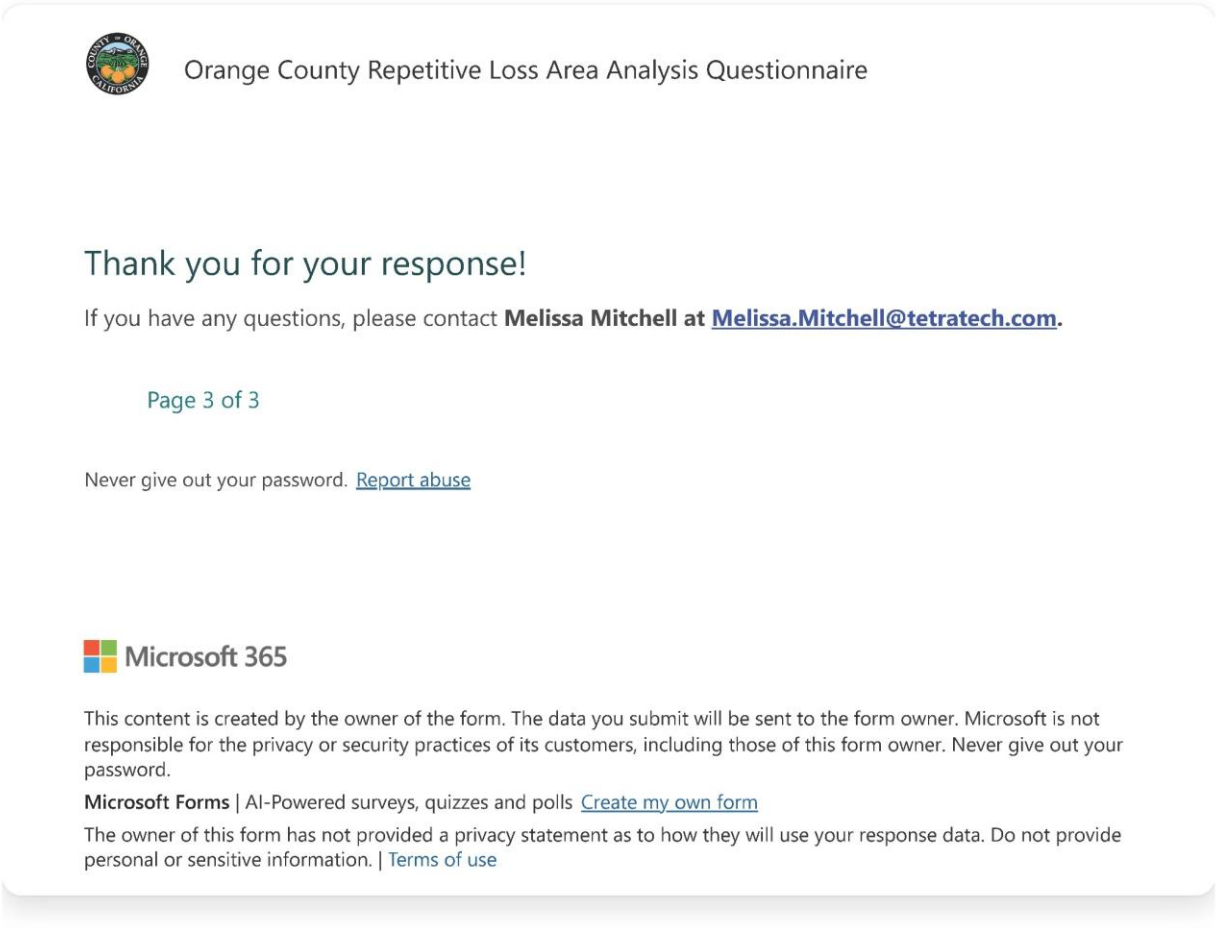
Page 2 of 3

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Orange County Repetitive Loss Area Analysis Questionnaire

Thank you for your response!

If you have any questions, please contact **Melissa Mitchell at Melissa.Mitchell@tetratech.com.**

Page 3 of 3

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APPENDIX C: STEP 2 AGENCY CONTACT OUTREACH

A RLAA questionnaire was distributed to outside agencies per CRS Activity 512.b Step 2 requirements. The following email was sent to each agency on September 9, 2025:

> Orange County is in the process of developing a FEMA Community Rating System (CRS) Repetitive Loss Area Analysis (RLAA). This analysis takes a deeper look into potential sources of repetitive flooding that has impacted insurable structures over the years and qualifying mitigation actions that align with land use, property owner actions, and/or larger mitigation actions such as structural elevation or acquisition. Under the process, we are seeking to collect data in support of:
>
> *Agencies or organizations that may have plans or studies that could affect the cause or impacts of the flooding. The agencies or organizations must be identified in the analysis report.*
>
> Your agency has been identified as a potential resource for recent plans or studies that could affect the cause or impacts of flooding sources. Please share by hyperlink, email, or FTP file share sites plans for reference in the Repetitive Loss Area Analysis. If you are a property owner within the County and would like to participate in a citizen focused survey, please visit (https://storymaps.arcgis.com/stories/9cb5a60b07ad4ffb843177a8e4cdaee2) or reference the QR code for the Storymap with additional information about Orange County's 2025 Floodplain Management Plan.
>
> Please contact me with any questions that you may have or to request the FTP file share link. This process of the data collection phase will conclude Friday, September 19th for the referenced plans and/or studies collection phase.

No responses were received from any of the contacted agencies. The following agencies were contacted:

- California Data Exchange Center
- California Department of Conservation
- California Department of Water Resources
- California Office of Emergency Services
- California Silver Jackets
- California Water Science Center
- National Oceanic and Atmospheric Administration (NOAA)
- National Weather Service – San Diego Office
- Santa Ana Watershed Project Authority
- Southern California Wetlands Recovery Project
- USGS California Water Science Center

APPENDIX D: RLAA PUBLIC MEETING SIGN IN SHEETS

8/25/2025 AND 8/26/2025 PUBLIC OPEN HOUSES

County of Orange
Floodplain Management Plan & Repetitive Loss Area Analysis
Public Open House
Monday, August 25th 10:00 AM- 1:00PM

Attendee Name	Organization (if any)	Phone Number	Email	Signature

County of Orange
Floodplain Management Plan & Repetitive Loss Area Analysis
Public Open House
Monday, August 25th 4:00 PM- 6:00PM

Attendee Name	Organization (if any)	Phone Number	Email	Signature
Steve Parker	Irvine Resident	(714)512-9274	steve.parker2121@yahoo.com	Steve Parker

County of Orange
Floodplain Management Plan & Repetitive Loss Area Analysis
Public Open House
Tuesday, August 26th 10:00 AM- 1:00PM

Attendee Name	Organization (if any)	Phone Number	Email	Signature
James Tyler		(714) 276-4342	james-j-tyler@yahoo.com	
Melissa Kubischta	City of NB	(949) 644-3278	mkubischta@newportbeachca.gov	
Steve Parker	Irvine Resident	(714) 392-9274	steve.parker2121@yahoo.com	

10/9/2025 VIRTUAL MEETING

Orange County, CA – FMP
Public Draft Review | Minutes

Purpose of Meeting:	Public Draft Plan Review
Location of Meeting:	**Virtual via Microsoft Teams**
Date of Meeting:	October 9, 2025 at 9:30 a.m. – 10:30 a.m. PST

Attendees:

- Tom Ryan, Q3 Consulting, Lake Forest
- John McCarthy, Q3 Consulting, Lake Forest
- Melissa Kubischta, Newport Beach
- Salomon Miranda, CA DWR
- Jeff McIver, Yorba Linda
- Matt Lewis, Community Member, Irvine
- Vu Tran, Irvine
- Regina Hu, Yorba Linda
- Ryan Chapman, Brea
- Christian Vorela, Brea
- Giatho Tran, OC Public Works
- Steve Parker, Project Manager, Tetra Tech
- Joyce Drysdale, OC Public Works
- Grace Altenburg, CRS Planner, Tetra Tech
- Melissa Mitchell, CRS Specialist, Tetra Tech
- Kevin Gambrill, CRS Planner, Tetra Tech
- Harry Katz, CRS Planner, Tetra Tech
- Anita Machiavello, CRS Planner, Tetra Tech
- Eva Marie Martin, PhD Student UC-Irvine
- Matt Jenkins, Fountain Valley

APPENDIX E: NFIP RL UPDATE WORKSHEET TRANSMITTAL SHEETS

TRANSMITTAL SHEET
NFIP REPETITIVE LOSS (RL) UPDATE WORKSHEET

Please provide the following contact information should your community need to be contacted for more information to approve your updates.

Name: _____

Address: _____

_____

Phone: _____ FAX: _____

E-Mail: _____

Please indicate the number of RL Update Worksheets submitted for this update. _____

Signature: _____

A review of the RL List for Unincorporated Orange County identified 10 properties that are not located within the Unincorporated County. Of the 10 properties, 3 have been determined to not meet the NFIP RL thresholds.

FEMA RL Number ID	Correct NFIP Community	Community Identification Number (CID)	NFIP Repetitive Loss Flag
834	City of Laguna Niguel	060764	YES
17947	City of Dana Point	060736	YES
54072	City of Laguna Beach	060223	YES
55404	City of Laguna Niguel	060764	YES
80661	City of Laguna Niguel	060764	YES
94592	City of Laguna Beach	060223	YES
287756	City of Huntington Beach	065034	YES
93548	City of Dana Point	060736	NO
128702	City of Laguna Beach	060223	NO
295270	City of Laguna Beach	060223	NO

FEMA

NATIONAL FLOOD INSURANCE PROGRAM®

TRANSMITTAL SHEET
NFIP REPETITIVE LOSS (RL) UPDATE WORKSHEET

Please provide the following contact information should your community need to be contacted for more information to approve your updates.

Name: _____

Address: _____

_____

Phone: _____ FAX: _____

E-Mail: _____

Please indicate the number of RL Update Worksheets submitted for this update. _____

Signature: _____

One RL property identified as within the City of Santa Ana has been determined to be within Unincorporated Orange County.

FEMA RL Number ID	Correct NFIP Community	Community Identification Number (CID)
95573	Unincorporated Orange County	060212

FEMA

NATIONAL FLOOD INSURANCE PROGRAM®

APPENDIX F: DRAFT ADOPTION RESOLUTION

RESOLUTION OF THE BOARD OF SUPERVISORS OF
ORANGE COUNTY, CALIFORNIA
DATE

WHEREAS, the Community Rating System (CRS) is a voluntary program for National Flood Insurance Program (NFIP) participating communities and the goals of the CRS are to reduce flood damages, strengthen and support the insurance aspects of the NFIP, and encourage a comprehensive approach to floodplain management; and

WHEREAS, the CRS was developed to provide incentives in the form of premium discounts for communities that go beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding; and

WHEREAS, pursuant to Resolution No. XXX, the County entered into an agreement with Tetra Tech, Inc., ADDRESS, for a thorough review of the floodplain management program in effect for the County, including a scoring evaluation in accordance with the 2025 Community Rating System (CRS) Manual and 2021 Addendum to the 2017 CRS Coordinator's Manual; and

WHEREAS, the County is an active participant in the CRS program and is presently a Class 5 community, which equates to a 25% reduction in flood insurance premiums for unincorporated County residents; and

WHEREAS, Orange County has developed a Multi-jurisdictional Hazard Mitigation Plan (OCHMP) which allows jurisdictions within the County to satisfy a critical pre-requisite requirement identified in Section 510 (Floodplain Management Planning) of the CRS Coordinator's Manual; and

WHEREAS, A proposal was received by the Orange County Public Works of MONTH, DAY, YEAR from Tetra Tech, Inc., ADDRESS to provide the above services, at a cost of $XXX; and

NOW, THEREFORE, be it RESOLVED, by the Orange County Board of Supervisors, California that the TITLE be and hereby is authorized to enter into an agreement with Tetra Tech, Inc., ADDRESS for professional consulting services to assist the County with the CRS Cycle Verification and to develop a Repetitive Loss Area Analysis, at a cost of $XXX Funds are available at Account No. XXX (NAME); and be it further

NOW, THEREFORE, BE IT RESOLVED that

1. The County of Orange Repetitive Loss Area Analysis is hereby adopted.

2. The Director of Public Works or designee is authorized, after review and approval by County Counsel, to make minor, non-substantive amendments to the County of Orange Repetitive Loss Area Analysis that do not materially alter the intent or scope of the Analysis.

Resolution No. YY- ___ Item No. <Clerk to complete upon adoption>
Adopt County of Orange Repetitive Loss Area Analysis
Page 1 of 1

APPENDIX G: RLAA ANNUAL PROGRESS REPORT TEMPLATE

Orange County, California
Repetitive Loss Area Analysis
Annual Progress Report

Reporting Period: {*Insert reporting period}*

Background: Orange County Public Works developed a floodplain management plan (FMP) to reduce its flooding risk by identifying resources, information, and strategies for risk reduction. In conjunction with the FMP, the County included a repetitive loss area analysis (RLAA) to further mitigate flood risk across the planning area. Orange County Public Works organized resources, assessed risks from flooding, developed planning goals and objectives, reviewed mitigation alternatives, and developed an action plan to address probable impacts from floods. The plan and analysis can be viewed on-line at:

[Insert website]

Summary Overview of the RLAA's Progress: The performance period for the RLAA became effective on ___, 2026, with the final plan being approved by the County Board of Supervisors. The initial performance period for this plan will be 5 years, with an anticipated update to the plan to occur before ___, 2031.

As of this reporting period, the performance period for this plan is considered to be__% complete. Table 2 reviews the action plan, reporting the status of each initiative.

The RLAA has targeted ____flood hazard mitigation initiatives to be pursued over the 5-year. performance period.

As of the reporting period, the following overall progress can be reported:

- ___out of __ initiatives (__%) reported ongoing action toward completion.
- ___out of __ initiatives (__%) were reported as being complete.
- ___out of __ initiatives (__%) reported no action taken.

Purpose: The purpose of this report is to provide an annual update and evaluation of the community's efforts to mitigate flood damage in the identified areas experiencing repetitive flooding. The objective is to ensure that there is a continuing and responsive planning process that will keep the RLAA dynamic and responsive to the needs and capabilities of Orange County and stakeholders. This report discusses the following:

- Review of repetitive loss property list
- Evaluation of mitigation actions
- Identification of new areas
- Outreach and education
- Recommendations and updates

The RLAA Steering Committee: The Steering Committee, made up of stakeholders within the County, reviewed and approved this progress report at its meeting held on _____, 202_. It was determined through the plan's development process that the Steering Committee would remain in service to oversee

maintenance of the plan. At a minimum, the Steering Committee will provide technical review, evaluation, and oversight on the development of the annual progress report. It is anticipated that there will be turnover in the membership annually, which will be documented in the progress reports. For this reporting period, Steering Committee membership is as indicated in Table 1.

Table 1. Steering Committee Members

Name	Organization	Alternate
Orange County Government Representatives		
Non-Voting Orange County Government Representatives		
Non-Government Representatives		

Review of Conditions and Repetitive Loss List: {Insert review of the flooding and building conditions as well as any changes to FEMA's repetitive loss list, to determine whether the number of buildings on the list or other circumstances have changed and revise the mapping and action items accordingly}.

- Changes in Flooding and building conditions {Provide update}
- Changes to the FEMA Repetitive Loss list {Provide updated list, denote changes}
- Are mapping revisions needed {Provide explanation, include revised maps if needed}
- Are action item revisions needed {Provide explanation, include revised actions if needed}

Summary of Previously Mitigation Repetitive Loss Areas: {Insert summary of previous mitigation efforts}

Current Mitigated Repetitive Loss Areas: {Insert a summary and list of the areas/properties that have changed status to mitigated or conditionally mitigated and provide a brief description}.

- Acquisition
- Structural projects
- Conditionally mitigated
- Repetitive loss properties not included in the RL areas

Unmitigated Repetitive Loss Areas: {Insert summary and list of unmitigated areas/properties and provide status update on what is needed in order to complete mitigation}

Review of the RLAA Action Plan: Table 2 reviews the action plan, reporting the status of each initiative. Reviewers of this report should refer to the RLAA for more detailed descriptions of each initiative and the prioritization process.

- Address the following in the "status" column of the following table:
  - Was any element of the initiative carried out during the reporting period? If no action was completed, why?
  - Is the timeline for implementation for the initiative still appropriate?
  - If the initiative was completed, does it need to be changed or removed from the action plan?

Table 2. RLAA Action Plan Matrix

RLA Number	Action	Location	Timeline	Priority	Status (No progress, in progress, complete, or discontinued)

Changes That May Impact Implementation of the RLAA: {Insert brief overview of any significant changes in the County that would have a profound impact on the implementation of the plan. Specify any changes in technical, regulatory and financial capabilities identified during the plan's development}

Recommendations for Changes or Enhancements: Based on the review of this report by the Steering Committee, the following recommendations will be noted for future updates or revisions to the plan:

- _____
- _____
- _____
- _____
- _____

_____

Public review notice: The contents of this report are considered to be public knowledge and have been prepared for total public disclosure. Copies of the report have been provided to the Orange County Board of Supervisors, to local media outlets, and is posted on the Orange County flood information website. Any questions or comments regarding the contents of this report should be directed to:

NAME/POC, TITLE
Orange County Public Works

County Administration
South
601 N. Ross Street,
Santa Ana, CA
92701
Phone:(714) 647-3999