



CITY OF LAGUNA HILLS TRAFFIC COMMISSION

REGULAR MEETING AGENDA Wednesday, March 15, 2023 – 7:00 PM

Chris Bieber - Vice Chair

Michael Caputo - Commissioner

Manuel Hernandez - Commissioner

Mark Schaff - Commissioner

Location: City Council Chamber, 24035 El Toro Road, Laguna Hills, CA 92653

Any person wishing to address the Traffic Commission on any matter, whether or not it appears on this Agenda, is asked to complete a "Request to Speak" form available on the table at the back of the Chamber. The completed form is to be submitted to the Recording Secretary prior to an individual being heard by the Traffic Commission. Completion of the form is voluntary. All persons may attend the meeting regardless of whether this form is completed.

Members of the public wishing to address the Traffic Commission can do so during the Public Comments portion of the Agenda with a time limitation of three minutes per person, an overall time limit of ten minutes for any one subject, and a total time limit of thirty minutes for Public Comments. If you are commenting on an Agenda item, your comments will be heard at the time that item is scheduled on the Agenda. If you are addressing the Commission on an item not listed on the Agenda, the Traffic Commission is prohibited by law from discussing or taking any action on that item.

CALL TO ORDER

Resolution No. 96-04-09-1 established rules of decorum for public meetings held by the City of Laguna Hills. Resolution No. 96-04-09-1 is available on the table at the back of the City Council Chamber.

PLEDGE OF ALLEGIANCE

ROLL CALL OF COMMISSION MEMBERS

1. PUBLIC COMMENTS

This is the time to address the Traffic Commission on any matter not listed on this Agenda that is within the subject matter jurisdiction of the Commission. Public Comments are limited to three minutes per person, an overall time limit of ten minutes for any one subject, and a total time limit of thirty minutes.

2. MINUTES

2.1 Minutes

Recommendation: That the Traffic Commission approve the Minutes of November 16, 2022.

3. PRESENTATIONS

3.1 Local Hazard Mitigation Plan

Recommendation: That the Traffic Commission: 1) Receive a presentation from De Novo Planning Group on the draft Local Hazard Mitigation Plan; 2) Allow public comments on the draft Local Hazard Mitigation Plan; and 3) Provide comments on the draft Local Hazard Mitigation Plan, if any.

4. ADMINISTRATIVE REPORTS

4.1 Electric Bicycle, Bicycle, and Motorized Mobility Device Safety

Recommendation: That the Traffic Commission: 1) Receive and file the report; and 2) Provide comments, if any, on the City staff written report presented at the November 16, 2022, meeting.

5. INFORMATIONAL ITEMS

5.1. Sheriff's Department Verbal Report

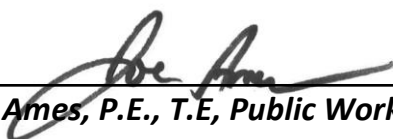
6. COMMISSIONER COMMENTS

7. ADJOURNMENT

The next Regular Meeting of the Traffic Commission will be May 17, 2023, at 7:00 p.m. in the City Council Chamber, located at 24035 El Toro Road, Laguna Hills California.

CERTIFICATION

I, JOE AMES. P.E., T.E., Public Works Director/City Engineer of the City of Laguna Hills, do hereby certify that a copy of the foregoing Agenda was posted at Laguna Hills City Hall, Laguna Hills Community Center, and the Courtyard at La Paz Center by March 9, 2023, at 5:00 p.m.



Joe Ames, P.E., T.E., Public Works Director/City Engineer

March 9, 2023

Date

In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, you should contact the office of the Public Works Director/City Engineer at (949) 707-2650. Notification 48 hours prior to the meeting will enable the City to make reasonable arrangements to assure access.

Materials related to an item on this Agenda submitted to the Commission after distribution of the Agenda packet are available for public inspection in the Public Services Department at 24035 El Toro Road, Laguna Hills, California, during normal business hours.



City of Laguna Hills

Traffic Commission

Staff Report

DATE: March 15, 2023
TO: Traffic Commissioners
FROM: Joe Ames
Public Works Director/City Engineer
ISSUE: Minutes

RECOMMENDATION: That the Traffic Commission approve the Minutes of November 16, 2022.

ATTACHMENTS:

- Minutes November 16, 2022

**CITY OF LAGUNA HILLS
TRAFFIC COMMISSION**

**REGULAR MEETING
MINUTES
Wednesday, November 16, 2022**

CALL TO ORDER

The meeting was called to order at 7:00 p.m. by Vice Chair Bieber.

PLEDGE OF ALLEGIANCE

The Pledge of Allegiance was led by Commissioner Schaff.

ROLL CALL OF COMMISSION MEMBERS

Attendee Name	Title	Status	Arrived
Chris Bieber	Vice Chair	Present	
Michael Caputo	Commissioner	Present	
Manuel Hernandez	Commissioner	Absent	
Mark Schaff	Commissioner	Present	

1. PUBLIC COMMENTS

There were no Public Comments.

2. MINUTES

2.1 Minutes

Recommendation: That the Traffic Commission approve the Minutes of July 20, 2022.

RESULT:	APPROVED [UNANIMOUS]
MOVER:	Michael Caputo, Commissioner
SECONDER:	Mark Schaff, Commissioner
AYES:	Chris Bieber, Vice Chair, Michael Caputo, Commissioner, Mark Schaff, Commissioner
ABSENT:	Manuel Hernandez, Commissioner

3. PRESENTATIONS

There were no Presentations.

4. ADMINISTRATIVE REPORTS

4.1 Electric Bicycle, Bicycle, and Motorized Mobility Device Safety

Recommendation: That the Traffic Commission: 1) Recommend any suggested modifications to the City staff report for presentation to City Council; 2) That the Traffic Commission receive and file the report made by Laguna Hills Police Services; and 3) That the Traffic Commission recommend the City Council direct Police Services to monitor and observe violations of State law and City codes related to motorized bicycles and devices and report back to the Commission in one year.

RESULT:	APPROVED [UNANIMOUS]
MOVER:	Mark Schaff, Commissioner
SECONDER:	Chris Bieber, Vice Chair
AYES:	Chris Bieber, Vice Chair, Michael Caputo, Commissioner, Mark Schaff, Commissioner
ABSENT:	Manuel Hernandez, Commissioner

4.2 Traffic Signal Master Plan Update and Construction of New Traffic Signals

Recommendation: That the Traffic Commission recommend: 1) City staff and its Traffic Engineering Consultant update the Traffic Signal Master Plan; and 2) City staff return to the Traffic Commission with recommendations on traffic signals to construct using available CARITS funding for approval by City Council.

RESULT:	APPROVED [UNANIMOUS]
MOVER:	Mark Schaff, Commissioner
SECONDER:	Chris Bieber, Vice Chair
AYES:	Chris Bieber, Vice Chair, Michael Caputo, Commissioner, Mark Schaff, Commissioner
ABSENT:	Manuel Hernandez, Commissioner

4.3 Speed Feedback Signs

Recommendation: That the Traffic Commission: 1) Approve the installation of two speed feedback signs, one on Paseo de Valencia and one on La Paz Road; and 2) Direct City staff to evaluate CARITS funding for a potential third speed feedback sign location.

RESULT:	APPROVED [UNANIMOUS]
MOVER:	Michael Caputo, Commissioner
SECONDER:	Mark Schaff, Commissioner
AYES:	Chris Bieber, Vice Chair, Michael Caputo, Commissioner, Mark Schaff, Commissioner
ABSENT:	Manuel Hernandez, Commissioner

4.4 Radar Trailer Schedule

Recommendation: That the Traffic Commission receive and file the report.

RESULT:	APPROVED [UNANIMOUS]
MOVER:	Michael Caputo, Commissioner
SECONDER:	Mark Schaff, Commissioner
AYES:	Chris Bieber, Vice Chair, Michael Caputo, Commissioner, Mark Schaff, Commissioner
ABSENT:	Manuel Hernandez, Commissioner

4.5 Do Not Block Intersection Signs

Recommendation: That the Traffic Commission recommend: 1) City staff present a Resolution to the City Council for adoption authorizing the establishment of "Do Not Block Intersection" locations and signage at the discretion of the City Engineer.

RESULT:	APPROVED [UNANIMOUS]
MOVER:	Michael Caputo, Commissioner
SECONDER:	Chris Bieber, Vice Chair
AYES:	Chris Bieber, Vice Chair, Michael Caputo, Commissioner, Mark Schaff, Commissioner
ABSENT:	Manuel Hernandez, Commissioner

5. INFORMATIONAL ITEMS

5.1. Sheriff's Department Verbal Report

Chief of Police De la Rosa gave a power point presentation and responded to Commissioner requests for additional information during Agenda Item 4.1, Electric Bicycle, Bicycle, and Motorized Mobility Device Safety.

6. COMMISSIONER COMMENTS

There were no Commissioner Comments.

7. ADJOURNMENT

There being no further business before the Traffic Commission at this session, Vice Chair Bieber declared the meeting adjourned at 9:11 p.m.

Julie Comella, Administrative Assistant

ATTEST:

Chris Bieber, Vice Chair

Approved at meeting of March 15, 2023



City of Laguna Hills

Traffic Commission

Staff Report

DATE: March 15, 2023
TO: Traffic Commissioners
FROM: Joe Ames
Public Works Director/City Engineer
ISSUE: Local Hazard Mitigation Plan

RECOMMENDATION: That the Traffic Commission: 1) Receive a presentation from De Novo Planning Group on the draft Local Hazard Mitigation Plan; 2) Allow public comments on the draft Local Hazard Mitigation Plan; and 3) Provide comments on the draft Local Hazard Mitigation Plan, if any.

SUMMARY:

On January 19, 2022, the Traffic Commission received an agenda report titled "Development of a Citywide Local Hazard Mitigation Plan" wherein City staff and the City's consultant, De Novo Planning Group, made a presentation on the purpose of a Local Hazard Mitigation Plan (LHMP) and Program. The development of a LHMP is a prerequisite for accessing both Federal and State mitigation funding to address the impact of disasters. At the January 19, 2022, meeting, City staff and the City's consultant requested input from the Commission on potential natural and manmade hazards in the community where actions should be taken to reduce the impact of those hazards on life and property to include in the LHMP. The draft LHMP has been completed and posted for public comment on the City's website. Now, the Traffic Commission should provide comments on the draft LHMP and solicit public comments for possible inclusion in the final LHMP.

BACKGROUND:

The City received grant funding from the California Governor's Office of Emergency Services for the preparation of a Local Hazard Mitigation Plan (LHMP) and has retained

Local Hazard Mitigation Plan

March 15, 2023

Page 2

the services of De Novo Planning Group for assistance with the development of this Plan. The LHMP identifies the types of hazards (e.g. earthquakes, flooding, and wildfires) that threaten our community, evaluates our vulnerability to those threats, and outlines a strategy to reduce or eliminate the risk posed by those threats, as well as to reduce the potential cycle of repeated destruction by natural hazard events.

The Federal Emergency Management Agency (FEMA) states that disasters, which can cause loss of life, damage buildings and infrastructure, and have devastating consequences for a community's economic, social, and environmental well-being, should be anticipated and addressed through hazard mitigation. Hazard mitigation is the effort to reduce loss of life and property by lessening the impact of disasters. Hazard mitigation has the potential to keep natural hazards from becoming natural disasters. Hazard mitigation is best accomplished when based on a comprehensive, long-term plan developed before a disaster strikes.

Therefore, development of a LHMP is a prerequisite for accessing both Federal and State mitigation funding, which may result in the potential for great economic assistance should there be a significant local disaster.

Now, the Traffic Commission should provide comments on the draft LHMP and solicit public comments for possible inclusion in the final LHMP as part of the required public participation process. De Novo Planning Group, will consider all input from the Commission and the public, and will integrate it into the final LHMP where appropriate.

A PowerPoint presentation will be provided to help guide this discussion.

DISCUSSION:

Additional discussion on this topic can be found in the January 19, 2022, Traffic Commission meeting agenda packet and meeting video posted on the City's website at: <http://lagunahillsca.ig2.com/Citizens/FileOpen.aspx?Type=1&ID=1563&Inline=True>

FISCAL IMPACT:

None.

ATTACHMENTS:

- Draft Local Hazard Mitigation Plan

PUBLIC REVIEW DRAFT

City of Laguna Hills

Local Hazard Mitigation Plan

PREPARED BY:

City of Laguna Hills
24035 El Toro Road
Laguna Hills, California 92653
Contact: Joe Ames, P.E., T.E., Public Works Director/City Engineer

WITH ASSISTANCE FROM:

De Novo Planning Group
180 E. Main Street, Suite 108
Tustin, California 92780
Contact: Starla Barker, AICP

February 2023



Laguna Hills Local Hazard Mitigation Plan

TABLE OF CONTENTS

Section 1.0 Introduction	1-1
1.1 Plan Purpose	1-1
1.2 Plan Authority	1-2
1.3 Plan Adoption	1-4
1.4 Plan Organization.....	1-4
1.5 Mitigation Goals	1-5
Section 2.0 Planning Process	2-1
2.1 Forming The Planning Team	2-2
2.1.1 Project Management Team	2-2
2.1.2 LHMP Planning Team.....	2-2
2.1.3 Public Outreach	2-6
2.1.4 Review and Incorporate Existing Information	2-8
2.2 Assess Risks	2-9
2.2.1 Identify/Profile Hazards	2-9
2.2.2 Assess Vulnerabilities.....	2-9
2.3 Develop Mitigation Plan	2-10
2.3.1 Identify Goals.....	2-10
2.3.2 Develop Capabilities Assessment	2-10
2.3.3 Identify Mitigation Actions	2-10
2.3.4 Plan Review and Revision	2-10
2.3.5 Plan Adoption and Submittal	2-10
2.3.6 Plan Maintenance.....	2-11
Section 3.0 Community Profile	3-1
3.1 Physical Setting.....	3-1
3.2 History	3-1
3.3 Demographics.....	3-2
3.3.1 Population	3-2
3.3.2 Educational Attainment.....	3-5
3.3.3 Employment	3-6
3.3.4 Housing	3-6
3.3.5 Household Characteristics	3-7



Laguna Hills Local Hazard Mitigation Plan

3.4	General Plan Land Uses and Development	3-7
3.5	Development Trends and Future Development	3-13
3.6	Infrastructure Systems	3-15
3.6.1	Transportation	3-15
3.6.2	Water and Wastewater	3-15
3.6.3	Electricity	3-17
3.6.4	Natural Gas	3-17
Section 4.0 Risk and Vulnerability Assessment		4-1
4.1	Hazard Identification and Prioritization	4-1
4.2	Hazard Profiles	4-4
4.2.1	Dam/Reservoir Failure	4-4
4.2.2	Drought	4-11
4.2.3	Flood	4-19
4.2.4	Human-Induced Hazards	4-26
4.2.6	Seismic and Geologic Hazards	4-33
4.2.7	Severe Weather	4-46
4.2.8	Wildfire and Urban Fires	4-55
4.3	Vulnerability/Risk Assessment	4-61
Section 5.0 Hazard Mitigation Strategy		5-1
5.1	Capabilities Assessment	5-1
5.2	Hazard Mitigation Overview	5-12
5.2.1	FEMA's National Flood Insurance Program	5-12
5.2.2	Hazard Mitigation Goals	5-13
5.2.3	Hazard Mitigation Prioritization	5-13
5.2.4	Hazard Mitigation Benefit – Cost Review	5-15
5.3	Hazard Mitigation Actions	5-16
Section 6.0 Plan Maintenance		6-1
6.1	Method and Schedule for Maintaining and Updating the Plan	6-1
6.1.1	Purpose and Authority	6-1
6.1.2	Annual Plan Monitoring and Maintenance	6-3
6.1.3	Five-Year Update	6-4
6.2	Adoption	6-5
6.3	Incorporation Into Existing Programs and Planning Mechanisms	6-5
6.4	Continued Public Involvement	6-7
6.5	Point of Contact	6-7



Laguna Hills Local Hazard Mitigation Plan

Section 7.0 References..... 7-1

List of Appendices

Appendix A City Adoption Resolution

Appendix B Planning Process Documentation



Laguna Hills Local Hazard Mitigation Plan

LIST OF FIGURES

Figure 1-1: Disaster Response Cycle	1-2
Figure 3-1: Regional Location Map	3-3
Figure 3-2: Laguna Hills Planning Area	3-4
Figure 3-3: General Plan Land Use Map	3-8
Figure 4-1: Dam Inundation Areas.....	4-10
Figure 4-2: Drought Monitor Map	4-15
Figure 4-3: U.S. Seasonal Drought Outlooks	4-18
Figure 4-4: FEMA Flood Zones	4-23
Figure 4-5: Types of Faults.....	4-33
Figure 4-6: Earthquake Shaking Potential	4-39
Figure 4-7: Landslide Hazard Zones	4-41
Figure 4-8: Liquefaction Hazard Zones.....	4-43
Figure 4-9: Heat Index.....	4-51
Figure 4-10: Fire Hazard Severity Zones	4-57
Figure 4-11: Wildland-Urban Interface	4-58
Figure 4-12: Laguna Hills Critical Facilities and Facilities of Concern.....	4-66



Laguna Hills Local Hazard Mitigation Plan

LIST OF TABLES

Table 2-1: DMA CFR Crosswalk	2-1
Table 2-2: LHMP Planning Team.....	2-4
Table 2-3: Planning Team Meeting Summary	2-6
Table 2-4: Primary Plan Resources	2-8
Table 3-1: Laguna Hills and Orange County Population and Housing Data (2019).....	3-2
Table 3-2: Laguna Hills and Orange County Racial and Ethnic Composition (2019)	3-5
Table 3-3: Laguna Hills and Orange County Educational Attainment (2019)	3-6
Table 3-4: Laguna Hills and Orange County Household Characteristics (2019).....	3-7
Table 3-5: Land Use Designations	3-9
Table 3-6: Laguna Hills Development Capacity (2030)	3-13
Table 3-7: Laguna Hills RHNA Allocation (2021-2029)	3-14
Table 4-1: Laguna Hills Hazard Identification.....	4-2
Table 4-2: Dams and Reservoirs	4-9
Table 4-3: Drought Severity Classification	4-14
Table 4-4: Historical Droughts.....	4-16
Table 4-5: Acreage by FEMA Flood Zones	4-22
Table 4-6: Leaking Underground Storage Tank Sites.....	4-28
Table 4-7: CAL OES Historical Hazmat Spill Notifications in Laguna Hills Since 2010	4-31
Table 4-8: Richter Scale of Earthquake Magnitude	4-37
Table 4-9: The Modified Mercalli Intensity Scale.....	4-38
Table 4-10: Major Earthquake Faults of Particular Concern.....	4-44
Table 4-11: Significant Historical Earthquakes in Southern California	4-45
Table 4-12: Likelihood of Earthquakes Occurring in the Next 30 Years	4-46
Table 4-13: Saffir-Simpson Hurricane Wind Scale	4-50
Table 4-14: Orange County Extreme Heat Events	4-53
Table 4-15: Major Wildfires in Orange County History	4-59



Laguna Hills Local Hazard Mitigation Plan

Table 4-16: Laguna Hills Critical Facilities and Facilities of Concern.....	4-63
Table 4-17: Critical Facilities In Dam Inundation Areas	4-67
Table 4-18: Critical Facilities In a 100-Year Flood Hazard Zone	4-68
Table 4-19: Critical Facilities In a Landslide Zone	4-70
Table 4-20: Critical Facilities In a Liquefaction Zone	4-71
Table 4-21: Critical Facilities In Wildland-Urban Interface	4-73
Table 4-22: Risk Assessment Summary	4-74
Table 5-1: Capabilities Assessment.....	5-2
Table 5-2: STAPLEE/E Review and Selection Criteria	5-14
Table 5-3: Hazard Mitigation Actions	5-17



Section 2.0 | Planning Process

This section describes each stage of the planning process used to develop the LHMP. The LHMP planning process provides a framework to document the plan's development and follows the Federal Emergency Management Agency (FEMA)-recommended steps. The LHMP follows a prescribed series of planning steps which includes organizing resources, assessing risk, developing the mitigation plan, drafting the plan, reviewing and revising the plan, and adopting and submitting the plan for approval. Each step is described in this section.

Hazard mitigation planning in the United States is guided by statutory regulations described in the Disaster Mitigation Act of 2000 (DMA 2000) and implemented through Title 44 Code of Federal Regulations (CFR) Parts 201 and 206. FEMA's hazard mitigation plan guidelines outline a four-step planning process for the development and approval of hazard mitigation plans. Table 2-1, *DMA 2000 CFR Crosswalk*, lists the specific CFR excerpts that contain the requirements for approval, and identifies the applicable section of this LHMP.

TABLE 2-1: DMA 2000 CFR CROSSWALK

DMA 2000 (44 CCFR 201.6)	2021 Laguna Hills LHMP Section
(1) Organize Resources	Section 2
201.6(c)(1)	Organize to prepare the plan
201.6(b)(1)	Involve the public
201.6(c)(2) and (3)	Coordinate with other agencies
(2) Assess Risks	Section 4
201.6(c)(2)(i)	Assess the hazard
201.6(c)(2)(ii) and (iii)	Assess the problem
(3) Development the Mitigation Plan	Section 5
201.6(c)(3)(i)	Set goals (Section 1)
201.6(c)(3)(ii)	Review possible activities (actions)
201.6(c)(3)(iii)	Draft an action plan
(4) Plan Maintenance	Section 6
201.6(c)(5)	Adopt the plan
201.6(c)(4)	Implement, evaluate, and revise



Laguna Hills Local Hazard Mitigation Plan

2.1 FORMING THE PLANNING TEAM

2.1.1 PROJECT MANAGEMENT TEAM

The City of Laguna Hills contracted with De Novo Planning Group to assist with development of the LHMP. A core Project Management Team, consisting of City Staff and the Consultant Team, was assembled to organize, facilitate, and execute preparation of the LHMP. The Project Management Team was responsible for day-to-day coordination of the LHMP work program, including forming and assembling the Planning Team; scheduling Planning Team meetings; preparing, reviewing, and disseminating Planning Team meeting materials; coordinating, scheduling and participating in community engagement activities and meetings; and, coordinating document review.

2.1.2 LHMP PLANNING TEAM

The Project Management Team identified a list of participants, which included City staff, adjacent jurisdictions, partner agencies, service providers, and organizations, as potential LHMP Planning Team members. City Staff Planning Team members represented the following City Departments:

- General Government
- Community Services
- Public Services

An invitation was sent via email to individuals advising them of the City's efforts to prepare a LHMP and requesting their participation in preparation of the plan, including an invitation for participation in up to four Planning Team meetings. The invitation included a request to identify a potential designee if the specific contact was unable to participate; a copy of the correspondence is included in Appendix B. An invitation was sent to the following agencies and organizations:

- City of Aliso Viejo
- City of Irvine
- City of Laguna Niguel
- City of Laguna Woods
- City of Lake Forest



Laguna Hills Local Hazard Mitigation Plan

- City of Mission Viejo
- City of Rancho Santa Margarita
- Orange County Fire Authority
- Orange County Sheriff's Department
- Orange County Public Works
- El Toro Water District
- Moulton Niguel Water District
- SDG&E
- Southern California Edison
- Southern California Gas Company
- Saddleback Hospital
- Orange County Health Care Agency
- Irvine Unified School District
- Saddleback Unified School District

Together, the Planning Team worked to ensure the success of the planning process. The team's key responsibilities included:

- Participation in Planning Team meetings
- Collection of local information and other requested data
- Providing agency-specific knowledge and input
- Assistance with the public engagement process
- Decision on plan process and content
- Development and prioritization of mitigation actions
- Review and comment on the draft LHMP

Table 2-2, *LHMP Planning Team*, identifies the Planning Team members that directly participated in the Planning Team meetings and their roles in the LHMP development process.



Laguna Hills Local Hazard Mitigation Plan

TABLE 2-2: LHMP PLANNING TEAM

Organization	Name, Title	Planning Team Role
Project Management Team		
City of Laguna Hills	Ken Rosenfield Interim City Manager/Director of Public Services	LHMP Management and Planning Team – Oversight and input on development and organization of Planning Team and meetings, participation in Planning Team meetings, development of and participation in community outreach, hazard identification, capabilities assessment, mitigation actions and prioritization, and plan review. Served as primary point of contact for City and Consultant Project Management Team, Planning Team, and Public.
City of Laguna Hills	Dan Meehan Community Services Superintendent	Assistant to David Reynolds. Hazard identification, capabilities assessment, mitigation actions and prioritization, plan review.
City of Laguna Hills	Joe Ames, P.E., T.E. Public Works Director/City Engineer	Hazard identification, capabilities assessment, mitigation actions and prioritization, plan review.
City of Laguna Hills	Amber Shah Assistant City Engineer	Hazard identification, capabilities assessment, mitigation actions and prioritization, plan review.
Neighboring Cities		
City of Lake Forest	Amy Stonich Assistant Director of Community Development	Hazard identification, capabilities assessment, plan review.
City of Lake Forest	Ashley Melchor Management Assistant	Hazard identification, capabilities assessment, plan review.
City of Mission Viejo	Paul Catsimanes Emergency Services Manager	Hazard identification, capabilities assessment, plan review.
City of Mission Viejo	Michelle Claud-Clemente Animal Services Manager	Hazard identification, capabilities assessment, plan review.
City of Rancho Santa Margarita	Cheryl Kuta Director of Development Services	Hazard identification, capabilities assessment, plan review.
Emergency Service Providers		
Orange County Fire Authority	TJ McGovern Division 5 Chief	Hazard identification, capabilities assessment, mitigation actions and prioritization, plan review.
Orange County Fire Authority	Nick Pivaroff Assistant Fire Marshal	Hazard identification, capabilities assessment, mitigation actions and prioritization, plan review.



Laguna Hills Local Hazard Mitigation Plan

Organization	Name, Title	Planning Team Role
Orange County Fire Authority	Jason Lopez Division 5 Captain	Hazard identification, capabilities assessment, mitigation actions and prioritization, plan review.
Orange County Sheriff's Department	Matthew Stiverson Captain	Hazard identification, capabilities assessment, mitigation actions and prioritization, plan review.
Orange County Sheriff's Department Emergency Management Division	Michelle Anderson Emergency Management Division Director	Hazard identification, capabilities assessment, mitigation actions and prioritization, plan review.
Utility/Infrastructure Service Providers		
Orange County Public Works	James Tyler Manager – Flood Programs	Hazard identification, capabilities assessment, mitigation actions and prioritization, plan review.
Orange County Public Works	Nardy Khan Deputy Director	Hazard identification, capabilities assessment, mitigation actions and prioritization, plan review.
Orange County Public Works	Penny Lew Senior Civil Engineer	Hazard identification, capabilities assessment, mitigation actions and prioritization, plan review.
El Toro Water District	Sherri Seitz Public Relations Administrator	Hazard identification, capabilities assessment, mitigation actions and prioritization, plan review.
Moulton Niguel Water District	Todd Novacek Director of Operations	Hazard identification, capabilities assessment, mitigation actions and prioritization, plan review.
Moulton Niguel Water District	Len Barton Safety & Compliance Coordinator	Hazard identification, capabilities assessment, mitigation actions and prioritization, plan review.
SDG&E	Duane Cave External Relations Manager	Hazard identification, capabilities assessment, mitigation actions and prioritization, plan review.
Hospitals/Health Care Agencies		
Saddleback Hospital	Antonio (Tony) Garcia Facilities Manager	Hazard identification, capabilities assessment, mitigation actions and prioritization, plan review.
Saddleback Hospital	Jason Gray Executive Director	Hazard identification, capabilities assessment, mitigation actions and prioritization, plan review.
Saddleback Hospital	Dagian Kokesch Coordinator of Plant Operations and Safety	Hazard identification, capabilities assessment, mitigation actions and prioritization, plan review.
School Districts		
Saddleback Valley Unified School District	Robert Craven Assistant Superintendent	Capabilities assessment, mitigation actions and prioritization, plan review.



Laguna Hills Local Hazard Mitigation Plan

Organization	Name, Title	Planning Team Role
Orange County Department of Education	Miguel Padilla Maintenance	Capabilities assessment, mitigation actions and prioritization, plan review.

The LHMP Planning Team held three meetings, as summarized in Table 2-3, *Planning Team Meeting Summary*. Meeting materials, including PowerPoint presentations, sign-in sheets, agendas, meeting summaries, and other relevant handouts are provided in Appendix B.

TABLE 2-3: PLANNING TEAM MEETING SUMMARY

Meeting	Date	Discussion Items
1	November 18, 2021	• Introductions • Project Goals, Objectives, and Expectations • Purpose and Requirements of the LHMP • Hazard Identification and Prioritization • Critical Facilities
2	December 16, 2021	• Data Needs • Summary of Hazards/Hazard Profiles • Risk Assessment Methodology • Critical Facilities and Facilities of Concern • Capabilities Assessment
3	March 10, 2022	• Risk Assessment/Vulnerability Overview • Mitigation Strategy Discussion • Survey Summary

Separate from the Planning Team meetings, discussions occurred with individuals and organizations on the Planning Team, as well as outside of the Planning Team to obtain additional information to further help inform the LHMP. This included, but was not limited to, information from the Nellie Gail Emergency Preparedness Committee.

2.1.3 PUBLIC OUTREACH

A public outreach and engagement strategy was developed to solicit public involvement and input in the LHMP planning process. Components of the public outreach program are described below; refer to Appendix B for outreach materials.

WEBPAGE

A webpage on the City's website provided information on the LHMP, including a description of a hazard mitigation plan, its importance, and how the public could be involved in the planning process. A link to complete the community survey was provided along with a contact at the City for any comments or questions. The website was



Laguna Hills Local Hazard Mitigation Plan

updated throughout the planning process and provided notifications and access to LHMP materials. The draft LHMP was also made available for review.

COMMUNITY SURVEY

A community survey was developed to obtain input from the public about various hazard mitigation topics. In addition to basic demographic information, the survey asked residents to identify specific safety concerns, including what hazards they felt were most likely to impact their neighborhood or property. Residents were also asked what actions they had taken to be more resistant to hazards. Information gained from the survey was used by the Planning Team to identify potential mitigation actions that would reduce damage and disruption from disaster or emergency events.

The survey was made available for completion on the LHMP webpage and the survey link was distributed via email by the City and Planning Team members. The survey received 38 responses.

COMMISSION MEETINGS

A presentation providing an overview of hazard mitigation, purposes of the LHMP, LHMP development process, hazard profiles, public outreach, and overall schedule was provided to the City of Laguna Hills Transportation Commission, and to the Parks and Recreation Commission as part of their regularly scheduled meetings on January 19, 2022 and February 2, 2022, respectively. These meetings were accessible in-person and online. The meetings are also recorded and posted on the City's website. The presentation provided opportunities for the commission members to ask questions and provide input on the hazard profiles and topics of concern for consideration as part of the LHMP development process.

PUBLIC REVIEW DRAFT LHMP

A public review draft LHMP was made available to the public for review and comment, beginning February 3, 2023 and ending March 6, 2023. The draft LHMP was made available on the LHMP webpage and at the City's Public Services counter. Information was provided on how to submit comments or ask questions regarding the draft LHMP.



Laguna Hills Local Hazard Mitigation Plan

2.1.4 REVIEW AND INCORPORATE EXISTING INFORMATION

The LHMP Planning Team referenced a variety of plans, studies, data, and technical reports available from local, State, and federal sources to prepare the LHMP. Primary resources reviewed and incorporated as part of the LHMP planning process are listed in Table 2-4, *Primary Plan Resources*. A complete list of resources is included in Section 7.0, *References*.

TABLE 2-4: PRIMARY PLAN RESOURCES

Plans, Studies, Reports and Other Technical Data/Information	Planning Process/Area of Document Inclusion
Cal Fire	Hazard Profiles; Vulnerability Assessment; Mitigation Strategy
Cal-Adapt	Hazard Profiles; Vulnerability Assessment; Mitigation Strategy
California Department of Water Resources	Hazard Profiles
California Geological Survey	Hazard Profiles; Vulnerability Assessment
City of Laguna Hills Bridge Report	Hazard Profiles; Vulnerability Assessment
City of Laguna Hills General Plan and EIR	Community Profile; Hazard Profiles; Mitigation Strategy
City of Laguna Hills Wildland Urban Interface Fire Plan	Hazard Profiles, Mitigation Strategy
County of Orange and Orange County Fire Authority LHMP, December 2021	Hazard Profiles; Vulnerability Assessment
County of Orange and Orange County Operational Area: Flood, Dam and Reservoir Failure, May 2019 (Draft)	Hazard Profiles
County of Orange and Orange County Operational Area: Joint Information System Annex, November 2018	Hazard Profiles
El Toro Water District Annex, August 2019	Hazard Profiles
FEMA Local Hazard Mitigation Plan Guidance	Multiple plan sections
FEMA Map Service Center	Hazard Profiles; Vulnerability Assessment
Moulton Niguel Water District Annex, August 2019	Hazard Profiles
National Drought Mitigation Center	Hazard Profiles; Vulnerability Assessment
OC Health Care Agency	Hazard Profiles; Vulnerability Assessment
OC Parks Firewood Policy, February 2018	Hazard Profiles; Vulnerability Assessment
OC Public Works	Hazard Profiles
Orange County Fire Authority 2020 Unit Strategic Fire Plan	Hazard Profiles
Orange County Fire Authority Evacuation Maps	Hazard Profiles
Orange County Fire Authority Laguna Hills Ember Zones, September 2012	Hazard Profiles
Orange County Regional Water and Wastewater MJHMP, August 2019	Hazard Profiles; Vulnerability Assessment



Laguna Hills Local Hazard Mitigation Plan

Plans, Studies, Reports and Other Technical Data/Information	Planning Process/Area of Document Inclusion
SCAG Local Housing Data for the City of Laguna Hills, April 2021	Community Profile; Vulnerability Assessment
SCAG Local Profiles Report for the City of Laguna Hills, 2019	Community Profile; Vulnerability Assessment
South Orange County Integrated Regional Water Management Plan	Hazard Profiles
State of California Multi-Hazard Mitigation Plan, September 2018	Hazard Profiles
Unified County of Orange and Orange County Operational Area: Emergency Operations Plan, February 2019.	Hazard Profiles
US Census American Community Survey	Community Profile; Vulnerability Assessment
US Drought Monitor	Hazard Profiles; Vulnerability Assessment

2.2 ASSESS RISKS

In accordance with FEMA requirements, the LHMP Planning Team identified the natural hazards affecting Laguna Hills and assessed the community's associated vulnerability from those hazards. Results from this phase of the LHMP planning process aided subsequent identification of appropriate mitigation actions to reduce risk from these hazards; refer to Section 5.0, *Mitigation Strategy*.

2.2.1 IDENTIFY/PROFILE HAZARDS

Based on a review of past hazards, as well as a review of existing plans, reports, and other technical studies, data, and information, the LHMP Planning Team determined if specific hazards were valid and identified other hazards that could affect the City. Content for each hazard profile is provided in Section 4.0, *Hazards Assessment*.

2.2.2 ASSESS VULNERABILITIES

Hazard profiling exposed the unique characteristics of individual hazards and begins the process of determining which areas within the City are vulnerable to specific hazard events. The vulnerability assessment included input from the LHMP Planning Team and a GIS overlaying method for hazard risk assessments. Using these methodologies, critical facilities and facilities of concern impacted by hazards were identified and potential loss estimates were determined, where available. The vulnerability assessments for each hazard are provided in Section 4.0.



Laguna Hills Local Hazard Mitigation Plan

2.3 DEVELOP MITIGATION PLAN

2.3.1 IDENTIFY GOALS

Mitigation goals were identified to guide the specific mitigation actions aimed at reducing risk and preventing loss associated with natural and human-induced hazards. The Mitigation goals are presented in Section 1.5, *Mitigation Goals*.

2.3.2 DEVELOP CAPABILITIES ASSESSMENT

A capabilities assessment is a comprehensive review of all the various mitigation capabilities and tools currently available to the City to implement the mitigation actions prescribed in the LHMP. The LHMP Planning Team identified the planning and regulatory; administrative and technical; financial; and education and outreach capabilities to implement mitigation actions, as detailed in Section 5.0, *Hazard Mitigation Strategy*.

2.3.3 IDENTIFY MITIGATION ACTIONS

As part of the LHMP planning process, the LHMP Planning Team worked to identify and develop mitigation actions, after which they were prioritized as high, medium, or low. The process began with the Planning Team identifying issues or concerns associated with the profiled hazards and potential ways in which the issue or concern could be addressed. During this process, the capabilities assessment was also referenced to better understand if the capability already existed and needed to be expanded, or if the capability was not currently available. Mitigation actions developed as part of the previous unapproved plan were also considered. A detailed discussion of the identification and prioritization of mitigation actions is provided in Section 5.0, *Hazard Mitigation Strategy*.

2.3.4 PLAN REVIEW AND REVISION

As previously noted, once the draft LHMP was completed, a public review period was provided from February 3, 2023 to March 6, 2023, to allow public review and comments. Comments received on the draft LHMP were reviewed and the LHMP was revised, as appropriate.

2.3.5 PLAN ADOPTION AND SUBMITTAL

This plan will be submitted to Cal OES and FEMA for review. Upon receiving “approvable pending adoption” notification from FEMA, this plan will be presented to the City Council



Laguna Hills Local Hazard Mitigation Plan

for their consideration. If approved, a copy of the resolution will be provided in Appendix A.

2.3.6 PLAN MAINTENANCE

Plan maintenance procedures, found in Section 6.0, *Plan Maintenance*, include the measures the City will take to ensure the LHMP's continuous long-term implementation. The procedures also include the manner in which the LHMP will be regularly monitored, reported upon, evaluated, and updated to remain a current and meaningful planning document.



Laguna Hills Local Hazard Mitigation Plan

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Section 3.0 | Community Profile

3.1 PHYSICAL SETTING

The City of Laguna Hills is located in the San Joaquin Hills in southern Orange County, approximately 60 miles south of Los Angeles and 70 miles north of San Diego; refer to Figure 3-1, *Regional Location Map*. The City is comprised of 4,234 acres (6.6 square miles), all of which is located within the City's incorporated limits; refer to Figure 3-2, *Laguna Hills Planning Area*. Since all land surrounding the City is under the jurisdiction of other cities, Laguna Hills does not have a planning sphere of influence or any planning authority outside of its jurisdictional boundaries. Laguna Hills is bounded by the cities of Irvine and Lake Forest to the north; Interstate 5 (I-5) and the cities of Mission Viejo and Lake Forest to the east; the City of Laguna Niguel to the south; and, the cities of Aliso Viejo and Laguna Woods to the west. Regional access is provided by I-5 and the San Joaquin Hill Transportation Corridor (State Route 73).

3.2 HISTORY

Laguna Hills is built on one of the major land grants developed during the Rancho Era. Following Mexico's independence from Spain in 1821, those who had served in the government or who had friends in authority, were given vast lands for cattle grazing. Rancho Lomas de Santiago, Rancho San Joaquin, and Rancho Niguel covered much of the western portion of the Saddleback Valley. Don Juan Avila was granted the 13,000-acre Rancho Niguel on which Laguna Hills is located.

In 1874, Lewis Moulton purchased Rancho Niguel from Don Juan Avila and increased the original grant to 22,000 acres. Moulton and his partner, Jean Piedra Daguerre, used the ranch to raise sheep and cattle. The Moulton Ranch was eventually subdivided in the early 1960s, part of which is recognized as Laguna Hills.

Incorporation efforts began in 1987 and on March 5, 1991, the goal of incorporation was achieved with 86 percent of the residents voting in favor of forming the City of Laguna Hills. On December 20, 1991, Laguna Hills officially became a City. Since incorporation, two annexations have occurred. On November 14, 1995, the City Council approved annexation of the north Laguna Hills area, which became part of the incorporated City on July 1, 1996. The annexation added approximately 755 acres of land with various designations such as residential, mixed-use, commercial, open space and parks. On



Laguna Hills Local Hazard Mitigation Plan

September 18, 2000, the "Westside" Annexation Area officially became part of the incorporated City. The annexation added 149 acres of residential land, which includes the Aliso Viejo Community Association's Sheep Hills Park. The original incorporation boundaries and two annexation areas form the City's incorporated boundaries and the Planning Area addressed in this Plan.

3.3 DEMOGRAPHICS

Basic demographic data for Laguna Hills (population, education, employment, and housing) obtained from the US Census 2015-2019 American Community Survey (ACS) is summarized below.¹

3.3.1 POPULATION

Table 3-1, *Laguna Hills and Orange County Population and Housing Data (2019)*, provides an overview of the City's and County's demographics.

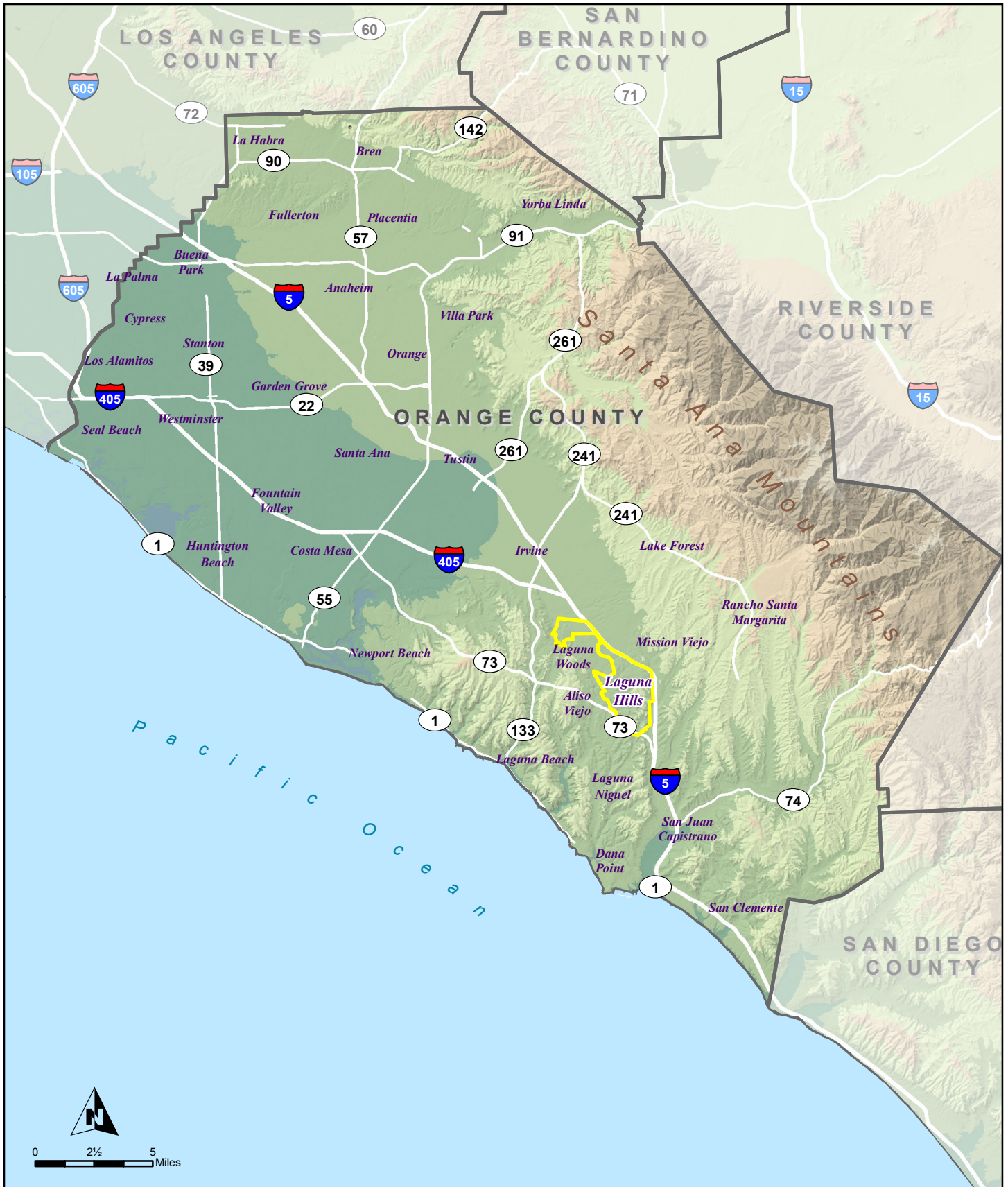
TABLE 3-1: LAGUNA HILLS AND ORANGE COUNTY POPULATION AND HOUSING DATA (2019)

Category	Laguna Hills	Orange County
Total Population	31,617	3,168,044
Percent of Residents that are children (under 18 years)	20.4%	22.2%
Percent of Residents that are senior citizens (65 and over)	17.2%	14.4%
Median Age (years)	42.8	38.1
Median Household Income	\$100,985	\$90,234
Median House Value	\$707,700	\$679,300
Occupied Housing Units	11,037	103,7492
Percent of Renter Occupied	27.5%	42.6%

Source: US Census American Community Survey 5-Year Estimates 2015-2019.

Laguna Hills 2019 estimated population was 31,617 residents. When compared to Orange County, the City has a higher household income, home ownership rate, and median house value. The City has a lower percentage of residents under 18 and a higher percentage of residents over 65 when compared to the County. The median age of City residents was 42.8, higher than the median age of Orange County residents at 38.1. Approximately 20.4 percent of the population was below the age of 18 and approximately 17.2 percent was above the age of 65.

¹ The 2015-2019 American Community Survey (ACS) 5-year estimates is the most current 5-year data profile available. It represents 60 months of collected data and provides the most reliable and largest data set.

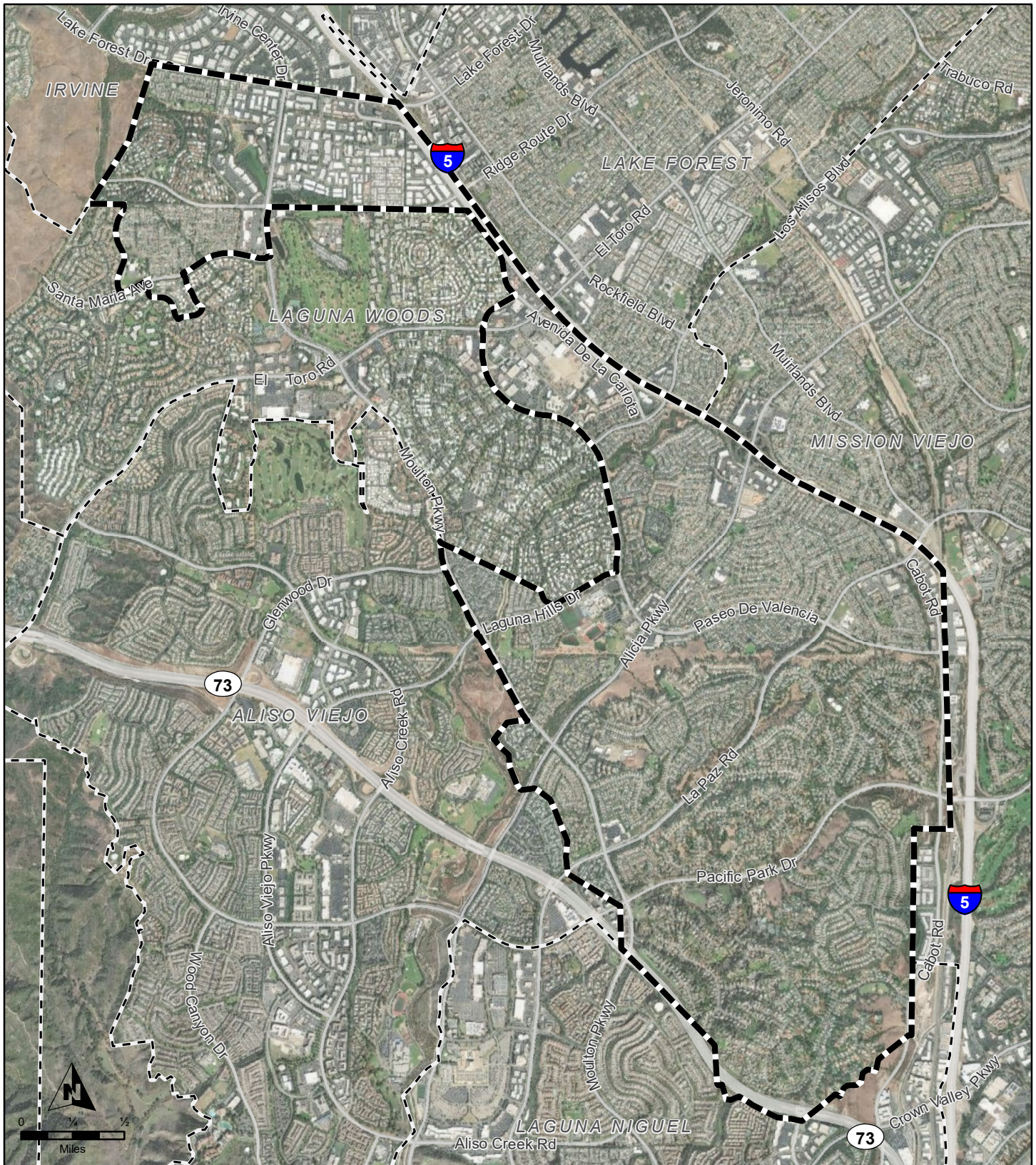


Legend

- City of Laguna Hills
- County Boundary

CITY OF LAGUNA HILLS
LOCAL HAZARD MITIGATION PLAN

Figure 3-1. Regional Location Map



Legend

-  City of Laguna Hills
-  Other Incorporated Area

CITY OF LAGUNA HILLS
LOCAL HAZARD MITIGATION PLAN

Figure 3-2. Laguna Hills Planning Area



Laguna Hills Local Hazard Mitigation Plan

A greater percentage of Laguna Hills residents identify as white when compared to Orange County; refer to Table 3-2, *Laguna Hills and Orange County Racial and Ethnic Composition (2019)*. Hispanic or Latino persons of any race constitute 22.0 percent of the City's residents compared to 34.1 percent of County residents. Asians make up 14.7 percent of the population. Persons identifying as "other race" account for 6.4 percent of the population, while those reporting two or more races make up 6.5 percent of the City's population.

TABLE 3-2: LAGUNA HILLS AND ORANGE COUNTY RACIAL AND ETHNIC COMPOSITION (2019)

Category	Laguna Hills		Orange County	
	Population	Percentage of Population	Population	Percentage of Population
White	22,417	70.9%	1,931,263	61.0%
Black or African American	470	1.5%	55,591	1.8%
American Indian and Alaskan Native	27	0.1%	14,424	0.5%
Asian	4,632	14.7%	649,042	20.5%
Native Hawaiian and Other Pacific Islander	18	0.1%	10,152	0.3%
Other Race	2,012	6.4%	377,563	11.9%
Two or More Races	2,041	6.5%	130,009	4.1%
Hispanic or Latino (of any race) ¹	6,950	22.0%	1,078,726	34.1%
Total	31,617	100%	3,168,044	100%

Source: US Census American Community Survey 5-Year Estimates 2015-2019.

1. Hispanic or Latino persons are not counted as a separate racial or ethnic category; persons who identify as Hispanic or Latino are also included in other racial or ethnic categories.

3.3.2 EDUCATIONAL ATTAINMENT

When compared to Orange County, Laguna Hills residents have a higher level of education attainment; refer to Table 3-3, *Laguna Hills and Orange County Educational Attainment (2019)*. Of the City's population that is 25 years or older, 18.6 percent attained a graduate or professional degree, 31.9 percent attained a bachelor's degree, and 10.4 percent attained an associate degree. Approximately 7.9 percent of adults in Laguna Hills have not completed high school compared to 14.5 percent of adults in the County.



Laguna Hills Local Hazard Mitigation Plan

TABLE 3-3: LAGUNA HILLS AND ORANGE COUNTY EDUCATIONAL ATTAINMENT (2019)

Educational Attainment (25 years and older)	Laguna Hills		Orange County	
	Population	Percentage of Population	Population	Percentage of Population
Less than 9 th Grade	853	3.8%	170,972	7.9%
9 th to 12 th Grade, no diploma	925	4.1%	144,073	6.6%
High School Graduate	2,922	12.9%	373,447	17.2%
Some College, No Degree	4,173	18.4%	432,294	19.9%
Associate Degree	2,358	10.4%	167,552	7.7%
Bachelor's Degree	7,236	31.9%	564,720	26.0%
Graduate or Professional Degree	4,219	18.6%	315,366	14.5%
Total	22,686	100%	2,168,424	100%

Source: US Census American Community Survey 5-Year Estimates 2015-2019.

3.3.3 EMPLOYMENT

Of the 26,039 residents over 16 years of age, 17,206 were in the labor force. Out of the 17,206 people in the labor force, 16,482 (95.8 percent) were employed and 724 (4.2 percent) were unemployed. The educational services and health care/social services sector employed the largest number of City residents (19.5 percent), followed by professional scientific, management, administrative, and waste management services (14.2 percent) and arts, entertainment, recreation, accommodation and food services (12.3 percent). The median household income in the City was \$100,985. While approximately 7.2 percent of employees work from home, a majority of Laguna Hills' residents commute outside of the City for work. The average commute travel time is 25.3 minutes.²

3.3.4 HOUSING

In 2019, there were 11,037 housing units (i.e., households)³ in Laguna Hills; refer to Table 3-4, *Laguna Hills and Orange County Household Characteristics (2019)*. The most prevalent type of housing within Laguna Hills is single-family detached units, consisting of approximately 56.6 percent of the housing stock. Most of the housing was built between 1970 and 2001 (SCAG, 2021). The California Department of Finance estimates an average household size of 2.84 persons per household (DOF, 2021).

² This data was collected prior to the COVID-19 pandemic, which affected workforces across the country, including Laguna Hills. Generally, the pandemic resulted in more employees (particularly white-collar employees) working from home.

³ The count of occupied housing units is the same as the count of households; see <https://www.census.gov/housing/hvs/definitions.pdf>



Laguna Hills Local Hazard Mitigation Plan

TABLE 3-4: LAGUNA HILLS AND ORANGE COUNTY HOUSEHOLD CHARACTERISTICS (2019)

Household Type	Laguna Hills		Orange County	
	Population	Percent	Population	Percent
Families	7,726	70.0%	744,011	71.7%
With children	2,935	26.6%	320,601	30.9%
Single Persons	2,340	21.2%	218,911	21.1%
65 Years and Older	960	8.7%	95,449	9.2%
Non-family	3,311	30.0%	293,481	28.3%
Total Households	11,037	100.0%	1,037,492	100.0%
Average Household Size	2.8		3.0	
Average Family Size	3.4		3.5	

Source: US Census American Community Survey 5-Year Estimates 2015-2019.

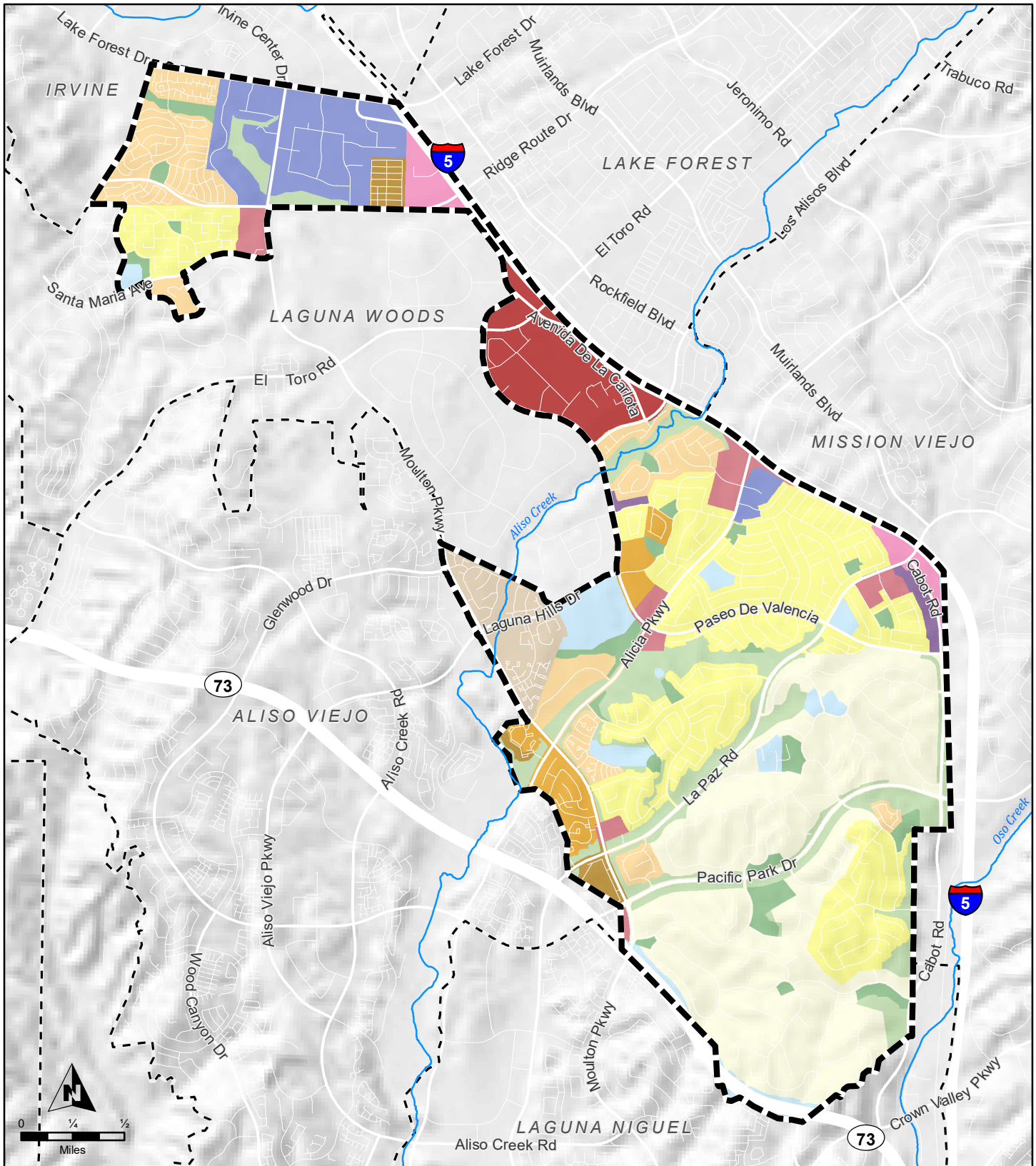
3.3.5 HOUSEHOLD CHARACTERISTICS

In Laguna Hills, families constituted 70.0 percent of the 11,037 households in the City, a proportion slightly less than in Orange County (71.7 percent). Families with children represented 26.6 percent of households in Laguna Hills and 30.9 percent in Orange County. Single-person households represented 21.2 percent of households in Laguna Hills, while there was a similar proportion of single-person households in Orange County (21.1 percent).

Household size identifies sources of population growth and household overcrowding. In general, a city's average household size will increase over time if there is a trend toward larger families. In communities where the population is aging, the average household size may decline. The average household size for Laguna Hills in the 2015-2019 period was 2.8, which was slightly lower than Orange County, with an average household size of 3.0.

3.4 GENERAL PLAN LAND USES AND DEVELOPMENT

Development of the City is guided by its General Plan. The Laguna Hills General Plan assigns land use designations to all land located within its incorporated boundaries; refer to Figure 3-3, *General Plan Land Use Map*. Table 3-5, *Land Use Designations*, identifies the current General Plan land use designations and descriptions of the typical uses allowed in each designation. Table 3-6, *Laguna Hills Development Capacity (2030)*, identifies the General Plan development capacity for the City.



Legend

City of Laguna Hills	MD: Medium Density Residential	CC: Community Commercial
Other Incorporated	HD: High Density Residential	OP: Office Professional
ER: Estate Residential	PC: Planned Community	MU: Mixed Use
LD: Low Density Residential	VC: Village Commercial	P/I: Public/Institutional
MLD: Medium-Low Density Residential	FC: Freeway Commercial	OS: Open Space
		PK: Park

CITY OF LAGUNA HILLS LOCAL HAZARD MITIGATION PLAN

Figure 3-3.
General Plan Land Use Map

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

Sources: Orange County GIS; City of Laguna Hills. Map date: December 9, 2021.



Laguna Hills Local Hazard Mitigation Plan

TABLE 3-5: LAND USE DESIGNATIONS

Land Use	Maximum DUs/Net Acre or Maximum FAR/Net Acre	Summary Description of Land Use Designation
Residential Land Use		
Estate Residential (ER)	0-3.5 du/ac	Estate Residential provides for low density, rural and equestrian-oriented, single-family residential neighborhoods in hillside areas. This designation is typified by large lot single-family homes that permit the keeping of large animals.
Low Density Residential (LD)	3.0-6.5 du/ac	Low Density Residential provides for low density single-family detached residential neighborhoods. This designation is typified by medium to large lot single-family homes.
Medium-Low Density Residential (MLD)	6.5-12.5 du/ac	Medium-Low Density Residential provides for medium-low density attached or detached residential neighborhoods. This designation is typified by small lot single-family homes, patio homes, duplexes, condominiums, and townhomes.
Medium Density Residential (MD)	12.5-18.0 du/ac	Medium Density Residential provides for medium density multi-family residential neighborhoods. This designation is typified by condominiums and apartments.
High Density Residential (HD)	18.0-30.0 du/ac	High Density Residential provides for intensive residential development compatible with surrounding urban development. This designation is typified by apartments and residential condominiums.
Planned Community Land Use		
Planned Community (PC)*	0.5-18.0 du/ac; 0.75 FAR	Planned Community provides for a wide range of housing types, from estates on large lots to attached dwelling units (townhomes, condominiums, and clustered arrangements). This category permits the greatest flexibility for residential development. It also provides for high-intensity mixed use development. Appropriate land uses include but are not limited to residential, commercial, office, industrial park, civic, cultural, educational facility, and childcare facilities. This category is intended to facilitate a more efficient use of existing and future transportation systems, conserve energy resources, and develop residential densities



Laguna Hills Local Hazard Mitigation Plan

Land Use	Maximum DUs/Net Acre or Maximum FAR/Net Acre	Summary Description of Land Use Designation
		that enhance the availability to provide affordable housing. The designation is characterized by a diversity of housing opportunities. The Planned Community district is located adjacent to major transportation corridors and is accessible to public transit facilities. A goal of this category is to foster around-the-clock activity by encouraging the mixing of activities thereby reducing the impacts on the transportation system.
Planned Community Residential (PCR)*	Maximum total 600 dwelling units	Planned Community Residential provides for a wide range of medium-low density to high density multi-family housing types, which include apartments, attached townhomes, condominiums, and clustered multi-family arrangements. Appropriate land uses include residential and 10 to 13 acres of recreational land uses such as parks and open space.
Commercial Land Use		
Village Commercial (VC)*	No FAR restrictions Max 50 du/ac	The Village Commercial designation is envisioned as a master planned area (Urban Village Specific Plan area) containing specific design standards and policies that enhance pedestrian and vehicle circulation within the currently developed area. The intent of this designation is to establish a community core where commercial, civic, and high density residential uses would be appropriate. The area will contain enhanced pedestrian areas that conveniently link commercial, residential, and civic activity areas. Typical uses include those associated with large regional malls, as well as a medical center, financial institutions, institutional and government uses, auto-related services, community facilities, professional offices, and high density residential uses.
Freeway Commercial (FC)	0.40 FAR	The Freeway Commercial designation provides for the development and maintenance of medium intensity commercial uses that serve the needs of the



Laguna Hills Local Hazard Mitigation Plan

Land Use	Maximum DUs/Net Acre or Maximum FAR/Net Acre	Summary Description of Land Use Designation
		motoring public in the local community and the regional area. This designation is intended to provide an environment that takes advantage of the superior access and visibility provided by I-5. Typical uses include those uses allowed under the Community Commercial designation, restaurants, discount warehouse outlets, service stations, and hotels and motels.
Community Commercial (CC)	0.35 FAR	The Community Commercial designation provides appropriately located areas for the general shopping and commercial service needs of area residents. Typical uses include general retail, markets, commercial services, restaurants, automotive repair and service, hardware and home improvement centers, commercial recreation, professional and business offices, financial institutions, and automotive sales.
Office Land Uses		
Office Professional (OP)	0.50 FAR	The Office Professional designation provides for the establishment of office-based working environments for administrative and professional offices, as well as necessary support uses. Typical uses include administrative and professional offices, business-related retail and service functions, health care facilities, and vocational and trade schools.
Mixed-Use Land Uses		
Mixed-Use (MXU)	0.38 FAR Max 20 du/ac	The Mixed-Use designation provides for areas where a variety of goods and services can be obtained within an overall planned environment. Within the Mixed-Use designation, appropriate land uses include limited industrial and manufacturing uses, administrative and professional uses, institutional and government uses, business support uses, auto-related uses, eating and drinking establishments, personal services, and retail sales of durable goods and general retail sales, and residential uses.
Neighborhood Mixed-Use (NMU)	0.38 FAR (0.30 non-residential)	The Neighborhood Mixed-Use designation provides areas for a variety of different,



Laguna Hills Local Hazard Mitigation Plan

Land Use	Maximum DUs/Net Acre or Maximum FAR/Net Acre	Summary Description of Land Use Designation
	FAR and 0.08 residential FAR)	compatible land uses to exist in proximity. The intent of the Neighborhood Mixed Use designation is to create attractive neighborhood-level centers that promote a more active, vibrant street life; increase pedestrian activity and reduce vehicular traffic; provide storefront style shopping streets; that provide a variety of compact, multi-family housing types close to jobs and services; and/or encourage walking and social interaction. Within the Neighborhood Mixed-Use designation, appropriate land uses include mid-box anchors; administrative and professional uses; grocery and specialty stores; business support uses; eating and drinking establishments; cinemas; personal services; residential condos, apartments, and townhomes; and mixed-use structures.
Public/Institutional Land Uses		
Public/Institutional (P/I)*	1.0 FAR	The Public/Institutional designation provides areas to conduct public and institution activities, including local, State, and federal agencies; special districts; public and private utilities; and regional institutions. Appropriate uses include City facilities; public and private schools; fire and sheriff stations; hospitals; libraries; post offices; and other public, quasi-public, and institutional uses.
Recreation Land Uses		
Parks (P)	No FAR restrictions	The Park designation provides for recreational facilities, as well as to protect public health and safety. Park designations consist of active and passive parks. Active parks generally contain ball fields, play equipment, restrooms; and biking, hiking, and equestrian trails. Community gardens may also be considered for some parks.
Open Space (OS)	Not intended for development	The Open Space designation provides for the preservation of environmental resources, aesthetic attributes, outdoor recreation, buffering of incompatible land uses, and the protection of public health and safety. No density or intensity standard is applied to this



Laguna Hills Local Hazard Mitigation Plan

Land Use	Maximum DUs/Net Acre or Maximum FAR/Net Acre	Summary Description of Land Use Designation
		designation. Areas designated as Open Space include creek corridors, utility corridors, publicly maintained open space, and open space reserves and preserves.

Source: City of Laguna Hills, General Plan Land Use Element.

* Residential development allowed within this land use designation.

TABLE 3-6: LAGUNA HILLS DEVELOPMENT CAPACITY (2030)

Land Use Category	Existing	Planned	Anticipated Net Change by 2030
Nonresidential			
Retail (square feet)	2,567,450	3,119,780	528,830
Office (square feet)	1,856,570	2,260,940	415,170
Business Park (square feet)	1,496,620	1,571,450	74,830
Nonresidential Subtotal (square feet)	5,920,640	6,952,170	1,031,530
Hotel (rooms)	212	462	250
Residential			
Single-family (dwelling units)	6,194	6,201	7
Multi-family (dwelling units)	4,992	5,442	450
Residential Subtotal (dwelling units)	11,186	11,643	457
Public/Institutional			
Public/Government/Civic (square feet)	331,720	331,720	0
Parks and Recreation			
Parks and Recreation (acreage)	133.94	144.68*	10.74*
Open Space			
Open Space (acreage)	413.10	410.83	-2.27

Source: City of Laguna Hills, General Plan EIR 2009.

*Estimate 10-13 acres in Via Lomas Opportunity Area

3.5 DEVELOPMENT TRENDS AND FUTURE DEVELOPMENT

The SCAG 6th Cycle Final Regional Housing Needs Assessment (RHNA) Allocation Plan was approved in March 2021 and identifies housing growth by county and city to accommodate projected population growth needs. The City of Laguna Hills is currently in the process of updating its Housing Element to accommodate the RHNA projected housing needs. The RHNA Allocation for Laguna Hills is outlined in Table 3-7, *Laguna Hills RHNA Allocation (2021-2029)*.



Laguna Hills Local Hazard Mitigation Plan

TABLE 3-7: LAGUNA HILLS RHNA ALLOCATION (2021-2029)

Income Category	2021-2029 RHNA
Very Low	568
Low	353
Moderate	354
Above Moderate	710
Total	1,985

Source: SCAG RHNA, 2021.

As shown in Table 3-7, the RHNA plan allocated 1,985 new housing units to Laguna Hills for the October 2021 through October 2029 planning period. Although the City is required to provide adequate land to accommodate the 1,985 new housing units, the City is not required to build housing.

In addition to potential housing development associated with implementation of the City's Housing Element, there is the potential for additional non-residential development to occur within the City. The City is primarily developed with minimal vacant sites for development; therefore, development would likely occur within underutilized sites or associated with redevelopment of currently developed sites.

The Urban Village Specific Plan (UVSP), adopted in November 2002, is a 240-acre area bounded by Paseo de Valencia on the north and west, Los Alisos Boulevard on the south, and Interstate 5 on the east. The UVSP provides for a continuing mixture of land uses, including retail, residential hotel, medical offices, and general offices. The UVSP area is designated in the City's General Plan and Zoning Ordinance as Village Commercial (VC). All new development within the Village Commercial district is subject to the UVSP. The purpose of the UVSP area is to develop an urban core in which a variety of public, regional commercial, recreational, and high-density residential uses work in concert to create an urban village.

In March 2016, the City approved a plan for the renovation of the Laguna Hills Mall, an approximately 68-acre subarea located within the UVSP, which included approximately 880,000 square feet of new and renovated commercial retail space, movie theaters, restaurants, and 988 residential units. The approved plan was known as Five Lagunas. Subsequently, the property owner of Five Lagunas, Merlone Geier Partners (MGP), informed City staff that they could not move forward with the approved 2016 plan because they did not think the market would support the approved Five Lagunas project. Since then, several revised configurations have been discussed for the project, renamed as The Village at Laguna Hills. On March 8, 2022, the City approved the proposed modification to the previous 2016 Five Laguna Project development approval. The Village at Laguna Hills Proposed 2021 Project would allow for up to 250,000 square feet



Laguna Hills Local Hazard Mitigation Plan

of commercial, retail restaurant, cinema and health club uses, up to 465,000 square feet of office, up to 1,500 residential units and a hotel with 100-150 rooms.

3.6 INFRASTRUCTURE SYSTEMS

Infrastructure systems within the City, such as roadways, water and wastewater facilities, electricity, and natural gas, provide vital community and individual functions. These facilities and distribution systems are primarily owned, operated, and maintained by other agencies. The ability for infrastructure systems to remain operational during hazard events and emergencies will contribute to the City's ability to withstand or recover sooner from hazard events.

3.6.1 TRANSPORTATION

Regional access is provided via the I-5, and State Route 73 (SR-73). I-5 travels in a north-south direction east of the City, then passes through the northern portion of the City, while SR-73 travels in a north-south direction west of the City, connecting with neighboring south Orange County cities. According to the City's General Plan, there are seven major arterial roadways providing primary ingress and egress in the City: Alicia Parkway, El Toro Road, Lake Forest Drive, Los Alisos Boulevard, Moulton Parkway, Oso Parkway, and Paseo de Valencia (El Toro Road to La Paz Road). Inspection and maintenance of the City's transportation facilities are critical to ensuring their protection against disasters, such as earthquakes.

3.6.2 WATER AND WASTEWATER

Laguna Hills is served by two water providers: El Toro Water District (ETWD) and Moulton Niguel Water District (MNWD). These services are provided in the northern portion of the City by the ETWD and in the southern portion of the City by the MNWD. The division line runs through a neighborhood north of Alicia Parkway and south of Aliso Creek. Several major water lines run through or near Laguna Hills. The Joint Regional Transmission Main, Eastern Transmission Main, and Central Intertie Pipeline traverse through the City. The South County Pipeline, jointly owned by Santa Margarita Water District (SMWD) and the Municipal Water District of Orange County (MWDOC) runs to the east of the City, but could result in potential flooding damage within the City if it is compromised.

ETWD operates 12 different pressure zones, six reservoirs, eight pump stations, 19 pressure reducing stations and manages 180 miles of water mains with approximately 9,500 service connections (Arcadis, 2021). MNWD's system consists of 655 miles of potable



Laguna Hills Local Hazard Mitigation Plan

water distribution pipelines, 25 pump stations, and 13 potable water pressure reducing stations and flow control facilities, as well as 141 miles of recycled mainline, 12 recycled water pump stations, and 13 recycled water pressure reducing stations (MNWD, 2021).

ETWD and MNWD are members of MWDOC. MWDOC is a member of the Metropolitan Water District of Southern California (MWD). Nearly all MWDOC water supply is purchased from MWD, which imports the water from the Colorado River Aqueduct (a small portion comes from Northern California through the State Water Project).

Since a majority of the City's water supplies are transported from outside of the area, damage to water conveyance systems in and outside of the area could interfere with the ability to provide water to the City.

ETWD and MNWD are also responsible for the collection of wastewater within the City. ETWD's wastewater collection system includes approximately 158 miles of sewer pipelines and 11 sewer lift stations. Almost all the wastewater generated within ETWD's service area is conveyed to its Water Recycling Plant (WRP) where it is treated and either used for irrigation or disposed of through South Orange County Wastewater Authority's (SOCWA's) effluent transmission main and ocean outfall. SOCWA is a joint powers agency comprised of ten governmental agencies, which operates three regional treatment plants and two ocean outfalls. A small portion of flow on the southeast side of ETWD is conveyed directly to the MNWD collection system. MNWD's wastewater system consists of approximately 540 miles of wastewater collection pipelines and 19 lift stations. MNWD operates its own wastewater treatment plant, Plant 3A, and is a member of SOCWA. Water reclaimed by both ETWD and MNWD is used for irrigation purposes only. Damage to wastewater conveyance infrastructure and treatment facilities could occur as a result of a hazard event. Depending upon the nature and extent of the damage, a leak in a sewer pipe could pose a risk to the community's health and the environment and damage to a treatment facility could reduce capacity at the facility.

ETWD and MNWD are participating agencies in the Orange County Regional Water and Wastewater Multi-Jurisdictional Hazard Mitigation Plan (MJHMP). The MJHMP is comprised of the primary plan and 19 jurisdiction-specific annexes. ETWD and MNWD have identified mitigation actions to reduce the risk of damage to water and wastewater facilities and improve overall resiliency of their infrastructure systems and operations.



Laguna Hills Local Hazard Mitigation Plan

3.6.3 ELECTRICITY

Southern California Edison (SCE) and San Diego Gas & Electric (SDG&E) provide electricity to Laguna Hills. Electricity is distributed from power plants through power lines and substations. Within Laguna Hills, most powerlines are located underground. Damage to a substation or the larger distribution system outside of the City could result in power loss to the City. More localized power losses can also occur in the event underground transmission lines are damaged.

3.6.4 NATURAL GAS

Southern California Gas (SoCalGas) provides gas service to Laguna Hills. A major gas transmission pipeline runs adjacent to the railroad on the City's eastern border and passes through the City near La Paz Road and Cabot Road. Other gas transmission pipelines and high pressure (greater than 60 pounds per square inch) gas distribution mains run through other areas of Orange County. Damage to these facilities could interfere with natural gas service in the City. Similarly, more localized disruptions could occur in the event lower pressure distribution mains and smaller service lines connected to the gas meters at homes and businesses are damaged.



Laguna Hills Local Hazard Mitigation Plan

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Section 4.0 | Risk and Vulnerability Assessment

4.1 HAZARD IDENTIFICATION AND PRIORITIZATION

HAZARD IDENTIFICATION

The first step in developing the risk assessment is identifying the hazards. Federal Emergency Management Agency (FEMA) guidance identifies several hazards that may affect communities. The list of hazards is comprehensive, but not meant to be exhaustive or limit a community from identifying other hazards within their plans. Additionally, a community may not be susceptible to all hazards identified for consideration. In reviewing the County of Orange and Orange County Fire Authority Local Hazard Mitigation Plan (OC LHMP), the California State Hazard Mitigation Plan (SHMP), the Laguna Hills General Plan Safety Element, and the FEMA list of hazards, the Planning Team used these documents as a reference point and discussed the potential for a specific hazard to affect the community. The discussion considered previous occurrences within the City and surrounding area and the Planning Team's professional experience and knowledge. Input from the Transportation Commission, and Parks and Recreation Commission further informed the hazards.

Table 4-1, *Laguna Hills Hazard Identification*, summarizes the Planning Team's discussion and determination of hazards for inclusion in the LHMP.

As part of the hazard identification process, the Planning Team determined that some hazards could be combined or included within a larger hazard category. In addition, some hazards were renamed to reflect the specific hazard affecting Laguna Hills. Therefore, for purposes of the hazard profiles, ground shaking, liquefaction, and landslide are all addressed under the heading of Seismic Hazards. Severe Weather includes heavy winds (Santa Ana winds) and rain events (including El Nino years). Human-induced hazards include hazardous materials spills/releases and cyber threat.



Laguna Hills Local Hazard Mitigation Plan

TABLE 4-1: LAGUNA HILLS HAZARD IDENTIFICATION

Hazards	Include in City LHMP?	Discussion of Hazard's Inclusion or Exclusion
Avalanche	No	Avalanches are not applicable to Laguna Hills.
Climate Change	Yes	Climate change is not a discrete hazard, but may change the characteristics of a hazard that affects the community, such as frequency and intensity. Climate change is discussed within each of the applicable hazard profiles.
Coastal Erosion	No	Not applicable due to distance from the coast.
Coastal Storm	No	Not applicable due to distance from the coast.
Dam/Reservoir Failure	Yes	Dams and reservoirs occur within and around the City and their potential failure could impact the City.
Disease/Pest Management	No	The City has not experienced significant disease or pest management issues warranting inclusion within the LHMP.
Drought	Yes	The City depends on groundwater and imported surface water, both of which are susceptible to drought.
Earthquake Fault Rupture	No	There are no faults located within or immediately adjacent to the City. Hazards associated with earthquake ground shaking are addressed within Seismic Hazards.
Expansive Soils	No	Expansive soils are not a significant concern within the City.
Extreme Heat	No	Extreme heat conditions are rare within Laguna Hills. Climate change and the potential to contribute to the severity of a hazard is addressed within the applicable hazard profiles (e.g., drought, wildfires)
Flood	Yes	FEMA-identified floodplains associated with creeks are located within the City. Localized flooding, typically during heavy rain events, has also occurred and resulted in damage.
Geological Hazards	Yes	Geological hazards that occur within the City are primarily associated with landslides, mudflows, and slope instability. These are addressed under Seismic and Geologic Hazards.
Hailstorm	No	The City does not typically experience significant hailstorms.
Hazardous Materials	Yes	Hazardous materials are not generated within the City. Potential impacts associated with hazardous materials are more likely associated with a hazardous material spill along major transportation routes. Hazardous materials spill/release is addressed under Human-induced Hazards.
Human-induced Hazards	Yes	Human-induced hazards, including hazardous materials spill/release and cyber threat have been identified for inclusion within the LHMP.
Hurricane	No	Hurricanes do not occur within the City.
Land Subsidence	No	Land subsidence is not a significant concern within the City.
Landslide and Mudflow	Yes	Portions of the City are located within areas identified as having a potential to experience seismic-induced landslides. Additionally, due to the topography of the City,



Laguna Hills Local Hazard Mitigation Plan

Hazards	Include in City LHMP?	Discussion of Hazard's Inclusion or Exclusion
		there is the potential for slope instability and mudflows. These topics are addressed within Seismic and Geologic Hazards.
Lightning	No	The City does not typically experience significant lightning events resulting in damage.
Liquefaction	Yes	Portions of the City are located within areas identified as having the potential for liquefaction. Liquefaction is addressed under Seismic Hazards.
Sea-Level Rise	No	Not applicable due to distance from the coast.
Seismic Hazards	Yes	The City is located within an area of southern California susceptible to earthquake ground shaking and associated seismic hazards, including liquefaction. These topics are addressed within Seismic and Geologic Hazards.
Severe Winter Storm	Yes	The City does not typically experience severe winter storms. However, Laguna Hills does experience heavy rain events with extended durations. Heavy rains events are addressed within Severe Weather.
Tornado	No	Tornadoes do not occur within the City.
Tsunami	No	Not applicable due to distance from the coast.
Volcano	No	The City is not located within an active volcano area.
Wildfire	Yes	Although the City is not located within an area identified as having high fire hazard areas, there are areas adjacent to the City and within the surrounding region that have been identified as very high fire hazard severity zones. Wildfire and Urban Fire will be profiled within the LHMP.
Wind	No	Regular wind does not occur within the City.
Windstorm	Yes	The City experiences high wind events associated with Santa Ana wind conditions. These events are addressed within Severe Weather.

Source: City of Laguna Hills, 2022.

Climate change is not a stand-alone hazard but has the potential to exacerbate other natural hazards in the City. As such, the Planning Team determined it would be best to discuss climate change considerations within each applicable hazard profile. Similarly, power outage (both planned and unplanned) could occur as a result of several hazards, resulting in secondary impacts within the community. Power outage is discussed in detail in the Severe Weather Profile and is also cross referenced in other relevant hazard profiles.

The following hazards are discussed within the LHMP:

- Climate Change (integrated into each hazard)
- Dam/Reservoir Failure



Laguna Hills Local Hazard Mitigation Plan

- Drought
- Flood
- Human-Induced Hazards (hazardous material spills/release, cyber threat)
- Seismic and Geologic Hazards (ground shaking, liquefaction, landslide, mudflows, slope instability)
- Severe Weather (heavy rains, Santa Ana wind events)
- Wildfire and Urban Fire

4.2 HAZARD PROFILES

This section contains profiles for the hazards identified as having the potential to occur in Laguna Hills. Each hazard includes a description of the hazard, location of where the hazard may occur, severity of the hazard, history of the hazard, and the probability of the hazard's future occurrence.

4.2.1 DAM/RESERVOIR FAILURE

DESCRIPTION

A dam is an artificial barrier preventing the flow of water or loose solid materials (such as soil or snow) or a barrier built across a watercourse for impounding water. Dam failure is the uncontrolled release of impounded water from behind a dam. Flooding, earthquakes, blockages, landslides, lack of maintenance, improper operation, poor construction, vandalism, and terrorism can all cause a dam to fail. Dam failure causes downstream flooding that can affect life and property.

Reservoirs are defined as an artificial lake, pond, impoundment or tank, used to store water. Reservoirs can be created on the surface by constructing dams to store water. Additionally, tank reservoirs can be constructed to store water either above ground, on the surface, or below ground. Reservoir failure is the uncontrolled release of impounded water from a reservoir. Similar to dams, flooding, earthquakes, blockages, landslides, lack of maintenance, improper operation, poor construction, vandalism, and terrorism activities can all cause a reservoir to fail. Seismic activity may also cause inundation by the action of a differential movement of a reservoir and the water within, causing shearing or buckling of the reservoir infrastructure.



Laguna Hills Local Hazard Mitigation Plan

Dam or reservoir failures are most likely to happen for the following reasons (Association of State Dam Safety Officials, 2021):

- Overtopping, caused by water spilling over the top of a dam; usually a precursor of dam failure because of inadequate spillway design, debris blockage of spillways, or settlement of the dam crest.
- Foundation defects, including settlement and slope instability.
- Cracking caused by natural settling of a dam or seismic movements.
- Inadequate maintenance and upkeep.
- Piping, when seepage through a dam is not properly filtered, soil particles continue to progress and form sinkholes in the dam.

FEMA and the California Governor's Office of Emergency Services (Cal OES) require all dam owners to develop an Emergency Action Plan (EAP) for warning, evacuation, and post-flood actions. In the event of a major dam failure, mutual aid from all levels of government would be required for an extended period of time. Recovery efforts would include the removal of debris, clearing roadways, demolishing unsafe structures, assistance in reestablishing public services, and providing continued care for the affected population.

Dams are regulated by the Department of Water Resources, Division of Safety of Dams (DSOD). DSOD ensures dam safety by (DWR 2022):

- Reviewing and approving dam enlargements, repairs, alterations, and removals, and ensuring that the dam appurtenant structures are designed to meet minimum requirements.
- Performing independent analyses to understand dam and appurtenant structures performance, including structural, hydrologic, hydraulic, and geotechnical evaluations.
- Overseeing construction to ensure work is performed in accordance with approved plans and specifications.
- Inspecting each dam on an annual basis to ensure it is safe, performing as intended, and not development issues.
- Periodically reviewing the stability of dams and their major appurtenances in light of improved design approaches and requirements, as well as new findings regarding earthquake hazards and hydrologic estimates in California.



Laguna Hills Local Hazard Mitigation Plan

DSOD is responsible for assigning each jurisdictional dam a downstream hazard potential. The downstream hazard potential is based on potential downstream impacts to life and property should the dam fail when operating with a full reservoir. The downstream hazard is not related to the condition of the dam or the likelihood of the dam to fail in either the short- or long-term. Dams in southern California usually do not operate at full capacity at all times of the year, and thus hazard risks and classifications are a worst-case scenario assessment. The DSOD definitions for downstream hazards are borrowed from the Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures. FEMA categorizes the downstream hazard potential into three categories – low, significant and high – DSOD adds a fourth category of extremely high (DWR 2021):

- Low: No probable loss of human life and low economic and environmental losses. Losses are expected to be principally limited to the owner's property.
- Significant: No probable loss of human life but can cause economic loss, environmental damage, impacts to critical facilities, or other significant impacts.
- High: Expected to cause loss of at least one human life.
- Extremely High: Expected to cause considerable loss of human life or would result in an inundation area with a population of 1,000 or more.

DSOD uses the US Army Corps of Engineer's National Inventory NID's condition assessment rating definition as a guideline in assigning condition assessments. A dam safety deficiency is defined as a load capacity limit or other issue that can result in a failure of the dam or appurtenant structure. It is a characteristic or condition that does not meet the applicable minimum regulatory criteria. Conditions assessment definitions are as follows:

- | | |
|--------------|---|
| Satisfactory | No existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all loading conditions (static, hydrologic, seismic) in accordance with the minimum applicable state or federal regulatory criteria or tolerable risk guidelines.
Typical Circumstances: <ul style="list-style-type: none">▪ No existing deficiencies or potentially unsafe conditions are recognized, with the exception of minor operational and maintenance items that require attention.▪ Safe performance is expected under all loading conditions including the design earthquake and design flood. |
|--------------|---|



Laguna Hills Local Hazard Mitigation Plan

- Permanent risk reduction measures (reservoir restrictions, spillway modifications, operating procedures, etc.) have been implemented to eliminate identified deficiencies.

Fair

No existing dam safety deficiencies are recognized for normal operating conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency. Risk may be in the range to take further action. Note: Rare or extreme event is defined by the regulatory agency based on their minimum applicable state or federal criteria.

Other Circumstances:

- Lack of maintenance requires attention to prevent developing safety concerns.
- Maintenance conditions may exist that require remedial action greater than routine work and/or secondary studies or investigations.
- Interim or permanent risk reduction measures may be under consideration.

Poor

A dam safety deficiency is recognized for normal operating conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Investigations and studies are necessary.

Other Circumstances:

- Dam has multiple deficiencies or a significant deficiency that requires remedial work.
- Lack of maintenance (erosion, sinkholes, settlement, cracking, unwanted vegetation, animal burrows, inoperable outlet gates) has affected the integrity or the operation of the dam under normal operational conditions and requires remedial action to resolve.
- Critical design information is needed to evaluate the potential performance of the dam. For example, a field observation or a review of the dam's performance history has identified a question that can only be answered by review of the design and construction history for the dam. Uncertainty arises when there is no design and/or construction documentation available for review and additional analysis is needed to better understand the risk associated with operation under normal operational conditions.



Laguna Hills Local Hazard Mitigation Plan

- Interim or permanent risk reduction measures may be under consideration.

Unsatisfactory A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

Typical Circumstances:

- A critical component of the dam has deteriorated to unacceptable condition or failed.
- A safety inspection indicates major structural distress (excessive uncontrolled seepage, cracks, slides, sinkholes, severe deterioration, etc.), advanced deterioration, or operational deficiencies which could lead to failure of the dam or its appurtenant structures under normal operating conditions.
- Reservoir restrictions or other interim risk reduction measures are required.
- A partial or complete reservoir drawdown may be mandated by the state or federal regulatory agency.

Not Rated The dam has not been inspected, is not under state jurisdiction, or has been inspected but, for whatever reason, has not been rated.

LOCATION AND EXTENT

Critical dams and reservoirs within the City of Laguna Hills and surrounding area are listed in Table 4-2, *Dams and Reservoirs*. DSOD's downstream hazard potential and condition assessment for each dam and reservoir are also provided in Table 4-2. Should any of the reservoirs or water tanks fail, persons and property in Laguna Hills could be subjected to inundation, flooding, and/or erosion.



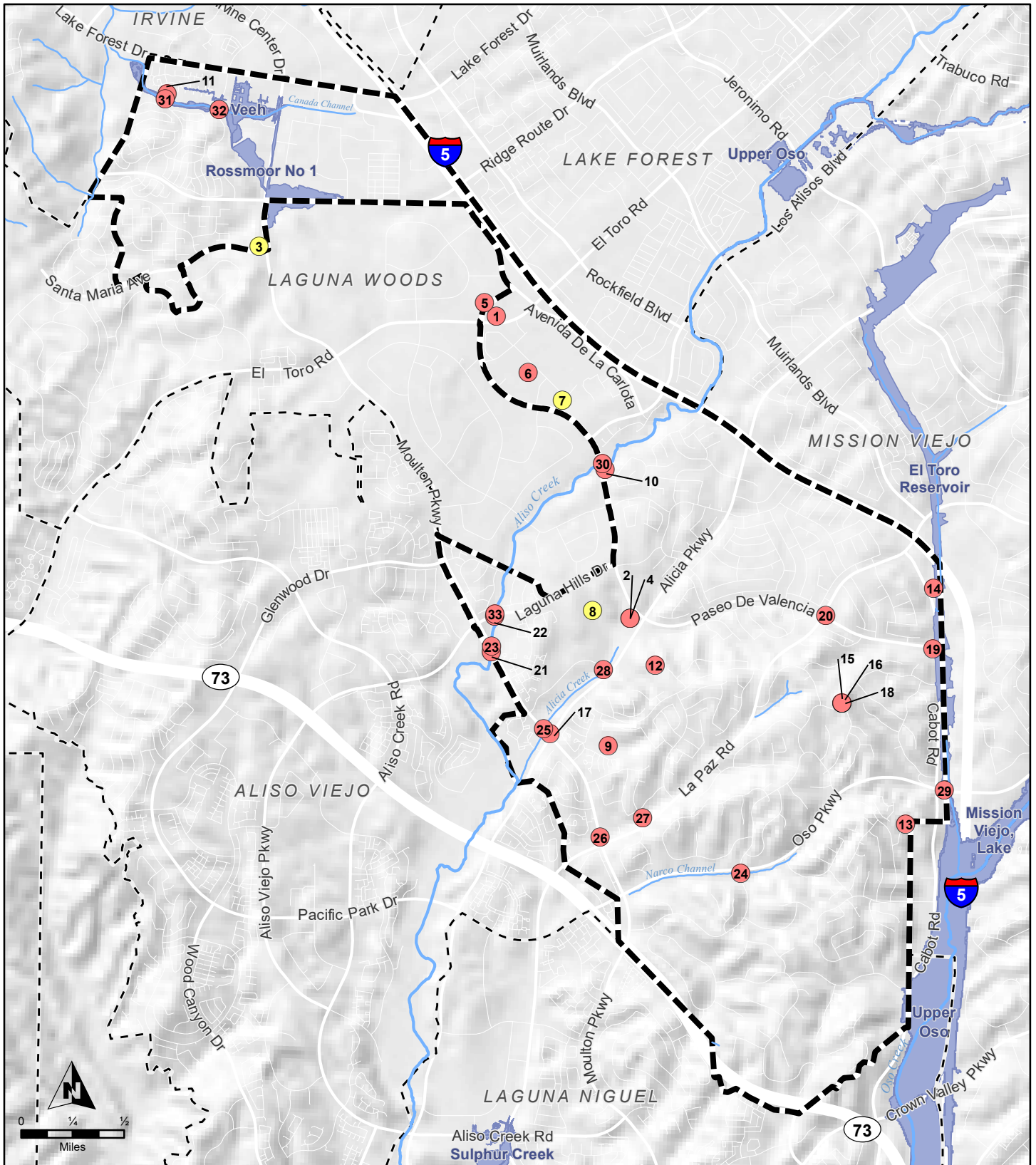
Laguna Hills Local Hazard Mitigation Plan

TABLE 4-2: DAMS AND RESERVOIRS

Name	Type	Jurisdiction; Location	Downstream Hazard Potential	Condition Assessment
Veeh Reservoir	Reservoir	Lake Hills Community Church; Laguna Hills	High	Satisfactory
Rossmoor No. 1	Dam	El Toro Water District; Laguna Woods	High	Satisfactory
Sulphur Creek	Dam	County of Orange; Laguna Niguel	High	Satisfactory
Upper Oso Reservoir	Reservoir	Santa Margarita Water District; County of Orange	Extremely High	Satisfactory
El Toro Reservoir	Reservoir	El Toro Water District; Mission Viejo	Extremely High	Satisfactory
Lake Mission Viejo	Reservoir	Lake Mission Viejo Association, Inc; Mission Viejo	Extremely High	Satisfactory
Upper Chiquita Reservoir	Reservoir	Santa Margarita Water District; Rancho Santa Margarita	Extremely High	Satisfactory
Galivan Retarding Basin	Flood Control	El Toro Water District; Laguna Niguel	Low	Satisfactory

Source: City of Laguna Hills General Plan, Orange County Local Hazard Mitigation Plan, Department of Water Resources Division of Safety of Dams.

The geographic extent from dam or reservoir failure is dependent on the type of infrastructure and amount of water stored at the time of the hazard incident. Development of maps that show inundation areas in the event of dam failure is the responsibility of the dam's owner. Inundation maps have been prepared as part of the EAP effort through DSOD and Cal OES. Small areas of the City are located within dam inundation areas; refer to Figure 4-1, *Dam Inundation Areas*. Inundation areas primarily occur around Veeh Reservoir and Rossmore No. 1 Dam within the northernmost portion of the City, which include, but are not limited to, residential uses. Along the eastern boundary, adjacent to the I-5 freeway, small portions of the City are located within inundation areas associated with El Toro Reservoir, Lake Mission Viejo and the Upper Oso Reservoir. The inundation areas do not contain residential uses. Water from Sulphur Creek Reservoir in Laguna Niguel and Upper Chiquita Reservoir in Rancho Santa Margarita would likely not reach the City.



Legend

- City of Laguna Hills
- Other Incorporated Area
- Dam Inundation Areas
- Critical Facility
- Facility of Concern

**CITY OF LAGUNA HILLS
LOCAL HAZARD MITIGATION PLAN**

Figure 4-1. Dam Inundation Areas



Laguna Hills Local Hazard Mitigation Plan

PREVIOUS OCCURRENCES

Laguna Hills (along with the rest of Orange County cities) has never experienced a major dam failure. The closest dam failures to the City occurred in the City of Los Angeles (St. Francis Dam Disaster of 1928 and Baldwin Hills Dam Disaster of 1963). The City of Westminster in north Orange County experienced a reservoir (tank) failure in 1998 and the Prado Dam experienced minor seepage due to construction activity in 2005. No other incidents have occurred (County of Orange & Orange County Fire Authority, 2021).

PROBABILITY OF FUTURE OCCURRENCES

The primary hazards that could cause failure of the reservoirs and their associated dams are strong earthquake ground shaking, seiche, and liquefaction; however, none of the sites listed in Table 4.2 are in areas associated with known faults or landslides. There has been only one water storage failure in the history of Orange County and no dam or reservoir failures. Over the years, the State of California has implemented stringent standards, regulations, and regular inspections of dam facilities, including after the Oroville Dam crisis in 2017, requiring additional inundation mapping and emergency preparedness planning. The probability of reservoir or dam failure is considered low.

CLIMATE CHANGE CONSIDERATIONS

Dam/reservoir failure is not directly correlated to climate change. Dam and reservoir failure could be caused by seismic activity, which is also not caused by climate change. However, ground failure (due to oversaturated soils) compromising infrastructure integrity or heavy rains overtopping dams could occur. Repetitive severe storm events could increase “wear and tear” and require additional maintenance and infrastructure improvements to protect dam and reservoir integrity and function. Largely, dam and reservoir operations occur outside of climate change and are not directly impacted by climate change conditions.

4.2.2 DROUGHT

DESCRIPTION

Drought in its simplest definition is an extremely dry climatic period where the available water falls below a statistical average for a region. Drought is also defined by factors other than rainfall, including vegetation conditions, agricultural productivity, soil moisture, water levels in reservoirs, and stream flow. Droughts or water shortages are a gradual



Laguna Hills Local Hazard Mitigation Plan

phenomenon, occurring over multiyear periods and increasing with the length of dry conditions. When precipitation is less than normal for a period, the flow of streams and rivers declines, water levels in lakes and reservoirs fall, and the depth to water in wells increases. If dry weather persists and water supply problems develop, the dry period can become a drought. Drought cycles are common in southern California and are influenced by cyclical El Niño and La Niña events.

The term “drought” can have different meanings depending on how a water deficiency affects day to day activities. Drought is a complex natural hazard, which is reflected in the following four definitions commonly used to describe it (NOAH 2021):

- Agricultural – Agricultural drought is defined principally in terms of naturally occurring soil moisture deficiencies relative to water demands of plant life, usually arid crops.
- Hydrological – Hydrological drought is related to the effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
- Meteorological – Meteorological drought is defined solely on the degree of dryness, expressed as a departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
- Socioeconomic – Drought associates the supply and demand of economic goods or services with elements of meteorological, hydrologic, and agricultural drought. Socioeconomic drought occurs when the demand for water exceeds the supply because of weather-related supply shortfall. It may also be called a water management drought.

Although climate is a primary contributor to hydrological drought, other factors such as changes in land use (i.e., deforestation), land degradation, and the construction of dams all affect the hydrological characteristics of a region. Since regions are interconnected by natural systems, the impact of meteorological drought may extend well beyond the borders of the precipitation-deficient area. Changes in land use upstream may alter hydrologic characteristics such as infiltration and runoff rates, resulting in more variable stream flow and a higher incidence of hydrologic drought downstream. Land use change is one way human actions alter the frequency of water shortage even when no change in precipitation has been observed (National Drought Mitigation Center, 2021).

Droughts cause public health and safety impacts, as well as economic and environmental impacts. Public health and safety impacts are primarily associated with catastrophic wildfire risks and drinking water shortage risks for small water systems in rural



Laguna Hills Local Hazard Mitigation Plan

areas and private residential wells. Examples of other impacts include costs to homeowners due to loss of residential landscaping, degradation of urban environments due to loss of landscaping, agricultural land fallowing and associated job loss, degradation of fishery habitat, and tree mortality with damage to forest ecosystems. Drought conditions can also result in damage to older infrastructure that is located within dry soils with potential to leak or break. Dead or dying vegetation poses a risk to falling and damaging structures and infrastructure systems.

In Orange County, drought conditions typically result in implementation of large-scale conservation efforts, reducing water supplies to customers and altering the pricing system by implementing higher rates for water usage that exceeds certain levels (i.e., wasteful). Higher rates that may be imposed during a drought could have disproportionate impacts on lower-income households. Reduction in groundwater supplies during drought conditions can also result in the need for water agencies that have high reliance on local groundwater supplies to purchase larger amounts of imported water. Drought conditions have also resulted in drier brush and an increase in the size and severity of wildfires; refer to the Wildfire Hazard Profile for further discussion.

LOCATION AND EXTENT

Droughts are generally widespread events that could easily affect the entire City of Laguna Hills, and the larger Orange County region. The geographic extent of drought conditions could extend to every resident and business owner receiving water from El Toro Water District (ETWD) and Moulton Niguel Water District (MNWD), the water suppliers for the City. Both ETWD and MNWD rely on imported water from other regions (e.g., Colorado River and northern California) via aqueducts. As a result, droughts can be caused or made worse by conditions in the regions in which the water originates.

Drought severity depends on numerous factors, including duration, intensity, geographic extent, as well as regional water supply demands by humans and vegetation. The severity of drought can be aggravated by other climatic factors, such as prolonged high winds and low relative humidity. The magnitude of drought is usually measured in time and the severity of the hydrologic deficit.

The U.S. Drought Monitor is a map released weekly that indicates the portions of the United States that are experiencing drought and the severity of the drought based on five classifications: abnormally dry (D0), showing areas that may be going into or are coming out of drought, and four levels of drought: moderate (D1), severe (D2), extreme (D3), and exceptional (D4); refer to Table 4.3, *Drought Severity Classification*.



Laguna Hills Local Hazard Mitigation Plan

TABLE 4-3: DROUGHT SEVERITY CLASSIFICATION

Category	Description	Possible Impacts
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits pastures or crops not fully recovered.
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested.
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed.
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions.
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies

Source: U.S. Drought Monitor. (2021). *What is the USDM*. Retrieved November 17, 2021 from <https://droughtmonitor.unl.edu/About/WhatistheUSDM.aspx>.

The Drought Monitor is not a forecast but looks backward; providing a weekly assessment of drought conditions based on how much precipitation did or did not fall. Because drought is a slow-moving hazard, it may take more than one good rainfall to end a drought, especially if an area has been in drought for a long time.

Figure 4-2, *Drought Monitor Map*, depicts the drought monitor map, which identifies areas of drought and labels them by intensity as shown in Table 4-3. As of March 1, 2022, Orange County is classified as "Moderate Drought" by the U.S. Drought Monitor.



Laguna Hills Local Hazard Mitigation Plan

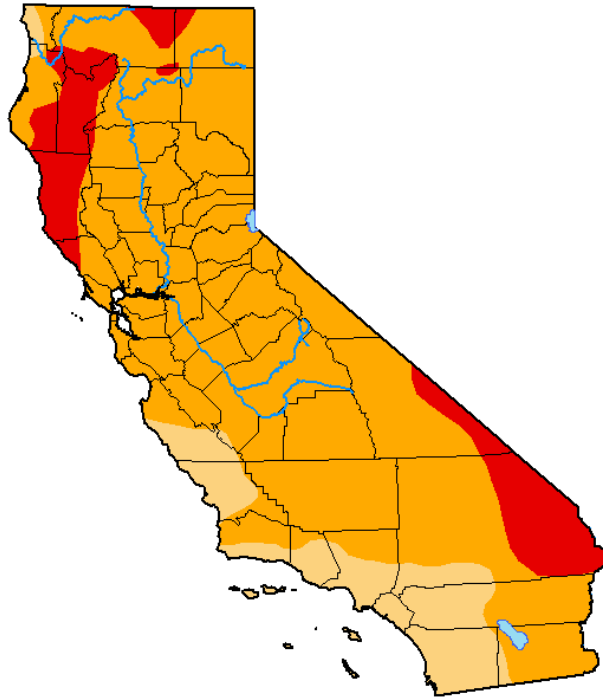
FIGURE 4-2 – DROUGHT MONITOR MAP

U.S. Drought Monitor California

March 1, 2022

(Released Thursday, Mar. 3, 2022)

Valid 7 a.m. EST



Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

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droughtmonitor.unl.edu

Source: U.S. Drought Monitor. (2022). California. Retrieved March 3, 2022 from <https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?CA>.

PREVIOUS OCCURRENCES

Although defining drought can be challenging across a large geography, California has experienced numerous severe droughts over the past century. FEMA declared one drought emergency for California in January 1977, and other drought emergency declarations have been declared by the State. According to the 2018 State Hazard Mitigation Plan, from 1972 to 2016, there were fifteen drought State Emergency Proclamations in California (OES, 2018).



Laguna Hills Local Hazard Mitigation Plan

Table 4-4, *Historical Droughts*, shows the historical droughts that have occurred in California from 1827 through the present.

TABLE 4-4: HISTORICAL DROUGHTS

Date	Area Affected	Notes
1827-1916	Statewide	Multiyear: 1827–29, 1843–44, 1856–57, 1863–64 (particularly extreme), 1887–88, 1897–1900, 1912–13.
1917-21	Statewide except central Sierra Nevada and north coast	Simultaneous in affected areas, 1919–20. Most extreme in north.
1922–26	Statewide except central Sierra Nevada	Simultaneous in effect for entire State only during 1924, which was particularly severe.
1928-37	Statewide	Simultaneously in effect for entire State, 1929–34. Longest, most severe in State's history.
1943–51	Statewide	Simultaneously in effect for entire State, 1947–49. Most extreme in south.
1959–62	Statewide	Most extreme in Sierra Nevada and central coast.
1976–77	Statewide, except for southwestern deserts	Driest 2 years in State's history. Most severe in northern two-thirds of State.
1987–92	Statewide	Moderate, continuing through 1989. Most extreme in northern Sierra Nevada.
2000-2002	Statewide	Most severe in southern California.
2007-2009	Statewide	Twelfth driest 3-year period on record at the time. Most severe in western San Joaquin Valley.
2012-17	Statewide	Most severe California drought on record.
2021- Current	Statewide	Drought emergency proclamation issued in April 2021 with additional orders May 2021, July 2021, October 2021 and October 2022.

Source: Paulson, Chase, Roberts, and Moody, 1991; California Department of Water Resources, 2020; State of California, 2022.

The most severe drought on record began in 2012 and continued through 2017. On January 17, 2014, the governor of California declared a State drought emergency, and on April 1, 2014 the governor announced the first-ever mandatory 25 percent statewide water use reduction and a series of actions to help save water, increase enforcement to prevent wasteful water use, streamline the State's drought response, and invest in new technologies that would make California more drought resilient. At the time of the announcement, the volume of snowpack in California's mountains was approximately 20 percent of normal. Despite multiple storms in February 2014, drought conditions persisted. By the end of May 2014, all of California was in a condition of "extreme" or "exceptional" drought. At the same time, the volume of snowpack had decreased to less than 10 percent of normal and water stored in Statewide Reservoirs was at 56 percent of normal (California Department of Water Resources, 2020). On April 7, 2017, the



Laguna Hills Local Hazard Mitigation Plan

governor issued an executive order ending the drought emergency in Southern California, including Orange County.

On October 19, 2021, the governor of California declared a State drought emergency, which added the eight counties, including Orange County (not included within an executive order in July 2021) calling for a voluntary reduction of water use by 15 percent across California (California Governor's Office, 2021). This declaration followed the second driest year on record and near record low storage in California's largest reservoirs. The proclamation requires local water suppliers to implement water shortage contingency plans that are responsive to local conditions and prepare for the possibility of a third dry year. On March 28, 2022, the governor issued an executive order noting continued drought conditions and requiring urban water suppliers to activate, at a minimum, Level 2 of their customized Water Shortage Contingency Plans. These plans, required by State law, are developed by local water agencies to navigate drought and each plan is customized based on an agency's unique infrastructure and management. Triggering Level 2 of these plans involves implementing water conservation actions to prepare for a water shortage level of up to 20 percent. For example, in many communities, this would mean reducing the number of days that residents can water outdoors, among other measures.

During drought conditions, the City partners with ETWD and MNWD to educate residents and business owners regarding State-mandated water conservation measures. The goal of the ETWD water conservation program is to educate the general public within its service area through the promotion of water awareness, and encouraging where feasible, water conserving measures with an emphasis on conservation in landscape applications and other uses around the exteriors of commercial/industrial buildings and residences (El Toro Water District, 2022). To accomplish this, ETWD has adopted Best Management Practices (BMP's) for urban water conservation. MNWD similarly provides water efficiency programs and resources, including education programs, landscape and irrigation workshops, water saving tips, and a fix-a-leak guide (Moulton Niguel Water District, 2022). Chapters 9-46 and 9-47 of the City's Zoning Code includes landscape water use standards, guidelines, and calculations to promote conservation and efficient use of water in the City.

PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences and trends in California, as well as current conditions, the likelihood that Laguna Hills will experience drought conditions in the future is considered high. The U.S. Seasonal Drought Outlook depicts large-scale trends based on U.S. Drought



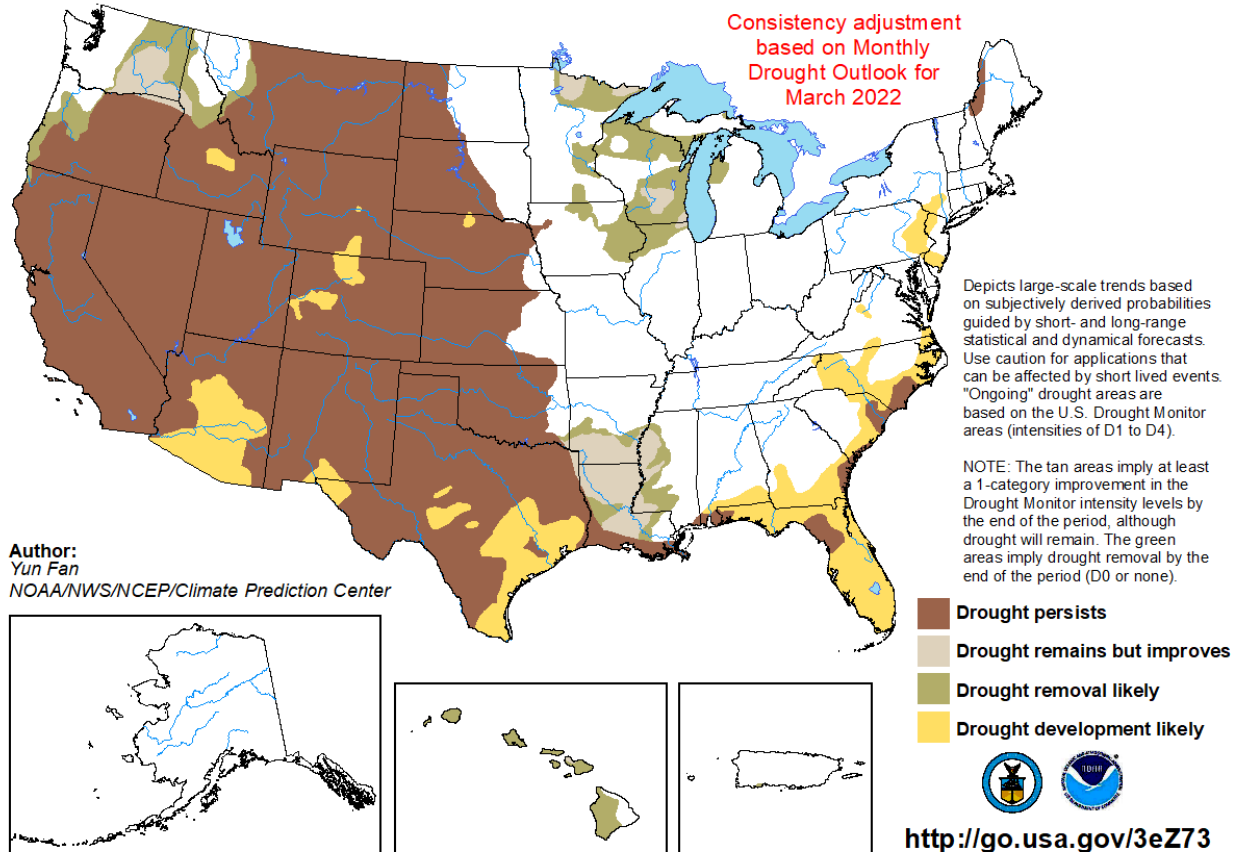
Laguna Hills Local Hazard Mitigation Plan

Monitor areas (intensities of D1 to D4), as shown in Figure 4-3, *U.S. Seasonal Drought Outlook*. The southern California region, including Laguna Hills, is currently showing persistent drought and is considered to have a high probability for reoccurrence within the City.

FIGURE 4-3: U.S. SEASONAL DROUGHT OUTLOOK

U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid for March 1 - May 31, 2022
Released February 28, 2022



Source: National Weather Service Climate Prediction Center. (2022, February). U.S. Seasonal Drought Outlook. Retrieved March 3, 2022 from https://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.png.

CLIMATE CHANGE CONSIDERATIONS

Governor Brown's 2014 drought emergency declaration noted that droughts could occur more regularly into the future. Additionally, Governor Newsom's 2022 executive order notes that climate change continues to intensify the impacts of droughts and California is in a third year of dry conditions. The experiences faced by water supply



Laguna Hills Local Hazard Mitigation Plan

agencies during the recent and current droughts have prompted actions to examine water storage, distribution, management, conservation, and use policies more closely. Water districts drafted administrative drought actions and implemented mechanisms allowing for administrative consistency and coordination to address drought conditions statewide.

According to the 2018 State Hazard Mitigation Plan, climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the twenty-first Century due to climate change, such as more frequent and extended periods of high temperature conditions. Decreasing snowmelt, reduced precipitation, and higher temperatures are all expected effects of climate change. The *California Adaptation Planning Guide* states that the pressure climate change places on ground water reliance during times of drought is not sustainable. The *Fourth Climate Change Assessment* states that California has experienced a succession of dry spells, and with warmer conditions the impacts of these droughts have increased. Additionally, the 2012-2016 drought followed by a very wet winter in 2016-2017 followed by current drought conditions, is further indication of potential continued climate volatility. Increasing populations and increasing demand for water in southern portions of California are anticipated to continue and may result in future challenges associated with drought conditions and climate change for Laguna Hills and other communities.

4.2.3 FLOOD

DESCRIPTION

Flooding occurs when a waterway, either a natural one or an artificial drainage channel, receives more water than it is capable of conveying, causing the water level in the waterway to rise. Depending on how long these conditions last and the amount of water the waterway receives in proportion to its capacity, the rising water level may eventually overtop the waterway's banks or any other boundaries to the drainage area, resulting in flooding in the surrounding area.

Floods often occur during heavy precipitation events, when the amount of rainwater exceeds the capacity of storm drains or flood control channels. Floods can also happen when infrastructure such as levees, dams, or culverts fail, or when a section of drainage infrastructure fails, and water cannot be drained from an area fast enough. These failures can be linked to precipitation events (i.e., when water erodes away a levee, allowing water to escape and flood nearby areas), or can be a consequence of other emergency situations (i.e., a dam collapsing due to an earthquake).



Laguna Hills Local Hazard Mitigation Plan

FEMA defines flood or flooding as a general and temporary condition of partial or complete inundation of normally dry land areas from:

- The overflow of inland or tidal waters;
- The unusual and rapid accumulation or runoff of surface waters from any source; or,
- Mudslides (i.e., mudflows) which are proximately caused by flooding and are akin to a river of liquid and flowing mud on the surfaces of normally dry land areas, as when earth is carried by a current of water and deposited along the path of the current.

Floods can be caused by a number of factors, including:

- Weather and climate patterns (e.g., El Niño, La Niña, Pineapple Express, Atmospheric River, etc.)
 - El Niño and La Niña are complex weather patterns resulting from variations in ocean temperatures in the equatorial Pacific. Warmer or colder than average ocean temperatures in one part of the world can influence weather around the globe. El Niño and La Niña episodes typically last 9 to 12 months, but some prolonged events may last for years (NOAA, 2021a).
 - Pineapple Express is a name given to an atmospheric river on the West Coast. It is a channel in the atmosphere that moves vast amounts of moisture and can result in massive showers.
- Hydrologic features such as reservoirs, ponds, lakes, rivers, etc. can have a large impact on the amount of flooding.
- The absorption capacity of the ground depends on the composition of soil and bedrock of the area. Less absorbent soil conditions in addition to lack of proper storm infrastructure can result in flooding.
- Type and density of vegetation is related to absorption of moisture affecting the flow of water.
- Patterns of land use/urbanization relates to the pervious and impervious nature of the ground.
- Expected level, age, and condition of flood management infrastructure will impact flooding conditions.



Laguna Hills Local Hazard Mitigation Plan

- Large-scale wildfires dramatically alter the terrain and ground conditions. Vegetation absorbs rainfall, reducing runoff. However, wildfires leave the ground charred, barren, and unable to absorb water, creating conditions ripe for flash flooding and mudflow. Flood risk remains significantly higher until vegetation is restored – up to 5 years after a wildfire (FEMA, 2020).

The force of a flood can be enough to carry away large objects and damage structures, causing considerable damage to buildings and infrastructure. In severe instances, floodwaters themselves can destroy structures or move them off their foundation. Floods can saturate and weaken soil, potentially making structures built on them more susceptible to damage or collapse. Flooding can affect water quality, as large volumes of water can transport contaminants into water bodies and overload storm and wastewater systems. Additionally, large increases in water volume can cause water body erosion and loss of aquatic habitat. It can also cause great economic loss to people and government due to the destruction of roads, bridges, farms, businesses, houses, and automobiles.

LOCATION AND EXTENT

Floods have the potential to cause extensive property damage and injury to the community. Orange County's terrain makes it naturally susceptible to flooding. Many of the rivers, creeks, and streams flow through natural floodplains on their way to the ocean. The Aliso Creek runs through the middle of the City in a southwesterly direction. The majority of the City lies within the Aliso Creek Watershed, which drains to Aliso Creek; a small portion of the southern part of the City is in the San Juan Creek Watershed, which flows to San Juan Creek; and a small portion in the northern part of the City is in the San Diego Creek Watershed, which drains to San Diego Creek (City of Laguna Hills, 2009). The City is responsible for storm drain systems within City boundaries, while the Orange County Flood Control District (OCFCD) is the agency responsible for regional flood control.

Some areas of Laguna Hills are determined to be within a FEMA-designated flood zone. Flood zones within Laguna Hills are determined by Flood Insurance Rate Maps (FIRMs), produced by FEMA in partnership with various communities. A FIRM is the official flood map that shows a community's flood hazard areas. These may include high-hazard (Special Flood Hazard Areas [SFHA]), moderate- to low-hazard areas, and undetermined areas. A SFHA map shows the 100-year floodplain, divided into zones A and AE. A FIRM also includes 500-year floodplains and higher, classified as moderate and minimal risk areas (FEMA, 2021). The extent or magnitude of flooding is measured by percentage and annual chance floods. A 100- and 500-year flood is an event that has a 1 in 100 (1 percent) and 1 in 500 (0.2 percent) chance, respectively, of occurring in any given year.



Laguna Hills Local Hazard Mitigation Plan

This data is incorporated into FIRMs to support the National Flood Insurance Program (NFIP) and provide the basis for community floodplain management regulations and flood insurance requirements.

A regulatory floodway is a subset of the 100-year floodplain and is defined by FEMA as the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Communities must regulate development in these floodways to ensure that there are no increases in flood elevations.

Figure 4-4, *FEMA Flood Zones*, shows the locations of flood zones in Laguna Hills, and Table 4-5, *Acreage by FEMA Flood Zones*, provides the details and acreage of these zones that occur within the City. Within the Laguna Hills area, potential flooding could occur along Aliso Creek, Veeh Reservoir, Mill Creek, and in an area northwest of Alicia Parkway in the southern portion of the City.

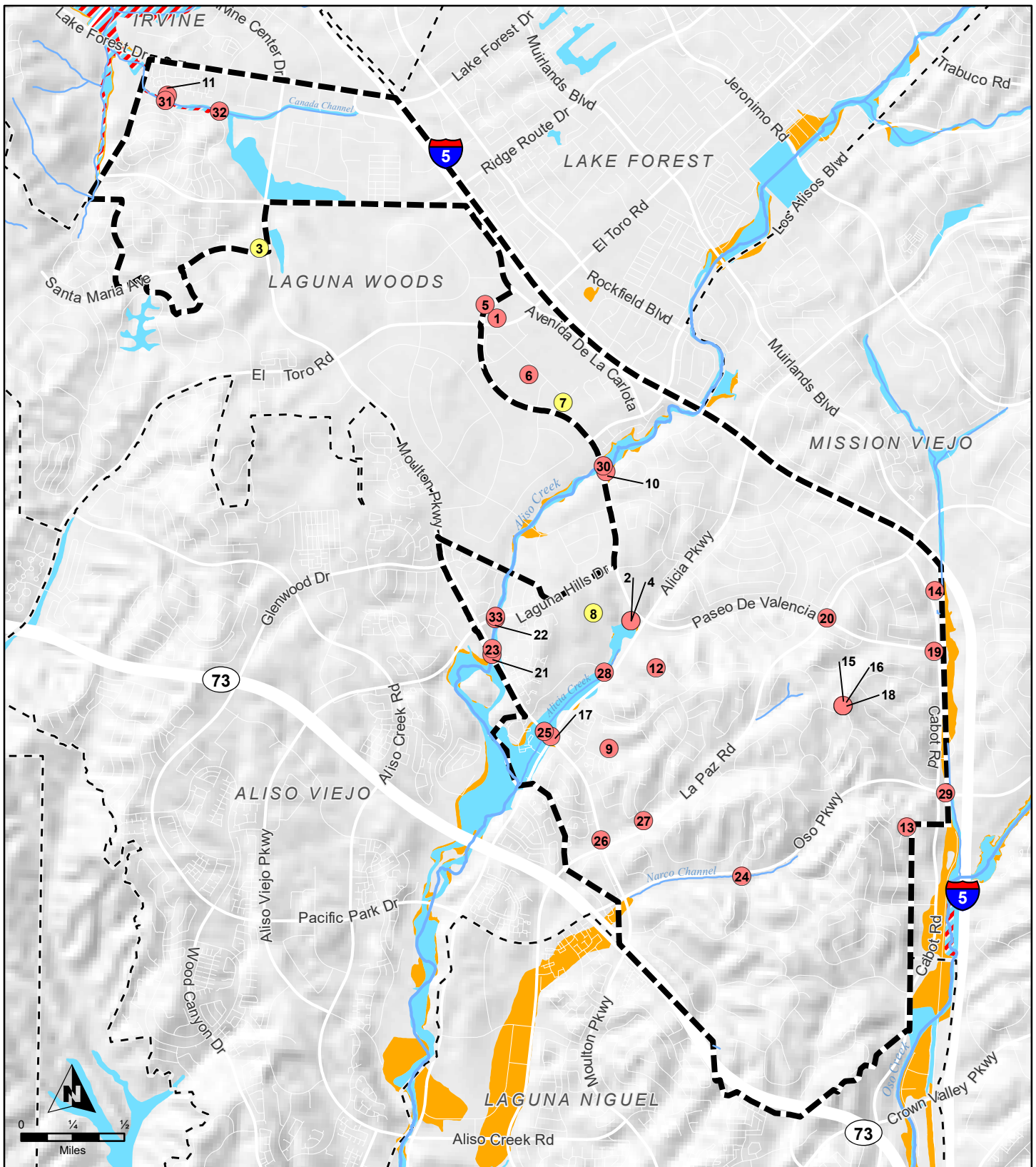
TABLE 4-5: ACREAGE BY FEMA FLOOD ZONES

Flood	Risk	Area (Acres)
100-Year Flood	High	127.37
Regulatory Floodway	High	4.30
500-Year Flood	Moderate to Minimal	15.27

Source: FEMA, December 8, 2021.

Flooding can also occur outside of mapped flood hazard zones during heavy rain events associated with extensive runoff. Localized flooding typically occurs when significant amounts of rain fall over a short time period and/or, as a result of overloaded or blocked stormwater drainage systems that cause sheet flow into streets and low-lying areas. Within Laguna Hills, these localized events typically occur in areas where a secondary outlet does not exist and have caused localized damage. The City has identified these locations and has plans for repairs. The City also maintains a list of drain locations susceptible to blockage from debris flows during heavy rain events to address potential flooding. Areas of localized flooding include:

- Canada Channel (F-23), discussed further below.
- El Toro Road – Avenida de la Carlota secondary outlet (past Plaza Lane)
- Beckenham Street down drain
- Largo Drive – 60 inch inlet (behind Ralph's Grocery Store)



Legend

- City of Laguna Hills
- Other Incorporated Area
- 100-Year Flood Zone
- Regulatory Floodway
- 500-Year Flood Zone
- Area of Minimal Flood Hazard

- Critical Facility
- Facility of Concern

CITY OF LAGUNA HILLS LOCAL HAZARD MITIGATION PLAN

Figure 4-4. FEMA Flood Zones



Laguna Hills Local Hazard Mitigation Plan

In other areas within or near the City where localized flooding tends to occur, the storm drain infrastructure is the responsibility of another agency, such as the County. In the area of Canada Channel (F-23) at Del Lago Drive and Moulton Parkway, the roadways have experienced flooding resulting in vehicles being stranded during heavy rain events. During a significant storm event, water from the I-5 Freeway at the El Toro Road underpass has also resulted in flooding of the roadway and stranded vehicles. The City regularly works with partner agencies to identify these situations and locations in order for the situation to be remedied during future events. Overall, localized flooding events are typically rare and have not caused extensive damage.

PREVIOUS OCCURRENCES

The National Weather Service report, *A History of Significant Weather Events in Southern California*, includes a chronological list of events organized by weather type. However, only one of these events have affected Laguna Hills. Additionally, the National Oceanic and Atmospheric Administration (NOAA) Storm Event Database summarizes flood events of regional significance affecting the City of Laguna Hills. These are documented below:

- In December 1997, an El Niño storm brought the heaviest rain to Orange County in 70 years; the neighboring city, Mission Viejo, totaled as much as 10 inches in heavy downpours. Widespread flooding and mudslides occurred throughout the County.
- In February 2003, Aliso Creek flooded Pacific Coast Highway at its crossing in Laguna Beach.
- In December 2010-January 2011, California received a Presidential Declaration for the Severe Winter Storms, Flooding, and Debris and Mud Flows that occurred over a nearly three-week period. During this incident, the State of California incurred well over \$75 million in damages, of which over \$36 million occurred within Orange County due to the 10 inches or more of rain received. Much of the damage impacted private and public property, as well as critical infrastructure.
- In February 2014, the only significant storm of the 2013-2014 rainy season caused minor street flooding in neighboring city, Mission Viejo. Weather stations reported that more than an inch of rain had fallen in a span of three hours in northern Orange County.
- In July-August 2015, moisture from Hurricane Dolores and Hurricane Linda resulted in uncharacteristic showers and thunderstorms with up to 4 inches of rain in southern California.



Laguna Hills Local Hazard Mitigation Plan

- In September 2015, flooding of roadways caused severe traffic congestion across southern California, including Orange County. In the City of Los Angeles, 7,300 people lost power for most of the day, and there more than 500 traffic collisions across the entire region as a result of the road conditions.
- In 2017 Winter Storms included three storms over six days inundating southern California. Heavy rains, combined with already saturated soil, produced flash flooding across much of Orange County. Streets flooded with 1 to 3 feet of water in Huntington Beach, Santa Ana, and Newport Beach. The storms resulted in a Presidential Disaster Declaration for 16 counties throughout the state.
- In February 2019 a significant storm result in channel lining failures in Laguna Beach alongside Laguna Canyon Road and San Juan Capistrano alongside Trabuco Creek Road.

While many flood events have occurred within southern Orange County, no major floods have historically caused major damage within the City of Laguna Hills.

PROBABILITY OF FUTURE OCCURRENCES

Flooding (i.e., inundation) as a result of reservoir or dam failure is addressed in Section 4.2.1. This section addresses flooding resulting from heavy precipitation events. For areas located within the 100-year flood zone, there is a one percent chance in a given year that this area will be inundated by flood waters. For moderate flood hazard areas located within the 500-year flood zone, the probability decreases to 0.2 percent chance in a given year that the area will be inundated by flood water. Flooding incidents are most likely to occur within FEMA delineated flood zones.

Additional zones in the periphery of these flood areas may pose a flood risk, but since they are outside the designated 1-percent annual chance floodplain, they do not require additional flood insurance. Lower risk areas are also located along the La Paz Channel on the eastern border of Laguna Hills, and along North Sulfur Creek around Moulton Parkway. The County of Orange and the City maintain an extensive storm drain system that would normally divert any excessive rainfall into appropriate channels. However, a significant rain event could cause flooding in the zones, or minor, localized flooding elsewhere in the City.

CLIMATE CHANGE CONSIDERATIONS

Climate change is expected to influence the frequency and intensity of precipitation events throughout California and could have a direct effect on flooding. According to



Laguna Hills Local Hazard Mitigation Plan

research conducted by UCLA, California will experience extremely wet and extremely dry seasons by the end of the century. It is predicted that “over the next 40 years, the State will be 300 to 400 percent more likely to have a prolonged storm sequence as severe as the one that caused the legendary California flood more than 150 years ago” (UCLA, 2018). The *Fourth Climate Change Assessment* indicates the intensity of heavy precipitation events is increasing and identifies a medium-high confidence for future change. While the annual rainfall averages may remain constant, the wet season may be narrower, leading to large downpours in a short period of time that overwhelm infrastructure and lead to increased flooding. With population density and increased urbanization of Orange County, increased precipitation events and associated flooding could be devastating.

4.2.4 HUMAN-INDUCED HAZARDS

The following human-induced hazards are analyzed below: hazardous spills/release and cyber threat.

DESCRIPTION

Hazardous Spills/Release

A hazardous material is defined as any injurious substance, including pesticides, herbicides, toxic metal and chemicals, explosives, and nuclear fuels and materials. The term “release” means spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment, unless permitted or authorized by a regulatory agency (Health and Safety Code Division 20, Chapter 6.95 Hazardous Materials Release Response Plans and Inventory, Article 1). The use of these hazardous materials is common in commercial, industrial, and manufacturing activities. Because these materials are increasingly used in urban settings, there are activities within the City that expose residents to certain risks associated with hazardous materials. The use of combustibles, and the use, transport, and disposal of hazardous and toxic wastes pose certain risks to the general population of the City. Hazardous materials accidents can occur during production, storage, transportation, use, or disposal (United States Department of Homeland Security, 2021).

The impacts of hazardous material release vary, depending on the type and amount of material released. Hazardous materials exposure can include the following effects: skin/eye irritation; difficulty breathing; headaches; nausea; behavior abnormalities; cancer; genetic mutations; physiological malfunctions (i.e., reproductive impairment,



Laguna Hills Local Hazard Mitigation Plan

kidney failure); physical deformations; or, birth defects (United States Environmental Protection Agency, 2022).

Cyber Threat

A cyber threat is when an individual or group threatens or attempts to target an enterprise's use of cyberspace for the purpose of disrupting, disabling, destroying, or maliciously controlling a computing environment/infrastructure; or destroying the integrity of the data or stealing controlled information (United States Department of Commerce, 2022). The U.S. Department of Homeland Security categorizes cyber incidents under two categories: data breach, in which a person, organization, or agency gains unauthorized or illegal access to personal, sensitive, or confidential information; and physical infrastructure failure, which would include the disabling of multiple essential functions of physical and virtual assets, systems, and networks, and could result in restricted access to energy, food, clean water, and other emergency services (United States Department of Homeland Security, 2022). A common example of the former includes ransomware, which is designed to encrypt files on a device, rendering any files and the systems that rely on them unusable. Malicious actors then demand ransom in exchange for decryption.

LOCATION AND EXTENT

Hazardous Spills/Release

The use of combustibles, and the use, transport, and disposal of hazardous and toxic wastes pose certain risks to the general population of the City. As discussed in the General Plan Safety Element, I-5 and SR-73 are major transportation arterials that border Laguna Hills and it is likely that hazardous materials are transported along these roadways, thus potentially exposing people to potential catastrophic events. Additionally, all arterial highways within the City are designated truck routes with the potential to transport hazardous materials. Hazardous materials require special methods of disposal, storage, and treatment, and the release of hazardous materials requires an immediate response to protect human health and safety and/or the environment.

Although there are no businesses that generate significant hazardous materials within the City, there are businesses that handle, store, or generate hazardous materials in the operations of their business. Common hazardous materials include diesel fuel, chlorine, flammable waste, fuel waste, radiator coolant, ethylene glycol, pesticides, paint thinner, non-halogenated solvents, slop oil, toxics, and petroleum distillate solvents. The City maintains permitting requirements that parallel County requirements for businesses within Laguna Hills that handle, store, or generate hazardous waste. In addition, common



Laguna Hills Local Hazard Mitigation Plan

household items, such as medical waste (syringes), latex and oil-based paints, antifreeze, batteries, used motor oil, fertilizers, pesticides, herbicides, and electronic waste, such as used cell phones and computers, are considered hazardous waste, and cannot be disposed of along with other residential trash.

There are 21 locations with a Laguna Hills address that are listed in the State Water Resources Control Board GeoTracker database for Leaking Underground Storage Tanks (LUST). Table 4-6, *Leaking Underground Storage Tank Sites*, lists LUST sites in Laguna Hills according to the GeoTracker. Of these 21 LUST sites, the status of one site is “open – remediation” as of June 18, 2007: Wright Petroleum (Aka G&M Oil Company Station #40) located at 23991 El Toro Road. The potential contaminant of concern at the open site is diesel. All other LUST sites within Laguna Hills have a status of “completed – case closed.”

TABLE 4-6: LEAKING UNDERGROUND STORAGE TANK SITES

Site Name	Status
Arco #3079	Completed - Case Closed
Briggs Investment Properties	Completed - Case Closed
Chevron (24081 El Toro)	Completed - Case Closed
Chevron (25172 Cabot)	Completed - Case Closed
David J Phillips Auto Center	Completed - Case Closed
David J Phillips Buick	Completed - Case Closed
Dunn Edwards Paint	Completed - Case Closed
La Paz Professional Building	Completed - Case Closed
Laguna Hills Car Wash	Completed - Case Closed
Leisure World	Completed - Case Closed
Mathis Reservoir	Completed - Case Closed
Mobil #18-826	Completed - Case Closed
Moulton Niguel Water District	Completed - Case Closed
Orange County Fire Station #22	Completed - Case Closed
Rossmoor Property	Completed - Case Closed
Shell (23971 El Toro)	Completed - Case Closed
Shell (23038 Lake Forest)	Completed - Case Closed
Tosco - 76 #5646	Completed - Case Closed
Unocal	Completed - Case Closed
Unocal #5647	Completed - Case Closed
Wright Petroleum (Aka G&M Oil Company Station #40)	Open - Remediation

Source: California State Water Resources Control Board, 2022.

The San Onofre Nuclear Generating Station (SONGS) is located in San Diego County approximately 15 miles south of Laguna Hills within the Camp Pendleton military reserve. The U.S. Nuclear Regulatory Commission has identified the area surrounding SONGS, and every nuclear power facility, as an Emergency Planning Zone, and the State of California has defined the area outside and adjacent to the Emergency Planning Zone as a Public



Laguna Hills Local Hazard Mitigation Plan

Education Zone. Laguna Hills is located outside of the Emergency Planning Zone but lies within the Public Education Zone. For areas within this zone, the State of California and Southern California Edison have created education programs to ensure that residents are prepared for any potential problems associated with the facility.

Radioactive by-products are primarily contained within the plant; however, small quantities of radioactive gas are released into the air and liquids into the Pacific Ocean. The releases are monitored by SONGS personnel; according to SONGS, radiation exposure due to material release is less than typical exposure from natural background radiation. The two most likely sources of radiation contamination are transportation accidents involving the transport of radioactive materials and uncontrolled releases at the plant site.

SONGS was granted Permanently Defueled Status in 2015 and is in the process of being decommissioned and dismantled. Dismantlement of the facility began in 2020 and decommissioning activities are anticipated to be completed by 2045. While the decommissioning process is regulated by the Nuclear Regulatory Commission (NRC), spent radioactive material continues to be stored onsite and the potential for accidental release is possible. Continued safety and emergency response policies and protocols are still needed until SONGS is fully decommissioned and the land returned to the U.S. Navy.

The extent of a hazardous materials release is dependent on several conditions, including the nature of the material, climate conditions, the amount of chemical released, and the regulatory environment. The extent of the release can also depend on intent (non-malicious or malicious). Non-malicious releases would be accidental releases because of human error, technological failure, or natural hazards.

The nature of the released material is usually the most important determinant of the extent or severity of a spill. Hazardous materials can be flammable, radioactive, infectious, corrosive, toxic/poisonous, or otherwise reactive. For example, a radioactive material spill would have much further-reaching extent when compared to a paint spill. Climate conditions also affect the severity of hazardous materials spills. For example, heavy rains or winds can spread hazardous materials over a larger geographical area and cause challenging cleanup conditions. In severe situations, the City may be at risk of hazardous materials release events on a regional level. With the right prevailing wind conditions, airborne toxic material could spread to and impact various parts of the air basin, including areas of Laguna Hills. Challenging cleanup conditions could allow for further contaminations due to the spill. Additionally, natural hazards such as wildfires or



Laguna Hills Local Hazard Mitigation Plan

earthquakes could cause hazardous materials releases as a secondary effect with challenging cleanup conditions.

Cyber Threat

Cyber threats and potential attacks occur in cyberspace and could therefore affect any device or infrastructure network connected by digital technology. The impact of a cyber threat or attack is highly variable. The size and severity of the attack depends on who or what is targeted and can affect a range from one person to the entire City and/or region, and from hundreds to millions of dollars in damages. A minor threat could simply cause computer systems to slow down for a few minutes and not behave as responsively. However, a major cyber threat could cause a complete shutdown of critical systems, including those used by banks, healthcare institutions, universities, major businesses, and city government.

Cyber threats are not measured in any scale; however *Cyber Threat Metrics* (Sandia National Laboratories, 2012) provides a description of some categories of incident information that may be used to assess and measure the attributes of a threat:

- The type of incident (website defacement, denial of service, unauthorized surveillance).
- The use of malicious software and its purpose.
- The level of security protection on the target system.
- The duration of the cyber threat (a few hours, a few days, several weeks, etc.).

The magnitude of a threat's attributes must often be estimated using some indirect method, such as statistical data analysis, expert opinion, or intelligence analysis.

PREVIOUS OCCURRENCES

Hazardous Spills/Release

The Comprehensive Environmental Response, Compensations, and Liability Act (CERCLA), Emergency Planning and Community Right-to-Know Act (EPCRA), and California law require responsible parties to report hazardous materials releases if certain criteria are met. Recent spills in the City are identified in Table 4-7, *Cal OES Historical HazMat Spill Notifications in Laguna Hills since 2010*.



Laguna Hills Local Hazard Mitigation Plan

TABLE 4-7: CAL OES HISTORICAL HAZMAT SPILL NOTIFICATIONS IN LAGUNA HILLS SINCE 2010

Spill Date	Agency	Site	Spill Substance Type	Amount (gallons)*
01/24/10	Laguna Hills	1189 Temple Hills Drive	Sewage	10
02/20/12	El Toro Water District	22045 Caminito Amor	Sewage	3,600
04/03/13	SoCal Edison	160 Majorca	Petroleum	<1
09/25/13	CHP Orange County	I-5 N/B (El Toro Road)	Petroleum	60
10/05/13	El Toro Water District	Ridge Route & Peralta	Sewage	600
04/28/14	Orange County Public Works	La Paz Road/Moulton Parkway	Sewage	10,000
06/29/15	El Toro Water District	22902 Avenida Valverde	Sewage	5
07/01/15	El Toro Water District	23875 Willows Drive	Other	6,050
12/18/15	El Toro Water District	23101 Moulton Pkwy/Granite	Sewage	15
12/20/15	SoCal Edison	566 Avenida Majorca Wy	Petroleum	30
08/06/16	El Toro Water District	22701 Granite Way	Sewage	12,111
2/13/17	San Diego Gas and Electric	Alicia Parkway/Aliso Hills Drive	Petroleum	30
3/9/17	SoCal Gas	24301 Avenida de la Carlota	Vapor	Unknown
4/29/18	Public Storage	25131 Costeau Street	Other	Unknown
8/12/18	Private Citizen	25261 Champlain Road	Other	25
9/10/18	Maurer Technical Services	23331 Peralta Drive	Radiological	10 Millicuries
11/28/19	El Toro Water District	Los Adornos	Sewage	5
3/9/20	South Orange County Waste Water Authority	252001 La Paz Road	Other	24,000
3/20/20	SoCal Edison	Bahia Blanca West & Calle Azul	Vapor	10 Pounds
5/12/20	Wetlands and Wildlife Care Center	23001 Del Lago Drive	Unspecified	Unknown
6/28/20	Southern California Gas	25582 Macenzie Street	Vapor	Unknown
4/10/21	Moulton Niguel Water District	Pacific Park & Mareblu	Other	50,000
12/15/21	NRC	25322 Las Bolsas	Petroleum	Unknown

Source: California Governor's Office of Emergency Services, 2022.

* measured in gallons unless otherwise stated.

Cyber Threat

The City has not experienced a cyberthreat or activity that has caused disruption.

PROBABILITY OF FUTURE OCCURRENCES

Hazardous Spills/Release

Laguna Hills has experienced hazardous releases historically, and includes facilities that use, transport, and dispose of hazardous materials. Typically, these events have been the result of human error, malfunctioning equipment, or compromised infrastructure and



Laguna Hills Local Hazard Mitigation Plan

have not resulted in significant damage or human health hazards. Based on this and the City's location in proximity to major transportation routes, it is likely that some amount of hazardous spills/release will continue to occur within the City and has been identified as having a medium probability.

The Safety and Environmental Services Section (SESS) of OCFA is responsible for gathering and maintaining inventories of chemicals stored, handled, and used within Laguna Hills. Once identified, SESS is responsible for compiling this information into a database, which can be accessed through the Community's Right to Know program. This program responds to all requests from the public for hazardous materials information and disclosure. In addition, OCFA has developed a Hazardous Materials Area Plan addressing day-to-day hazardous material operations as well as extreme emergencies. The role of Laguna Hills in the event of a hazardous materials emergency is focused on discovery, notification evaluation, and initiation of immediate on-scene action. The City will continue to maintain permitting requirements that parallel County requirements for businesses within Laguna Hills that handle, store, or generate hazardous waste.

Cyber Threat

Cyber threats in general have been increasing due to the integrated nature of technology and its everyday use in the operations of business activities. No cyber threats or attacks are known to have disrupted the City's normal operations and the probability of the City experiencing a cyber threat that causes major disruption is considered low. The City utilizes anti-malware software and maintains off-site backup systems. Further, public safety for the City is provided by third-party independent agencies. However, it is noted that this continues to be an area to monitor and the City will continue to implement systems to decrease the potential for cyber-attacks and disruptions to its operations.

Due to the integrated nature of technology into the everyday lives of Irvine's residents, businesses, and government operations, it is possible that a cyber threat could emerge in the future. While no cyber threats are publicly known to have disrupted the City's normal operations in the past, the likelihood of a cyber threat affecting the residents, businesses, and/or governmental operations in the future is increasing.

CLIMATE CHANGE CONSIDERATIONS

Hazardous Spills/Release

Hazardous materials releases are typically caused by accidental conditions, which are not correlated with climate change. However, hazardous materials releases can result from a natural hazard event such as an earthquake, wildfire, or severe weather event.



Laguna Hills Local Hazard Mitigation Plan

Climate change may cause an increase in the number of these events affecting Laguna Hills. Hazardous materials releases during earthquakes, wildfire, and severe weather events can spread contamination to large geographic areas and amplify long-term impacts to human and ecological health.

Cyber Threat

While cyber threats may not be directly attributable to climate change, more extreme weather events due to climate change could impact computers at facilities that control essential resources, including water, energy, and infrastructure. Economic impacts related to climate change that threaten people's livelihoods, such as food insecurity, could also prompt criminals to engage in more cyber threats.

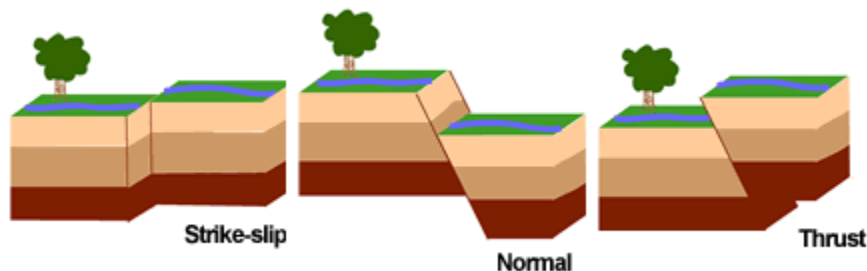
4.2.6 SEISMIC AND GEOLOGIC HAZARDS

DESCRIPTION

Surface Faulting and Ground Motion

The US Geological Survey (USGS) defines an earthquake as a sudden slip on a fault and the resulting ground shaking and radiated seismic energy caused by the slip (or any other sudden stress changes in the earth) (USGS, 2021a). Faults are fractures along the earth's crust between two blocks of earth and can be defined as a strike slip, normal, or thrust faults, as depicted in Figure 4-5, *Types of Faults*, below.

FIGURE 4-5: TYPES OF FAULTS



Source: U.S. Geological Survey, *Earthquake Glossary*, <https://earthquake.usgs.gov/learn/glossary/?term=earthquake>, accessed November 16, 2021.

Fault movement can occur rapidly, in the form of an earthquake, or may occur slowly, in the form of creep. During an earthquake, the rock on one side of a fault suddenly slips with respect to the other. Earthquakes occur without warning and result in effects such as ground motion, surface faulting, and ground failure (including liquefaction and landslides), described below.



Laguna Hills Local Hazard Mitigation Plan

Ground motion is seismic shaking (vibration) of the ground during an earthquake. When a fault ruptures, seismic waves radiate and cause the ground to vibrate. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter. Soft soils can further amplify ground motion (USGS, 2021b)

Seismic shaking can be strong enough to result in widespread devastation or virtually undetectable by the average person. The intensity of seismic shaking is a result of the release by the fault rupture (how much of the accumulated stress was released), the length of the rupture (the longer the slip along the fault line, the greater the shaking), and the depth at which the rupture occurs (ruptures that occur closer to the surface often cause stronger shaking). Usually, areas closest to the site of the rupture experience the greatest shaking, although differences in geology and soil can also have an impact.

Seismic shaking can damage or destroy buildings and structures and may cause partial or total collapse. Ground movement can damage or destroy infrastructure on or beneath the surface, such as roads, rail lines, and utility lines and pipes. This in turn, can cause hazardous materials releases, water main breaks, and other dangerous situations resulting from infrastructure failure. Falling debris and structures also create a risk of personal injury or death.

Surface faulting is the differential movement of two sides of a fracture, where the ground breaks apart. The length, width, and displacement of the ground characterize surface faults, which occur based on the type of underlying fault.

Faults occur at the boundaries between large sections of the earth's surface, called tectonic plates. Most of California sits on the North American plate, but coastal areas (including Laguna Hills) are on the Pacific plate. The San Andreas Fault is the main boundary between North American and Pacific plates, but other fault lines can be found up to 200 miles away. The presence of the San Andreas Fault and other faults is the reason for California's frequent seismic shaking and other tectonic activity.

Landslides, Mudflows, and Slope Instability

Areas with steep slopes and valleys are potentially subject to instability. These areas may be prone to hazards such as rock falls, slope failures, and debris flows. While earthquakes can cause landslides, other causes can include erosion, soil saturation, excess weight from accumulation of rain or snow, or man-made structures weakening slopes.



Laguna Hills Local Hazard Mitigation Plan

When a hillside or other slope becomes unstable, the soil and rocks that make up the slope slide toward the bottom. Landslides are often sudden, although some occur very slowly over a long period of time. Loose and fractured materials are more likely to slide than compact materials or solid rock, and steep slopes are at greater risk than gentle rises. Areas that have been recently burned by wildfires are more susceptible to sliding because the fire destroys the plant cover that helps stabilize slopes.

Regardless of the cause or specific form, a landslide can damage or destroy structures built on the sliding material or in its path. Underground infrastructure, such as pipelines or telecommunication lines, may be severed during a landslide. This could lead to infrastructure-induced flooding if water pipes are broken. In addition to property damage, landslides can crush or bury people, creating a risk of serious injury or death.

Liquefaction

Liquefaction is a phenomenon that occurs when ground shaking causes saturated soils, primarily clay-free deposits such as sand or silt, to lose strength and act like a viscous fluid. Soils that are poorly consolidated and combine with groundwater during an earthquake lose their shear strength and take on the properties of a heavy liquid. Certain soils are more susceptible to liquefaction, particularly younger and looser sediment closer to the water table. According to FEMA, liquefaction causes three types of ground failure, as described below (FEMA, 1997):

- Lateral spreads involve the lateral movement of large blocks of soil as a result of liquefaction of an underlying layer. They generally develop on gentle slopes, most commonly between 0.3 and 3 degrees. Horizontal movements commonly are as much as 10 to 15 feet. However, where slopes are particularly favorable, and the duration of ground shaking is long, lateral movement may be as much as 100 to 150 feet. Lateral spread usually breaks up internally, forming numerous fissures and scarps.
- Flow failures consist of liquefied soil or blocks of intact material riding on a layer of liquefied soil and are the most catastrophic type of ground failure caused by liquefaction. They commonly move several feet and up to dozens of miles under certain conditions. Flow failures usually form in loose saturated sands or silts on slopes greater than three degrees.
- Loss of bearing strength occurs when the soil supporting buildings or other structures liquefies. When large deformations occur, structures settle and tip. The general subsurface geometry required for liquefaction-caused bearing failures is



Laguna Hills Local Hazard Mitigation Plan

a layer of saturated, cohesionless soil that extends from near the ground surface to a depth equal to about the width of the building.

LOCATION AND EXTENT

Surface Faulting and Ground Motion

The City is located within the southern California region, known to be seismically active. There are no known active faults within the City of Laguna Hills; the San Joaquin Hills thrust fault trends northwest/southeast to the east of the City. However, the major regional faults likely to generate significant earthquakes of a magnitude of seven or higher are the San Andreas, San Jacinto, Elsinore-Whittier, and Newport-Inglewood faults. The Newport-Inglewood Fault Zone is the nearest major active fault and lies approximately three miles to the southwest of Laguna Hills. The San Joaquin Hills fault that underlies the City is believed to be capable of a large local earthquake, but is thought to be inactive and not zoned under the State's Alquist-Priolo Earthquake Fault Zone Act.

In Laguna Hills, the chance of an earthquake leading to surface faulting hazards is minimal, but both "active" faults and "potentially active" faults should not be discounted as sources of potential seismic harm. Due to the absence of active faults in the City, the risk of damage from surface faulting during an earthquake is limited. In addition, no faults within or near the City are within State of California-established Alquist-Priolo Earthquake Fault Zones, which are subject to special land use controls and building standards.

Southern California as a whole is subject to potential ground shaking in the event of an earthquake. Ground shaking can result in extensive structural damage, injury, and death. Ground shaking would be particularly damaging to residential buildings constructed of wood or reinforced masonry construction, and to mobile homes. Other buildings that do not typically perform well in earthquakes are soft-story buildings. These types of buildings have a story (typically the first floor) that lacks adequate strength or toughness due to too few shear walls. The most common measures of ground shaking during an earthquake event, the Richter Magnitude and Modified Mercalli Intensity scales are described below. Figure 4-6, *Earthquake Shaking Potential*, shows the potential for the City to experience earthquake ground shaking.

Richter Magnitude Scale

Seismic waves are vibrations from earthquakes that travel through the earth and are recorded on seismographs. Seismographs record a zigzag trace that shows the varying amplitude of ground oscillations beneath the instrument. The time, locations, and magnitude of an earthquake can be determined from the data recorded.



Laguna Hills Local Hazard Mitigation Plan

The Richter Magnitude Scale was developed by Charles Richter of the California Institute of Technology in 1935 to compare the size of earthquakes. The magnitude of an earthquake is determined from the logarithm of the amplitude of waves created by seismographs. Adjustments are included for variation in the distance between the various seismographs and the epicenter of earthquakes. Magnitude is expressed in whole numbers and decimal fractions beginning at zero with no upper limit, as described in *Table 4.8, Richter Scale of Earthquake Magnitude*. It should be noted that the Richter Scale does not express damage. An earthquake in a densely populated urban area may be lower on the Richter Scale but cause considerable damage when compared to a higher magnitude earthquake in a remote location (USGS, 2021c).

TABLE 4-8: RICHTER SCALE OF EARTHQUAKE MAGNITUDE

Magnitude Level	Category
1.0-2.9	Micro
3.0-3.9	Minor
4.0-4.9	Light
5.0-5.9	Moderate
6.0-6.9	Strong
7.0-7.9	Major
8.0 or higher	Great

Source: Rafferty, J., *Richter Scale*, <https://www.britannica.com/science/Richter-scale>, accessed November 16, 2021.

Modified Mercalli Intensity Scale

The effect of earthquakes on the earth's surface is referred to as intensity. The intensity scale consists of a series of certain key responses such as people awakening from sleep, movement of furniture, damage to chimneys, and destruction. Although numerous scales have been developed to evaluate earthquake effects, the scale currently used in the United States is the Modified Mercalli Intensity Scale (MMI Scale). The MMI Scale was developed in 1931 by American seismologists Harry Wood and Frank Neumann. This scale, composed of twelve increasing levels of intensity ranging from imperceptible shaking to catastrophic destruction, is designated by Roman numerals I through XII. It does not have a mathematical basis and is an arbitrary ranking based on observed effects. The MMI level of intensity assigned to a specific location is a more meaningful measure of severity to the nonscientist than the magnitude because intensity refers to the effects actually experienced. Refer to *Table 4-9, The Modified Mercalli Intensity Scale*, for lists abbreviated descriptions of the twelve MMI intensity levels.

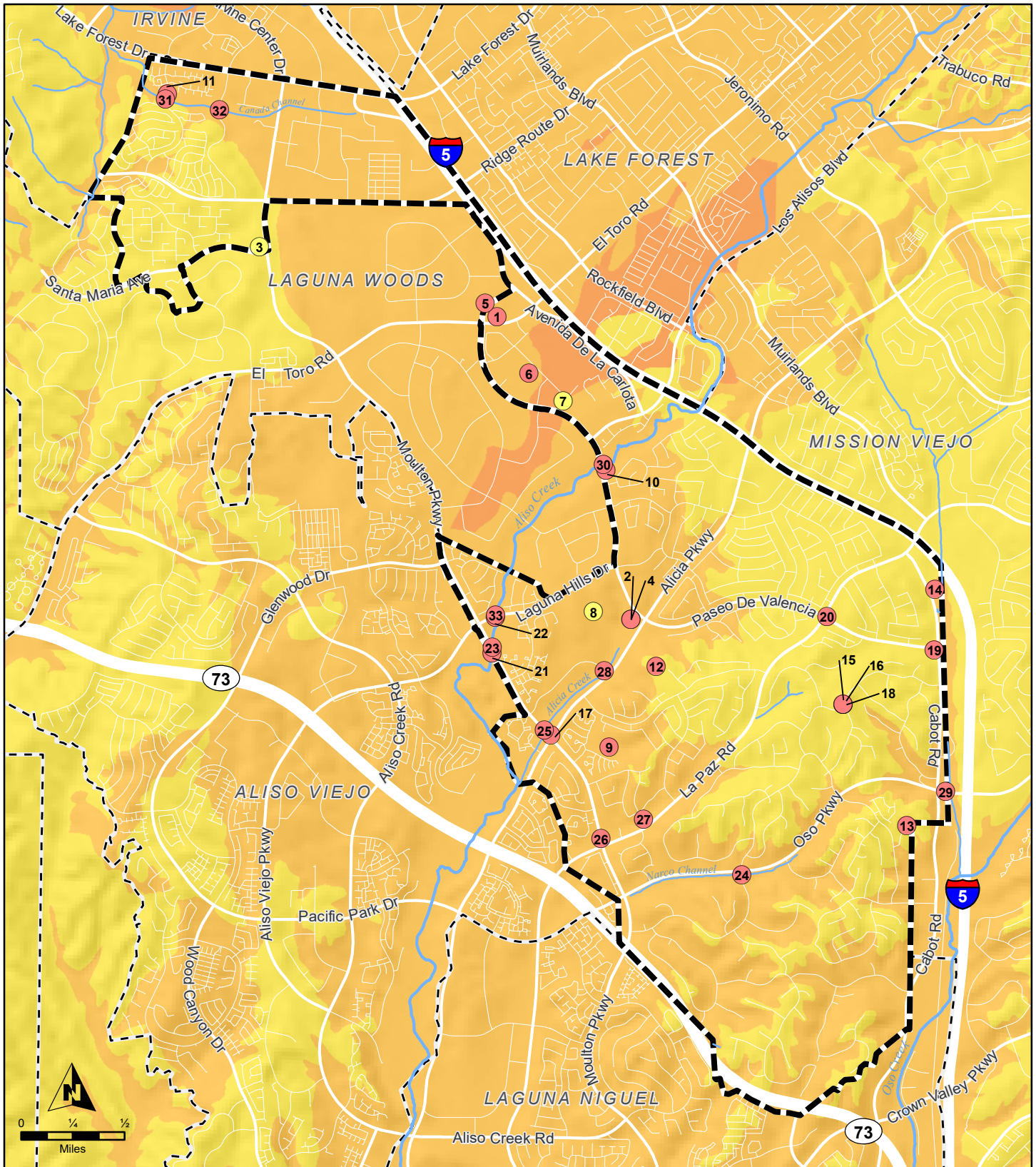


Laguna Hills Local Hazard Mitigation Plan

TABLE 4-9: THE MODIFIED MERCALLI INTENSITY SCALE

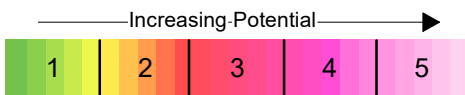
Intensity	Shaking	Description/Damage
I	Not Felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by few persons at rest, especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very Strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specifically designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Source: USGS, *The Modified Mercalli Intensity Scale*, https://www.usgs.gov/natural-hazards/earthquake-hazards/science/modified-mercalli-intensity-scale?qt-science_center_objects=0#qt-science_center_objects, accessed November 16, 2021.



Legend

- City of Laguna Hills
- Other Incorporated Area
- Critical Facility
- Facility of Concern



**CITY OF LAGUNA HILLS
LOCAL HAZARD MITIGATION PLAN**

Figure 4-6. Earthquake Shaking Potential

Sources: Orange County GIS; City of Laguna Hills; USGS NHD;
CGS Information Warehouse Map Sheet 48, 2016. Map date: March 9, 2022.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm



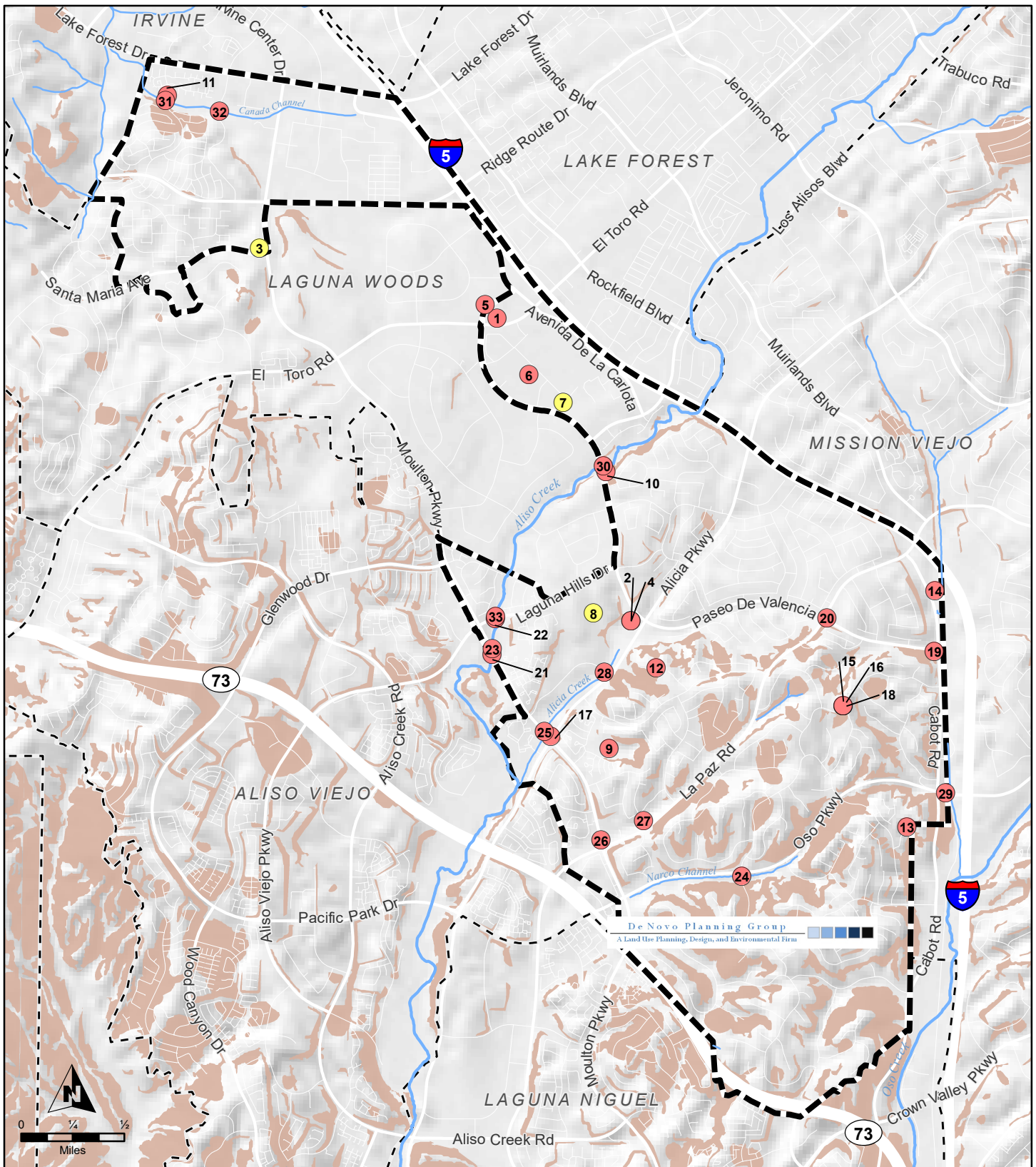
Laguna Hills Local Hazard Mitigation Plan

Landslides, Mudflows, and Slope Instability

According to the County of Orange and Orange County Fire Authority Local Hazard Mitigation Plan, locations at risk from landslides or debris flows (mudflows) include areas with one or more of the following conditions:

- On or close to steep hills.
- Steep road-cuts or excavations.
- Existing landslides or places of known historic landslides (such sites often have tilted power lines, trees tilted in various directions, cracks in the ground, and irregular-surfaced ground).
- Steep areas where surface runoff is channeled, such as below culverts, V-shaped valleys, canyon bottoms, and steep stream channels.
- Fan-shaped areas of sediment and boulder accumulation at the outlets of canyons.
- Canyon areas below hillside and mountains that have recently (within 1-6 years) been subjected to a wildland fire.

The topography of Laguna Hills includes several hills and valleys and therefore has the potential for slope instability and landslides. According to the General Plan Safety Element, slopes steeper than 25 degrees (approximately 2:1) are potentially subject to instability. Such areas may be prone to hazards such as surficial failures, mudflows, debris flows, rock falls, soil creep, and erosion. Failures of human-made slopes could also occur in some of the previously developed areas of the City. In addition, wildfires can destabilize hillsides and create hydrophobic soils, leading to an increased potential of landslides and debris flows. The potential for earthquake-induced landslides in hillside terrain is also present. Areas of known landslides or areas generally susceptible to landslides and slope instability within Laguna Hills have been identified and mapped by the California Geological Survey (CGS); refer to Figure 4-7, *Landslide Hazard Zones*.



Legend

- City of Laguna Hills
- Other Incorporated
- Landslide Hazard Zones
- Critical Facility
- Facility of Concern

CITY OF LAGUNA HILLS
LOCAL HAZARD MITIGATION PLAN

Figure 4-7. Landslide Hazard Zones

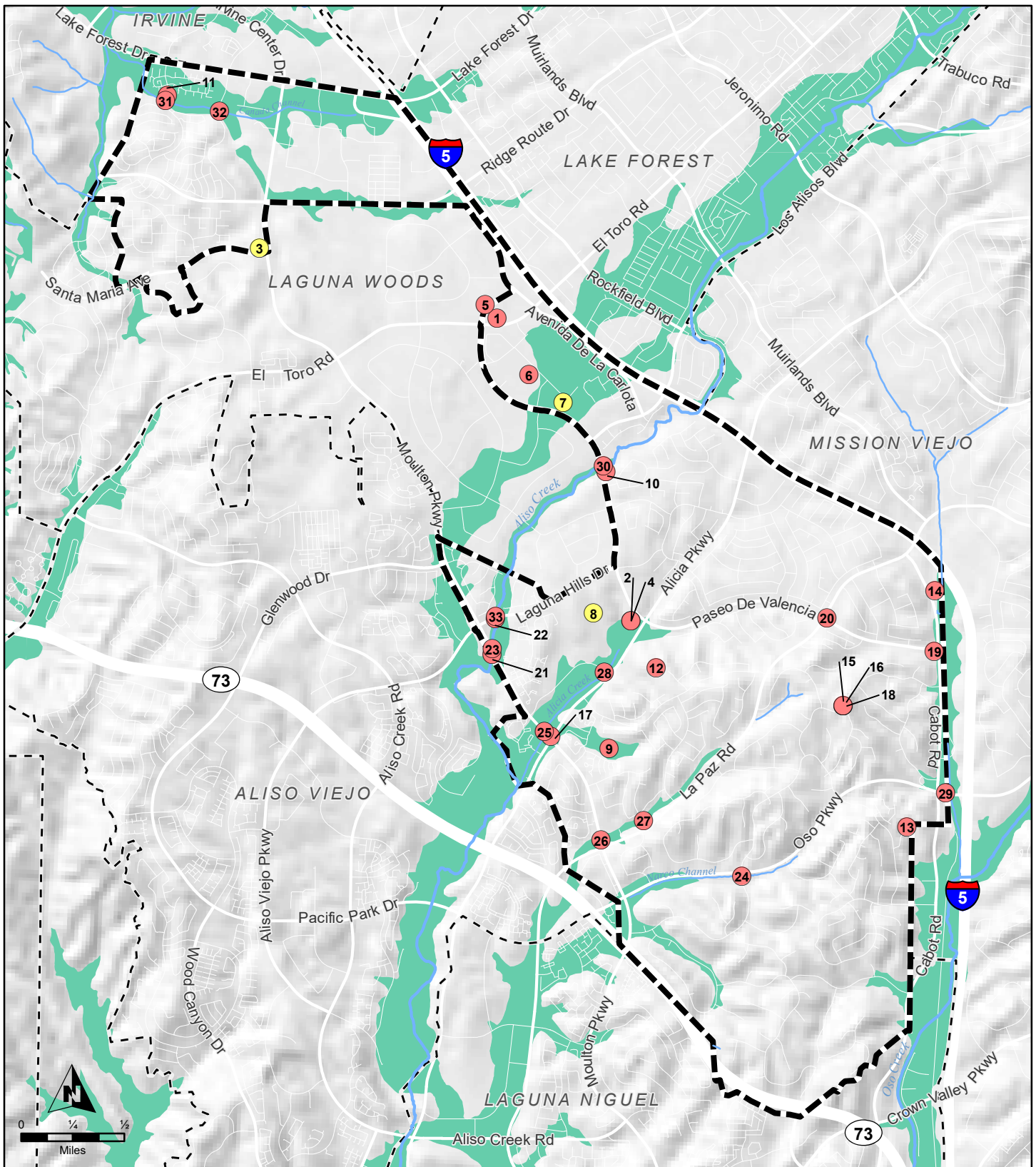


Laguna Hills Local Hazard Mitigation Plan

Landslides and mudflows have different predictability and velocity levels depending upon the nature and location of the event. Slow landslides may damage structures and infrastructure and are difficult to stabilize due to their large size. However, slow landslides allow people to evacuate before there is the danger of loss of life. Landslides and mudflows with high velocity can destroy structures or other lifeline utilities and can cause significant loss of life or injury. The severity of a landslide is often measured by the amount of material that slides (e.g., in cubic feet) (Highland & Bobrowsky, 2008). Mudflows tend to be more fluid and because they flow down a stream or creek, they can extend beyond the community in which they originated. Mudflows can occur suddenly without time for adequate warning and reach 100 miles per hour. Monitoring of weather conditions and understanding historic fire conditions within the area can help to identify conditions in which mudflows are likely.

Liquefaction

Liquefaction generally occurs within areas that have high groundwater (less than 20 to 30 feet below the surface), loose sandy alluvial deposits (usually of recent age), and the potential for significant ground shaking. Portions of the City occupied by alluvial valleys have these characteristics. Liquefaction susceptibility is located in the northern portion of the City in drainages south of Lake Forest Drive and along Ridge Route Drive; Aliso Creek (Laguna Hills Mall area) and tributaries to the south (including Alicia Parkway); Sulphur Creek and a tributary; and Oso Creek along southbound Interstate 5 (I-5); refer to Figure 4-8, *Liquefaction Hazard Zones*. Liquefaction zones identify areas where the potential for liquefaction is relatively high, and in the event of development, would require detailed site-specific geotechnical investigations. Incorporating proper geotechnical engineering techniques in development projects within these areas can reduce the risks associated with seismic hazards to people and property.



Legend

- | | | | |
|--|--------------------------|--|---------------------|
| | City of Laguna Hills | | Critical Facility |
| | Other Incorporated Area | | Facility of Concern |
| | Liquefaction Hazard Zone | | |

CITY OF LAGUNA HILLS
LOCAL HAZARD MITIGATION PLAN

Figure 4-8. Liquefaction Hazard Zones



Laguna Hills Local Hazard Mitigation Plan

PREVIOUS OCCURRENCES

As discussed above, a variety of faults are located near the City of Laguna Hills. Earthquakes of low to moderate magnitude have occurred infrequently in the region around the City based on instrumental recordings. Table 4-10, *Major Earthquake Faults of Particular Concern*, identifies faults of concern and last major ruptures.

TABLE 4-10: MAJOR EARTHQUAKE FAULTS OF PARTICULAR CONCERN

Fault Name Type of Faulting	Last Major Rupture	Slip Rate (mm/year)	Interval Between Major Ruptures	Probable Magnitudes
Elsinore Right-lateral strike-slip	May 15, 1910 Magnitude 6.0 (no surface rupture)	Roughly 4.0	Roughly 250 years	6.5–7.5
Newport-Inglewood Right-lateral; local reverse slip	March 10, 1933 Magnitude 6.4 (no surface rupture)	0.6	Unknown	6.0–7.4
San Andreas Right lateral strike-slip	April 18, 1906 Magnitude 7.9	20 to 35	Varies; between 20 and 300 years	6.8–8.0
San Jacinto Right-lateral strike-slip; minor right-reverse	April 9, 1968 Magnitude 6.5	7 to 17	Varies; between 100 and 300 years	6.5–7.5
San Joaquin Hills Blind thrust	Unknown; potentially 1855	0.42 to 0.79	Unknown	>7.0

Source: Southern California Earthquake Center, Significant Earthquakes and Faults, <http://scedc.caltech.edu/significant/fault-index.html>, accessed February 6, 2019. Grant, Lisa B. et al, Coastal Uplift of the San Joaquin Hills, Southern Los Angeles Basin, California, by a Large Earthquake since A.D. 1635, Bulletin of the Seismological Society of America, Volume 92, No. 2, pp 590–599, March 2002.

Table 4-11, *Significant Historical Earthquakes in Southern California*, identifies major earthquakes that have occurred in southern California. Several of these earthquakes occurred prior to the City's incorporation in 1991. The Northridge Earthquake and the Whittier Narrows Earthquake both resulted in major disaster declarations from the federal government, which included Orange County as a designated area (FEMA, 2020).



Laguna Hills Local Hazard Mitigation Plan

TABLE 4-11: SIGNIFICANT HISTORICAL EARTHQUAKES IN SOUTHERN CALIFORNIA

Earthquake Name	Year	Estimated Magnitude
Wrightwood	1812	7.5
Los Angeles	1855	6.0
San Bernardino	1858	6.0
Elsinore	1910	6.0
San Jacinto	1918	6.8
North San Jacinto	1923	6.3
Long Beach	1933	6.4
San Fernando	1971	6.5
Whittier Narrows	1987	5.8
Newport Beach	1989	4.7
Northridge	1994	6.7
Chino Hills	2008	5.4

Source: Southern California Earthquake Data Center, Significant Earthquakes and Faults, <http://scedc.caltech.edu/significant/index.html>, accessed March 4, 2022.

The California Geological Survey does not identify any previous instances of liquefaction within the City limits (California Department of Conservation, 2001). The City is located within the San Juan Capistrano and Lake Forest Quadrangles. A review of the Seismic Hazard Zone Report for the San Juan Capistrano Quadrangle Hazard indicates small areas of ground failures from liquefaction are noted to have been found during development projects in the City of Laguna Niguel. Specific locations, type of ground failure, or reasons why these ground failures are attributed to liquefaction were not identified. Aside from the above-mentioned suggestion there are no areas of historic or paleoseismic liquefaction documented in the larger San Juan Capistrano Quadrangle. Further, no previous instances of liquefaction areas within the Lake Forest Quadrangle have been identified (California Department of Conservation, 2000).

Most recently, southern California experienced ground shaking during an earthquake on June 5, 2021 with an epicenter seven miles west of Calipatria (Imperial County, California). The local magnitude of the earthquake was 5.3 and included a series of foreshocks and aftershocks. Minor ground shaking was experienced in Laguna Hills, and no damage in the City was reported (USGS, 2022).

PROBABILITY OF FUTURE OCCURRENCES

Laguna Hills is in a known seismically active area, and thus the probability for future seismic hazard occurrences is considered high. Given the significant seismic shaking events in the region, it is certain that such events will continue. The southern California region has many fault lines (including major faults), and it is almost inevitable that a



Laguna Hills Local Hazard Mitigation Plan

regional fault line will rupture in the foreseeable future and cause a major seismic shaking event. The USGS Uniform Earthquake Rupture Forecast Version 3 released in 2017 provides a perspective of the likelihood each California region will experience a magnitude 6.7 or larger earthquake in the next 30 years in Orange County; refer to Table 4-12, *Likelihood of Earthquakes Occurring in the Next 30 Years*.

TABLE 4-12 LIKELIHOOD OF EARTHQUAKES OCCURRING IN THE NEXT 30 YEARS

Magnitude	Elsinore Fault	Newport-Inglewood Fault	Southern San Andreas Fault	San Jacinto Fault	San Joaquin Hills Fault
M≥6.7	3.66%	0.70%	19.21%	5.41%	0.42%
M≥7.0	1.82%	0.63%	12.86%	5.39%	0.40%
M≥7.5	0.90%	0.20%	10.21%	5.28%	0.24%
M≥8.0	<0.01%	--	3.24%	2.75%	--

Source: U.S. Department of the Interior and US Geological Survey, *The Third California Earthquake Rupture Forecast (UCERF3)*, Google Earth file with fault probabilities, March 2015.

Note:

1. M≥6.7 means magnitude greater than or equal to 6.7, and likewise for the other magnitude thresholds.
2. The 30-year period measured by this report is 2014 to 2044; a 30-year period is the typical duration of a homeowner mortgage.

Based on the data above, and the historic occurrences of earthquake activity in southern California, it is concluded there is a high probability of future activity impacting the City of Laguna Hills.

CLIMATE CHANGE CONSIDERATIONS

Earthquakes are caused by seismic activity, which is not directly correlated with climate change. However, climate change could bring more severe rain events increasing the amount of water saturation in loose soils. The increased saturation combined with an earthquake event could cause liquefaction or landslides to occur in the City.

4.2.7 SEVERE WEATHER

DESCRIPTION

Heavy Rains

According to the National Weather Service/National Oceanic and Atmospheric Administration, a severe thunderstorm must have at least one of the following: hail that is one inch in diameter or larger; or winds of 58 miles per hour or greater (National Weather Service, 2022). About 10 percent of thunderstorms in Orange County are classified as severe. They usually occur when cool, moist air moves in to break a prolonged hot spell.



Laguna Hills Local Hazard Mitigation Plan

The storms are usually short-lived and infrequent. They are usually no more than a quarter of a mile wide. Over the interior mountain areas, storms are more intense, and they may become unusually severe on occasion at intermediate and high elevations. Although not defined as severe weather, Laguna Hills experiences heavy rain events that can result in localized flooding, mudflows, and fallen tree limbs or brush that block roadways and drainage systems.

Santa Ana Winds

Santa Ana winds push dry air from the inland deserts of California and the Southwest over the mountains between coastal California and the deserts. They are created when high pressure over the high desert of the Great Basin region causes winds on the southern side of high to blow from the east, toward the Pacific Ocean and lower air pressure offshore. The phenomenon occurs during the fall and early winter. These hot and very dry winds dry out vegetation, increasing the fuel available to feed fires. Gusty winds also fan flames and spread fire (Los Angeles Times, 2008).

Extreme Heat

Extreme heat conditions are defined as weather that is much hotter than average for a particular time and place, and sometimes more humid. The heat index is a measure of how hot it feels when relative humidity is factored into the actual temperature. High humidity can cause the heat index to increase drastically and create dangerous health conditions (Environmental Protection Agency & Center for Disease Control, 2016).

Typically, the National Weather Service (NWS) issues Excessive Heat Warning/Advisory when the heat index is predicted to be 105°F or greater for two or more consecutive days, although the temperature cut-off varies for different regions (California Environmental Protection Agency & California Department of Public Health, 2013). Cal-Adapt identifies an extreme heat day or warm night as a day in a year when the daily maximum/minimum temperature exceeds the 98th historical percentile of daily maximum/minimum temperatures based on the historical data from 1961-1990 between April and October. For the City of Laguna Hills, the 98th percentile would be 90.1 degrees Fahrenheit (°F) (Cal-Adapt, 2022). Additionally, Cal-Adapt defines a heat wave as periods of four consecutive extreme days or warm nights when the daily temperature is above the extreme heat threshold.

Power Outage

Power outages are a secondary effect of severe weather events in Laguna Hills. During severe weather incidents, such as high winds, San Diego Gas and Electric (SDG&E) and



Laguna Hills Local Hazard Mitigation Plan

Southern California Edison (SCE), suppliers of electricity to the City, may implement an operational practice called Public Safety Power Shutoffs (PSPS), to preemptively shut off power in high risk areas during potentially dangerous fire conditions. This program is designed to proactively prevent electric systems from starting a wildfire when winds and temperatures are high.

Strong Santa Ana winds, high temperatures, and low humidity are all severe weather conditions that could trigger a PSPS event. The frequency of PSPS events depends on weather and environmental factors; SDG&E and SCE make decisions to implement PSPS based on internal thresholds, assessment of real-time information, and situational awareness data. If a PSPS is necessary, SDG&E and SCE communicate with public safety authorities, first responders, and the affected communities. Additionally, customers are notified prior to shutting off power, where conditions allow advanced notification.

When weather forecasts indicate extreme fire conditions, SDG&E and SCE begin predictive modeling to assess potential impacts while monitoring weather watch alerts from the National Weather Service. Leading up to an event, weather forecasts and the potential for wildfire are refined. Two days prior to extreme fire conditions forecasted, SDG&E and SCE would coordinate first with the local government, emergency management community, and first responders. A first notification would go out to customers 48 hours prior to the shut off, a second notification 24 hours prior, and a final notification with power shut off. It is noted that actual or sudden onset of extreme weather conditions could impact coordination and notification efforts (San Diego Gas & Electric, 2022 and Southern California Edison, 2022).

Outside of the PSPS events, there is the potential for power outages to occur within the City. SCE defines a major outage as a large unexpected outage caused by either accidents or natural disasters. While uncommon, loss of electrical power is a potential secondary effect of severe weather events.

LOCATION AND EXTENT

A heavy rain, Santa Ana wind, or extreme heat event would occur throughout the entire City of Laguna Hills. While PSPS would only affect certain circuits within the City, a major power outage could affect the entirety of the City, including public infrastructure such as water/wastewater, transportation facilities, and emergency services. Although most of Laguna Hills powerlines are located underground, they are connected to regional lines which are located aboveground. Therefore, power outages or interruptions could occur from events not directly impacting the City.



Laguna Hills Local Hazard Mitigation Plan

Heavy Rains

One of the indicators for a heavy rain season is the Oceanic Niño Index (ONI), used to monitor the El Niño-Southern Oscillation (ENSO). To calculate the ONI, scientists from the National Oceanic and Atmospheric Administration's (NOAA) Climate Prediction Center calculate the average sea surface temperature in the El Niño 3.4 region (area of the east-central equatorial Pacific Ocean) for each month, and then average it with values from the previous and following months. This running 3-month average is compared to a 30-year average. The observed difference from the average temperature in that region, whether warmer or cooler, is the ONI value for that 3-month "season." Based on the ONI, the El Niño (warm) and La Niña (cool) events in the tropical Pacific are categorized as weak, moderate, strong, or very strong (NOAA, 2021b).

Laguna Hills experiences an average of 14.2 inches of rain per year and gets precipitation, on average, 37 days per year. Precipitation is rain, snow, sleet, or hail that is at least .01 inches on the ground. Typically, the City's drainage systems have been able to accommodate heavy rain events, as the City proactively inspects, cleans, and clears catch basins and flow lines to prevent flooding and other issues in anticipation of a storm. However, some locations do not have a secondary outlet and cannot handle the increased flow; refer to the Flood discussion above. Additionally, the Nellie Gale Ranch Home Owner's Association (HOA) maintains a series of equestrian trails that experience erosion during heavy rain events. During heavy rain events, sandbags are utilized to prevent erosion and runoff into the public storm drain.

Santa Ana Winds

Hurricane winds are measured using the Saffir-Simpson Hurricane Wind Scale. Although hurricane events are not typical within Laguna Hills, the scale can be used to measure strong winds that are not associated with a hurricane event. The scale uses measurements in pressure, wind speed, and damage potential to identify the types of damage associated with sustained wind events; refer to Table 4-13, *Saffir-Simpson Hurricane Wind Scale*. A Santa Ana wind event would occur throughout the City.



Laguna Hills Local Hazard Mitigation Plan

TABLE 4-13: SAFFIR-SIMPSON HURRICANE WIND SCALE.

Category	Sustained Wind Speed	Description of Damages
1	74–95 mph	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding, and gutters. Large branches of trees will snap, and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96–110 mph	Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3	111–129 mph	Devastating damage: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4	130–156 mph	Catastrophic damage: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5	157 mph or higher	Catastrophic damage: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or

Source: National Hurricane Center, Saffir-Simpson Hurricane Wind Scale, <https://www.nhc.noaa.gov/aboutsshws.php>.

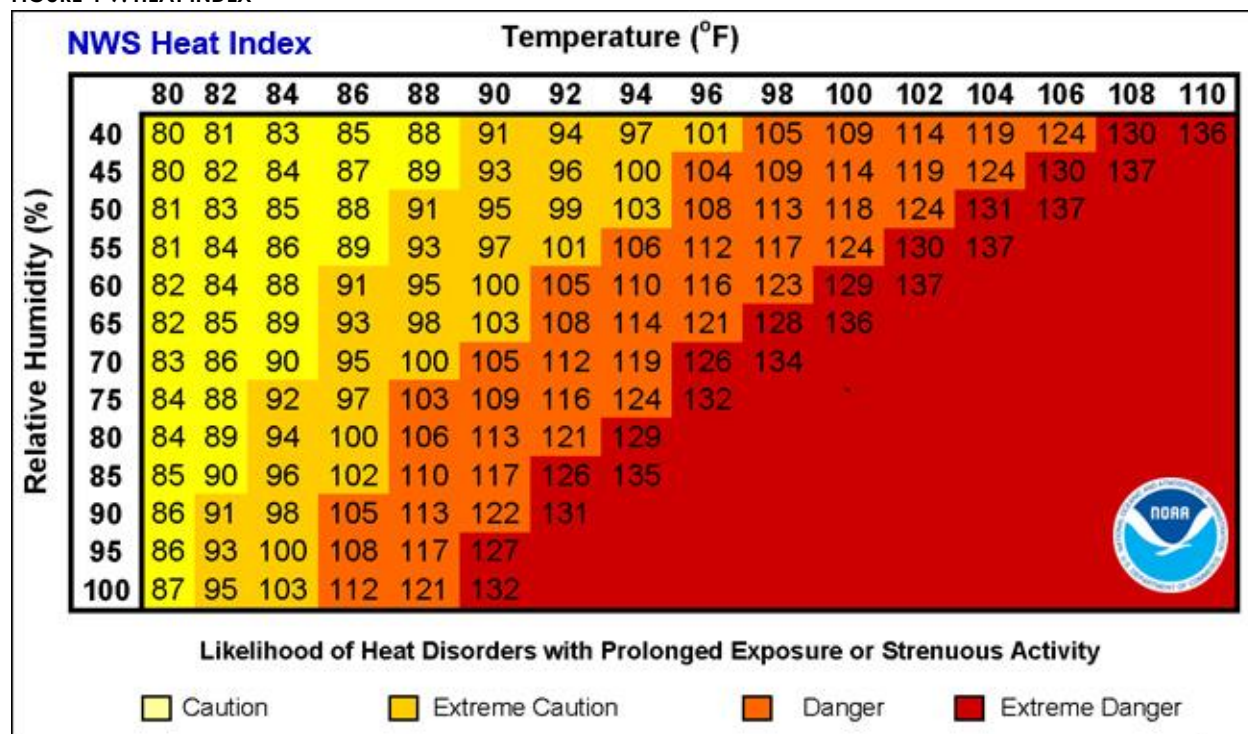
Extreme Heat

The Heat Index, which measures the “apparent temperature” when considering both air temperature and humidity, is used by the NWS to identify extreme heat days. Extreme heat is particularly dangerous when occurring for a prolonged period (heat waves). Figure 4-9, *Heat Index*, shows the likelihood of heat disorder with prolonged exposure or strenuous activity associated with various temperatures and relative humidity. As described above, the NWS indicates alert procedures when the Heat Index is expected to exceed 105°–110°F (depending on local climate). An extreme heat event would occur throughout the City.



Laguna Hills Local Hazard Mitigation Plan

FIGURE 4-9: HEAT INDEX



Source: National Weather Service, *NEW Heat Index*,
<https://www.weather.gov/images/safety/heatindexchart-650.jpg>.

Power Outage

High Fire Risk Areas are areas with circuits within California Public Utilities Commission's (CPUC) Tier 2 (elevated risk) and Tier 3 (extreme risk) Fire Threat Areas. The CPUC Fire-Threat Map was developed with input from the U.S. Forest Service, California Department of Forestry and Fire Protection, and the State's investor-owned utilities, including SDG&E and SCE.

SCE uses their own thresholds prior to initiating a PSPS event. When evaluating weather and environmental conditions, SCE considers a variety of factors which include but are not limited to:

- National Weather Service Red Flag Warnings
- SCE meteorological assessments
- SCE Fire Potential Index
- SCE Fire Scientist assessments
- Real-time situational awareness information



Laguna Hills Local Hazard Mitigation Plan

- SCE Fire Management/Office of Emergency Management input
- Concerns from local or State fire authorities
- Mandatory or voluntary evacuation orders in place
- Expected impact of de-energizing circuits on essential services (including public safety agencies, water pumps, traffic controls, etc.)
- Other operational considerations to minimize wildfire ignitions

SDG&E leverages a multitude of situational awareness data and input from its subject matter experts when deciding whether to de-energize. Through experience, SDG&E learned that it is not appropriate to use a prescriptive technique to determine when to use PSPS as wildfire conditions are dynamic and not every situation is the same. In determining whether to employ a PSPS in a given area of its system, SDG&E analyzes and weighs several facts in real-time, including: meteorology and weather conditions, vegetation conditions and Vegetation Risk Index, field observations, information from first responders, flying and falling debris, expected duration of conditions, and location of existing fires or wildfire activity in the region or state that would affect resource availability.

PREVIOUS OCCURRENCES

Heavy Rains

The rainy season in Laguna Hills traditionally occurs between November into early May; although severe rains have occurred during other times of the year when weather conditions permit. Refer to the Flood Hazard Profile for a summary of specific regional storms that caused heavy rains in the City. A heavy rainstorm in 2005 caused overflows of a channel that extends from Moulton Parkway to Avenida De La Carlota. Segments of Moulton Parkway and Del Lago Drive were under water, causing several vehicles to become stranded. Water from the I-5 freeway also flooded the El Toro Road underpass and caused several vehicles to be stranded. During the week of December 16 – 23, 2010, record and historic rain levels were recorded in Orange County and in 2018/2019, the County experienced several rain events involving consecutive days of heavy rains.

Santa Ana Winds

Santa Ana winds occur annually between September to May in the City of Laguna Hills. These events have caused tree limbs to fall and debris to scatter, at times resulting in blocked roadways.



Laguna Hills Local Hazard Mitigation Plan

Extreme Heat

Laguna Hills experiences an average of five extreme heat days per year, although some years over the past decades have seen as few as one or as many as 14 extreme heat days (Cal-Adapt, 2022). In February 2022, the NWS issued excessive heat warnings in Los Angeles, Orange County, and the Inland Empire. Table 4-14, *Orange County Extreme Heat Events*, summarizes recent notable extreme heat events identified by the NWS in and around the forecast area. Some events from Los Angeles and surrounding areas are included. Events were included based on infrequency, severity and impact.

TABLE 4-14: ORANGE COUNTY EXTREME HEAT EVENTS

Dates	Description
June 28– June 30, 2013	A heat wave on the order of a 20-year event enveloped the west and southern California. Death Valley reached the highest June temperature ever recorded in the United States: 129°F on June 30. Other desert cities like Palm Springs, Thermal, and Borrego Springs tied or set new June records and came within 1 degree of the all-time highest temperature on record on June 29.
April 30– May 1, 2014	On April 30, temperatures soared past 90°F along the coast, breaking many daily high temperature records. Winds kept the minimum temperature in Anaheim at 77°F. On May 1, temperatures at all lower-elevation stations were in the 90s, with Chula Vista topping the list at 100°F.
May 13– May 15, 2014	Strong high pressure and a strong late-season Santa Ana wind event combined to bring record high temperatures exceeding 100°F to most of the lower elevations on these days. Many all-time high temperature records for the month of May were broken. The hottest day was May 15 when it was 106°F in Yorba Linda and the San Diego Wild Animal Park.
March 13– March 16, 2015	Strong high pressure and Santa Ana conditions boosted temperatures into the 90s across the coast and valleys each day, with cooling only into the 60s at night. Numerous daily high maximum and daily high minimum records were set. The warmest day, on March 13, was 96°F in Santa Ana. Highest minimum temperatures were 68°F in Santa Ana and San Diego on March 15.
September 1– September 3, 2017	A strong high-pressure system stalled over the western US and allowed temperatures to rise into the triple digits. This heatwave was documented as the greatest statewide heat wave ever recorded in California (at the time). Readings soared above 110°F across the Central Valley, while in southern California, days of triple-digit heat fueled the largest wildfire on record in the City of Los Angeles (La Tuna Fire).
July 1 – July 6, 2018	A strong high-pressure system obliterated heat wave records across southern California, as part of the larger North American Heat Wave. Santa Ana recorded 114°F on July 6; Riverside tied a record at 118°F and UCLA recorded an all-time hottest record at 111°F. The Chino automated weather station recorded 120°F – the highest temperature ever recorded by any automated weather station in the valleys or coastal areas around Orange, Riverside, San Bernardino and San Diego counties. Additionally, several hottest all-time overnight low temperatures were recorded in Burbank (82°F) and Los Angeles (79°F).



Laguna Hills Local Hazard Mitigation Plan

Dates	Description
September 6, 2020	A historic heat wave swept through Southern California during the Labor Day weekend. Woodland Hills set a record temperature of 121 degrees on Sunday afternoon, the highest official temperature ever recorded in Los Angeles County according to the National Weather Service.
February 9 – February 13, 2022	A heat advisory was issued for Los Angeles and Orange counties and the Inland Empire due to unseasonably hot weather, with temperatures up to 20 degrees above normal. It was the first heat advisory issued by the National Weather Service in Los Angeles during the month of February since 2006.
June 2022	A heat advisory was issued for several parts of southern California due to triple-digit temperatures.

Source: National Weather Service, A History of Significant Weather Events in Southern California, updated May 2017; Climate Signals beta, Southern California Heat Wave July 2018 and September 2017; NASA Earth Observatory, California Heatwave Fits a Trend, <https://earthobservatory.nasa.gov/images/147256/california-heatwave-fits-a-trend>; KTLA, February 9, 2022, Heat wave: SoCal to see unseasonably hot temperatures up to 20 degrees above normal.

Power Outage

Laguna Hills has never experienced a City-wide power outage due to severe weather. On May 9, 2014, more than 1,900 customers in Laguna Hills experienced a power outage, due to an equipment issue. On June 3, 2022, Laguna Hills Village experienced an afternoon power outage that affected clubhouses and approximately 960 manors. Generators were initiated, ensuring no vital operations were affected. Other area-specific power outages are likely to have occurred, including planned power outages.

PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences and weather trends in southern California and the location of Laguna Hills in south Orange County, there is a medium probability that hazards such as heavy rains, high winds, extreme heat, landslides, and wildfire could disrupt energy service. Energy delivery services, specifically electricity delivery, is subject to harm during extreme heat events. Extreme heat puts more stress on power lines and energy infrastructure, which can cause the energy grid to perform less efficiently. This, coupled with more electricity demand from air conditioning units, can lead to power outages.

CLIMATE CHANGE CONSIDERATIONS

Climate change has direct effects on heavy rain events. According to research conducted by UCLA, California will experience extremely wet and extremely dry seasons by the end of the century. Climate scientists predict that “over the next 40 years, the



Laguna Hills Local Hazard Mitigation Plan

State will be 300 to 400 percent more likely to have a prolonged storm sequence as severe as the one that caused the legendary California flood more than 150 years ago." As discussed in the General Plan Safety Element, Laguna Hills is projected to experience a slight increase in overall annual precipitation levels, with precipitation expected to fall in fewer, more extreme events, such as atmospheric rivers.

According to the California Adaptation Planning Guide, local heat waves are likely to occur much more frequently. Climate models project a significant rise in the number of days exceeding what is not considered extremely hot for Laguna Hills. The number of heat waves is very likely to increase because of climate change, reflecting the global trend. According to Cal-Adapt, the number of extreme heat days in Laguna Hills, defined as a day when the high temperature is at least 90.1°F, is expected to rise from a historical annual average of five days per year to 12 days per year by the middle of the century (2040-2069), and to an average of 25 days per year by the end of the century (2070 to 2099) (Cal-Adapt, 2022). The number of warm nights in Laguna Hills is also expected to increase, which is defined as temperatures above 65°F. Climate change is expected to increase the number of warm nights from a historical annual average of four nights per year to 41 warm nights per year by the middle of the century and 80 warm nights per year by the end of the century.

SCE reports that increased power outages are directly related to climate change, and states on their website that PSPS will become "the new normal during high fire/wind events." PSPS will become increasingly required to mitigate fire risk as increased severity and duration of extreme weather events occur.

Additionally, climate change may result in storm events, Santa Ana winds, and heat waves occurring outside of traditional seasons of the year. This could increase secondary effects, such as flooding, erosion, or wildfire events.

4.2.8 WILDFIRE AND URBAN FIRES

DESCRIPTION

A wildfire is defined as an unplanned and unwanted wildland fire, including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fire where the object is to extinguish the fire. Wildfire is a natural part of the southern California ecosystem, helping to clear brush and debris, and is a necessary part of the various species' life cycles. Wildfires can be sparked by lightning, accidents, or arson.

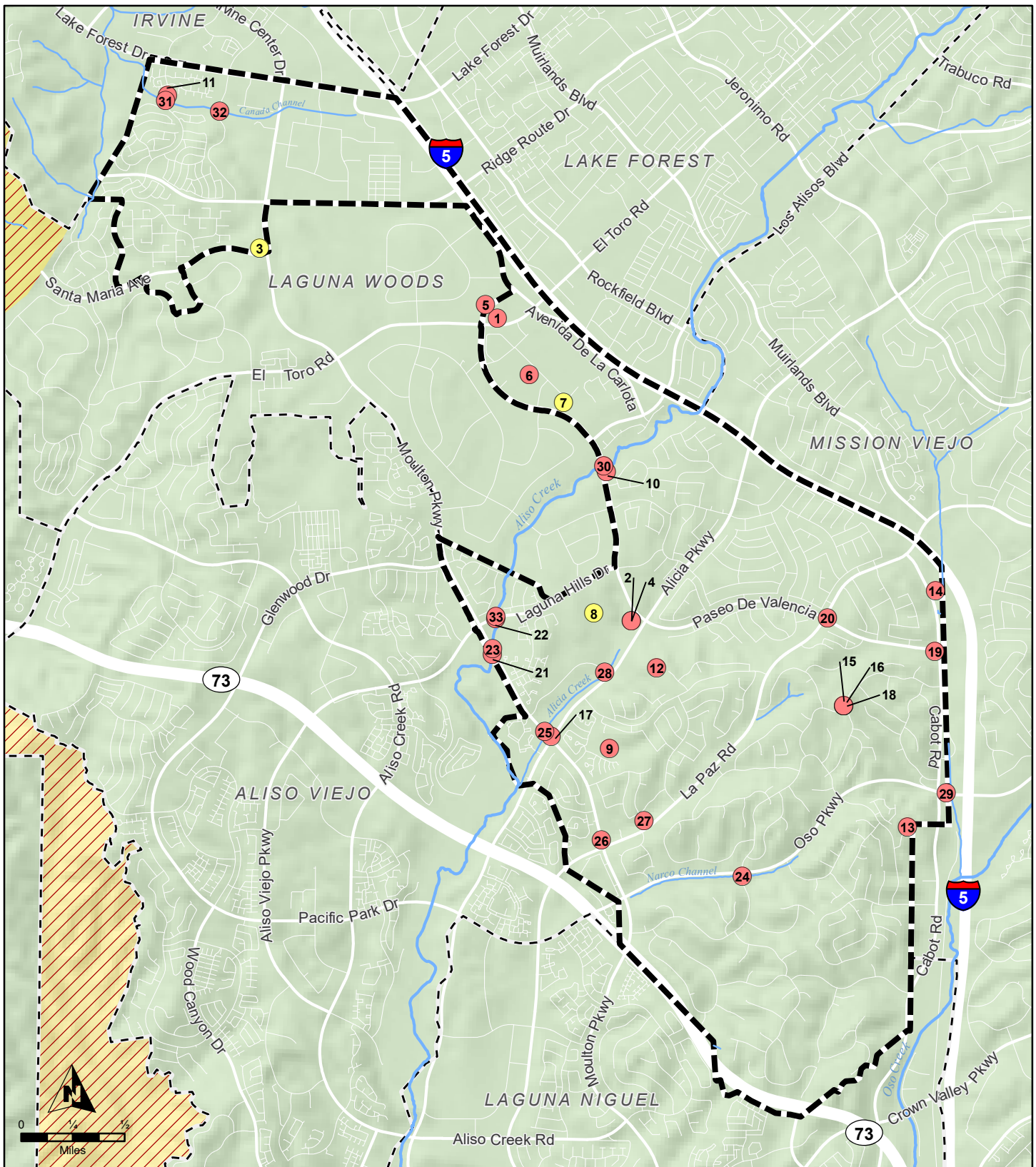


Laguna Hills Local Hazard Mitigation Plan

Human activity has changed the buffer zone between urbanized and undeveloped areas, known as the wildland-urban interface, where naturally fire-prone landscapes abut developed neighborhoods. The natural setting of a wildland-urban interface can make these areas highly desirable places to live, and many of these areas in California are now developed. This development has brought more people into wildfire-prone areas. The availability of fuel and increasing encroachment into the wildland-urban interface have made wildfires a common and dangerous hazard in California. Certain development patterns pose more difficult fire problems. These include multi-story, wood frame, high-density apartment developments; multi-story research developments; large continuous developed areas with combustible roofing materials; and facilities that use and/or store hazardous materials. Features of structural conditions that affect fire control include the type and use of structure, area of building, number of stories, roof covering, and exposures to the building.

LOCATION AND EXTENT

While major wildfires pose a significant risk in the large, open space hillsides and areas in other parts of Orange County, the urbanized nature of Laguna Hills and the adjacent areas significantly reduces the threat of large, catastrophic wildfires within the City. Nevertheless, wildland fire hazards do exist. The California Department of Forestry and Fire Protection (CAL FIRE) prepares wildfire hazard severity maps including mapping areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones (FHSZ), define the application of various mitigation strategies and influence how people construct buildings and protect property to reduce risk associated with wildland fires. While FHSZ do not predict when or where a wildfire will occur, they do identify areas where wildfire hazards could be more severe and therefore are of greater concern. Zones are designated on varying degrees from moderate, high, and very high. While there are no areas of Laguna Hills that are within designated Very High Fire Hazard Severity Zones (see Figure 4-10, *Fire Hazard Severity Zones*), the northwestern neighborhoods of the City are adjacent to areas designated as High and Very High Fire Hazard areas by CAL FIRE, including the open space in the Laguna Coast Wilderness Park in the City of Irvine. Due to the City's proximity to these wildland areas, the northwest portion of the City is within a wildland-urban interface; refer to Figure 4-11, *Wildlife-Urban Interface*. In addition, areas within the southern portion of the City, as well as some hillside corridors with natural terrain and open areas, are also at risk for fire hazards.



Legend

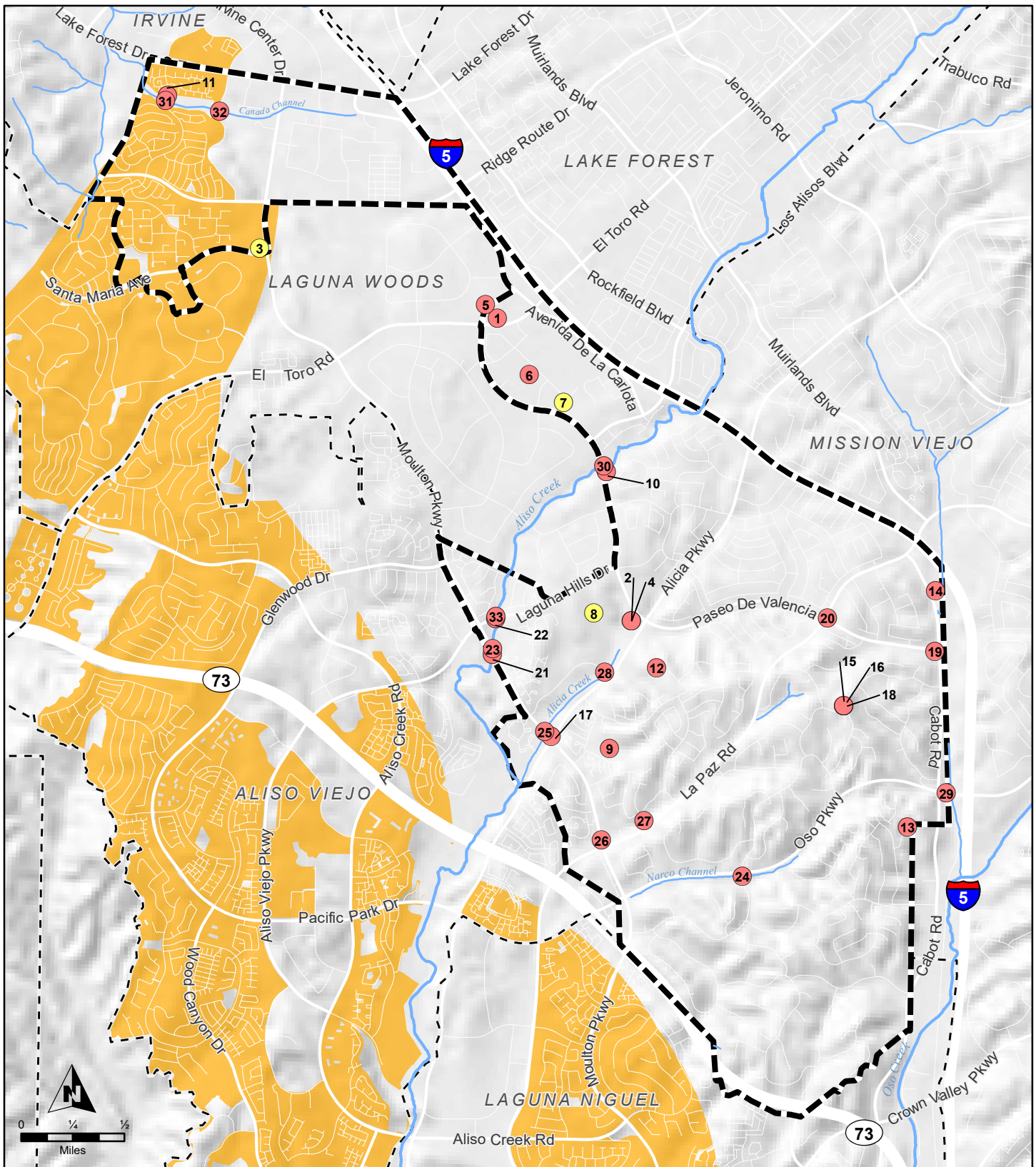
- | | | | |
|--|---------------------------|--|--|
| | City of Laguna Hills | | Very High Fire Hazard Severity Zone in State Responsibility Area |
| | Other Incorporated Area | | Critical Facility |
| | Local Responsibility Area | | Facility of Concern |
| | State Responsibility Area | | |

CITY OF LAGUNA HILLS LOCAL HAZARD MITIGATION PLAN

Figure 4-10. Fire Hazard Severity Zones

Sources: Orange County GIS; City of Laguna Hills; USGS NHD;
CalFire; Office of the State Fire Marshal. Map date: March 9, 2022.

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Legend

- | | | | |
|--|--------------------------|--|---------------------|
| | City of Laguna Hills | | Critical Facility |
| | Other Incorporated Area | | Facility of Concern |
| | Wildland-Urban Interface | | |

CITY OF LAGUNA HILLS
LOCAL HAZARD MITIGATION PLAN

Figure 4-11. Wildland-Urban Interface

Sources: Orange County GIS; City of Laguna Hills; USGS NHD; The 1990-2010 wildland-urban interface of the conterminous United States - geospatial data, Forest Service Research Data Archive, 2017. Map date: March 9, 2022.

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Laguna Hills Local Hazard Mitigation Plan

Fire protection challenges within Laguna Hills occur where development is located within and directly adjacent to wildland urban interface areas. As the number of structural features increase, so does the risk of incidence of fire. Wildfires are not measured on a specific scale and are usually classified by size or impact. The size and severity of any fire depends on the availability of fuel, weather conditions, and topography, although wildfires in the wildland urban interface do not need to be identified as large to be damaging. Due to the location of development adjacent to High and Very High Fire Hazard Severity Zones, there is the potential for a wildfire to spread quickly and through a large portion of the City, depending on the conditions and nature of the fire.

PREVIOUS OCCURRENCES

Historically, there have been few wildfires within and near Laguna Hills. However, the County of Orange has experienced a number of major fires. Table 4-15, *Major Wildfires in Orange County History*, identifies the most significant historical fires in Orange County dating back to 1948 in terms of the amount of acreage claimed.

TABLE 4-15: MAJOR WILDFIRES IN ORANGE COUNTY HISTORY

Name	Year	Acres Claimed
Green River	1948	53,079
Steward	1958	69,444
Paseo Grande	1967	51,075
Indian	1980	28,408
Owl	1980	18,332
Gypsum	1982	19,986
Laguna	1993	16,682
Ortega	1993	21,010
Sierra	2006	10,584
Santiago	2007	28,517
Freeway Complex	2008	30,305
Holy Fire	2018	23,136
Silverado	2020	12,465
Blue Ridge	2020	13,694

Source: County of Orange and Orange County Fire Authority, Local Hazard Mitigation Plan, December 2021.

NOTE: Major fires in Orange County are defined as burning more than 10,000 acres in total.

Although not classified as a “major fire”, in May 2022 a fire, which began as a brush fire in Aliso Woods Canyon, burned approximately 200 acres, including several homes within Laguna Niguel.



Laguna Hills Local Hazard Mitigation Plan

PROBABILITY OF FUTURE OCCURRENCES

There are no areas of Laguna Hills within Very High Fire Hazard Severity Zones. The northwest portion of the City is within a wildland-urban interface due to the City's proximity to wildland areas, however, historically, there have been few wildfires within or near Laguna Hills. Improvements in architecture, building and landscape design and maintenance, construction materials, and emergency response have helped reduce the likelihood of catastrophic urban fires. Nevertheless, residents of Laguna Hills could potentially be exposed to structural fire hazards. However, the probability of wildfires within the City is considered low.

CLIMATE CHANGE CONSIDERATIONS

The seven largest California wildfires have occurred in the past four years, including the August Complex Fire, Dixie Fire, Mendocino Complex Fire, SCU Lightning Complex Fire, Creek Fire, LNU Lightning Complex Fire, and North Complex Fire (CAL FIRE, 2022). During 2018, the Camp Fire became the deadliest wildfire in California history, killing 86 civilians and burning 153,000 acres in Butte County (CAL FIRE, 2021). Southern California experienced several severe fires in recent history, including the Blue Ridge Fire, Silverado Fire, Skirball Fire, Woolsey Fire, and the Holy Fire.

Changing weather patterns are expected to cause an increase in temperatures, as well as more frequent and intense drought conditions. As mentioned previously, the severity of a wildfire is dependent on the amount of oxygen, heat, wind, relative humidity, and fuel. Excessive heat and low humidity during the summer and fall months are likely to occur. It is possible that higher temperatures could cause local native chaparral and scrub ecosystems to change to grasslands. This would increase dry plant matter, which could cause wildfires to move more quickly or spread into developed areas of Laguna Hills.

It is well documented that regional wildfires will likely become an increased threat, which could have secondary consequences for the City. Specifically, fires located in different parts of Orange, Riverside, or San Bernardino counties can negatively impact air quality in the City. Parts of Riverside and San Bernardino County could see wildfire risk increase between 50 and 100 percent. Wildfires release smoke, ash, and other particulate matter that substantially degrade air quality (including fine particulate matter, PM_{2.5}). PM_{2.5} is particularly damaging to human health since particulate matter of this size can deeply penetrate lung tissue and affect a person's respiratory and cardiovascular systems. While poor air quality affects everyone, persons with weakened immune systems or preexisting



Laguna Hills Local Hazard Mitigation Plan

conditions, children, seniors, and persons who spend a disproportionate amount of time outside are at an increased risk to wildfire smoke. The increase in wildfire frequency and size can contribute to periods of unhealthy to hazardous air quality, which leads to respiratory health impacts and worsens health impacts in persons with preexisting health conditions.

4.3 VULNERABILITY/RISK ASSESSMENT

Vulnerability describes how exposed or susceptible to damage an asset is, and depends on an asset's construction, condition, contents, and economic value of functions. A vulnerability analysis predicts the extent of damage on the built environment that may result from a hazard event of a given intensity in a specific area.

METHODOLOGY

For each of the hazards profiled in the previous section, a vulnerability/risk assessment is provided. The vulnerability/risk assessment gives equal weight to all hazards, regardless of the hazards' probability. It should be noted that the actual losses will depend on the type, location, magnitude, and extent of the hazard event.

This assessment considers the physical threat to the critical facilities, as well as the physical threat to residential and non-residential structures. The threat to residential and non-residential structures is considered cumulatively; individual residences and non-residential buildings are not specifically identified. Similarly, the social threat to residents is generally discussed, as specific data pertaining to vulnerable populations is not readily available at this level of analysis. However, a hazard event may have different impacts on different people. Age, socioeconomic status, access to services, physical and mental conditions, and other conditions affect the ability to prepare for and respond to a hazard event. Senior citizens and those with disabilities are more likely to need assistance during and after a hazard event due to physical and/or mental disabilities, lower income levels, and reduced mobility/accessibility to services and resources. Disabled persons may experience difficulties living independently and as a result rely on the assistance of others to prepare for and mitigate hazard conditions. Lower-income households are less likely to have the financial resources to implement mitigation actions in their homes, and less likely to have the financial means to recover as a result of a hazard event. Due to the dynamic nature of hazards, the extent of impact can vary greatly. The assessment provides an overview and understanding of the risks and vulnerabilities associated with the hazards and serves as a basis for the mitigation actions.



Laguna Hills Local Hazard Mitigation Plan

CRITICAL FACILITIES AND FACILITIES OF CONCERN

The LHMP Planning Team identified 33 critical facilities and facilities of concern for incorporation in the hazard vulnerability/risk analysis; refer to Table 4-16 and Figure 4-12, *Laguna Hills Critical Facilities and Facilities of Concern*. Critical facilities and facilities of concern are owned, operated, and maintained by various agencies, not just the City. Critical facilities serve an important function in the operations of the municipal government and in serving the community. These facilities include government buildings, community buildings, fire stations, hospitals, public schools, water and wastewater infrastructure, and transportation infrastructure. Damage to these facilities caused by a hazard event has the potential to impair response and recovery and may lead to disruption of services. Facilities of concern are less vital to safety and well-being, but may assist in evacuations, serve as assembly points or temporary shelters, or provide a supportive role in preparing for and recovering from hazard events.

Where available, the LHMP Planning Team identified a facility's potential loss value, comprised of replacement and contents for each facility. The data was provided by the City's property insurance schedule and therefore, information for facilities not owned by the City are not shown (e.g. water/wastewater infrastructure, private buildings). In some instances, replacement cost information was not made available. If a facility is completely destroyed in a hazard event, the replacement and contents values indicate the cost to replace the entire facility and all of its contents. Typically, the cost to repair a damaged facility would be less than the replacement value. While the replacement and contents values are used throughout this plan to estimate potential losses, it is noted that the actual cost to recover from a hazard event will depend on the type and magnitude of the event.

The critical facilities were mapped in GIS and overlaid with mapped hazard areas (those hazards that have a specific geographic area) to determine which assets are located in each hazard area. Hazard areas and critical facility overlays were conducted for dam inundation, flood, seismic ground shaking, landslide (specific to seismic conditions), liquefaction, and wildfires.

Due to the nature of the hazards and availability of information, hazard overlays were not prepared for drought, human-induced hazards, landslide/mudflow, severe weather, and urban fires. These hazards are not geographically defined and have the potential to affect the entire community. There are no defined hazard areas for moisture-induced landslides and mudflows, although as discussed in the hazard profile, they typically occur along hillside areas and can result from conditions caused by other hazards, such as



Laguna Hills Local Hazard Mitigation Plan

heavy rains following wildfires. For the purposes of this LHMP, it is assumed these hazards could potentially impact the entire community, including the critical facilities.

Replacement and contents values for the facilities in each hazard area are provided to estimate the potential losses based on the method described above. However, the likelihood that all facilities are completely damaged at the same time or that the entirety of a structure and its contents are damaged is extremely unlikely. Most impacts are anticipated to be isolated to certain locations based on the hazard.

TABLE 4-16: LAGUNA HILLS CRITICAL FACILITIES AND FACILITIES OF CONCERN

Map ID	Name	Type	Owner/ Responsible Agency	Location	Critical Facility	Facility of Concern
Buildings						
1	Laguna Hills City Hall/Civic Center (City Hall, Police)	Government	City	24035 El Toro Road, Laguna Hills	X	
2	Laguna Hills Community Center & Sports Complex	Community	City	25555 Alicia Parkway, Laguna Hills	X	
3	Florence Sylvester Memorial Senior Center	Community	Age Well Senior Services Inc.	23721 Moulton Parkway, Laguna Hills		X
4	Laguna Hills Technology Library	Government	County of Orange	25555 Alicia Parkway, Laguna Hills	X	
5	OCFA Station 22	Fire Station	OCFA	24001 Paseo de Valencia, Laguna Woods	X	
6	Memorial Care Saddleback Medical Center	Hospital	Private Memorial Care	24451 Health Center Drive, Laguna Hills	X	
7	Laguna Hills Transportation Center	Transportation	OCTA	24282 Calle de Los Caballeros, Laguna Hills		X
8	Laguna Hills High School	Public School	SVUSD	25401 Paseo de Valencia, Laguna Hills		X
9	MNWD Headquarters	Water/ Wastewater Headquarters	MNWD	26161 Gordon Road, Laguna Hills	X	



Laguna Hills Local Hazard Mitigation Plan

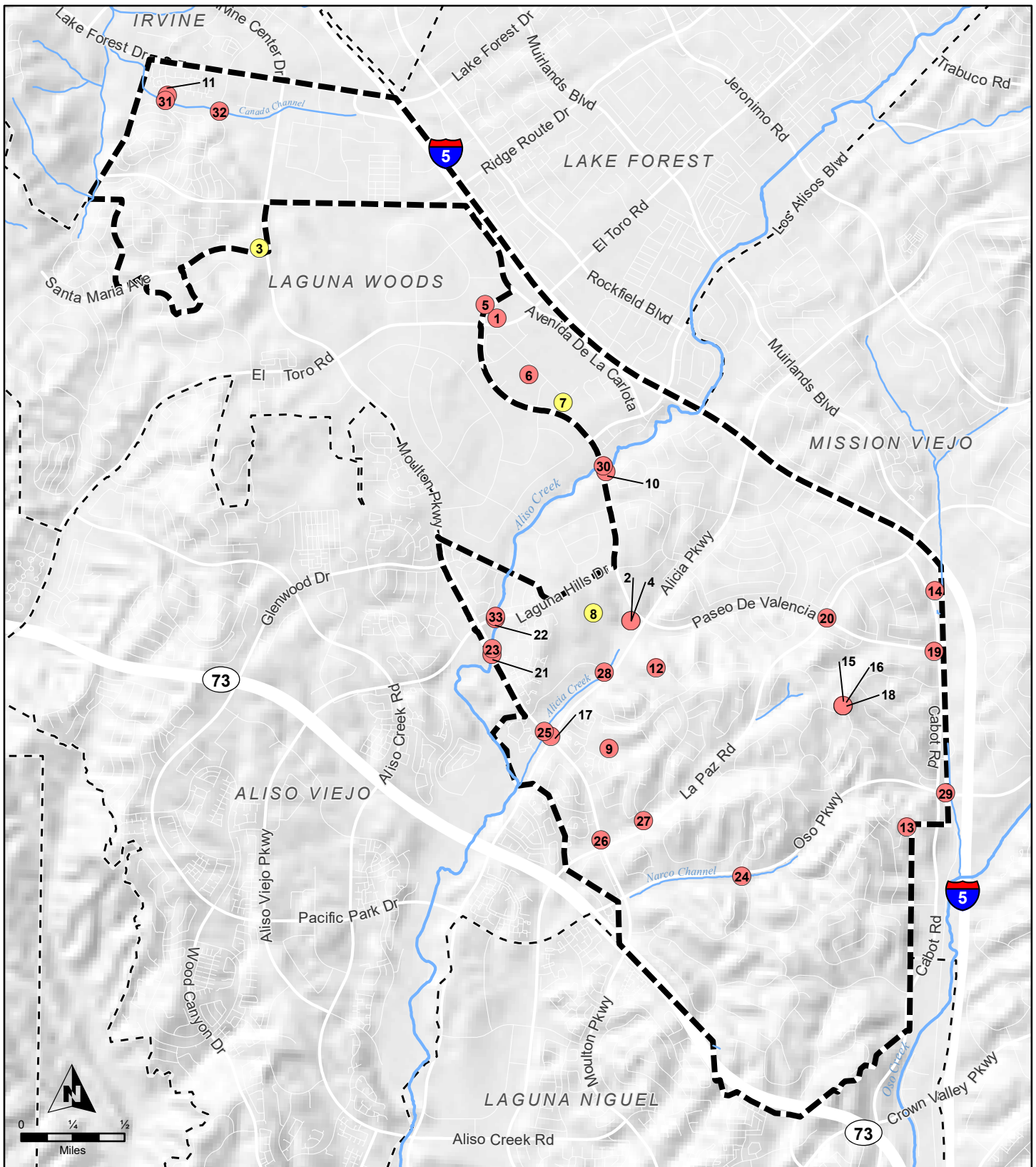
Map ID	Name	Type	Owner/ Responsible Agency	Location	Critical Facility	Facility of Concern
Water/Wastewater Infrastructure						
10	Mathis Lift Station	Sewer	ETWD	24853 Paseo de Valencia, Laguna Hills	X	
11	Veesh Lift Station	Sewer	ETWD	22988 Santa Vittoria Drive, Laguna Hills	X	
12	Aliso Hills Reservoir	Water	MNWD	24773 Mendocino Court	X	
13	Casa De Oso Pump Station	Water	MNWD	26593 Meadow Crest Drive	X	
14	La Paz Underground Pump Station	Water	MNWD	25322 ½ Cabot Road	X	
15	Mathis Pump Station	Water	MNWD	25655 Nellie Gail Lane	X	
16	Mathis Reservoir 1 & 2	Water	MNWD	25655 Nellie Gail Lane	X	
17	Moulton Lift Station 1 & 2	Sewer	MNWD	26112 Moulton Parkway	X	
18	Nellie Gail Reservoir	Water	MNWD	25655 Nellie Gail Lane	X	
19	Valencia Lift Station	Sewer	MNWD	25659 Cabot Road	X	
20	Valencia Pump Station 1 & 2	Water	MNWD	25480 La Paz Road	X	
Transportation Infrastructure						
21	Aliso Creek Bridge (55C0221L)	Transportation	City	S/B Moulton Parkway; 1.5 mile south of El Toro Road	X	
22	Aliso Creek Bridge (55C0529R)	Transportation	City	E/B Laguna Hills Drive; 400 feet east of Moulton Parkway	X	
23	Aliso Creek (55C0221R)	Transportation	City	N/B Moulton Parkway; 1.5 mile south of El Toro Road	X	
24	Narco Channel (55C0495)	Transportation	City	Nellie Gail Road; 0.1 mile south of Oso Parkway	X	
25	Alicia Creek (55C0237)	Transportation	City	Moulton Parkway; 200 feet northwest	X	



Laguna Hills Local Hazard Mitigation Plan

Map ID	Name	Type	Owner/ Responsible Agency	Location	Critical Facility	Facility of Concern
				of Alicia Parkway		
26	Aliso Hills Creek Equestrian (55C0238)	Transportation	City	Moulton Parkway; 200 feet north of La Paz Road	X	
27	La Paz Equestrian (55C0239)	Transportation	City	La Paz Road; 0.2 mile northeast of Moulton Parkway	X	
28	Via Lomas (55C0662)	Transportation	City	Via Lomas; 100 feet west of Alicia Parkway	X	
29	Oso Parkway (55C0056)	Transportation	Caltrans	Oso Parkway; 0.1 mile west of Route I-5	X	
30	Aliso Creek (55C0220)	Transportation	City	Paseo De Valencia; 0.8 mile north of Alicia Parkway	X	
31	Canada Channel (55C0191)	Transportation	City	Santa Vittoria Drive; 0.2 mile south of Lake Forest Drive	X	
32	Canada Channel (55C0549)	Transportation	City	Mill Creek Drive; 0.2 mile south of Lake Forest Drive	X	
33	Aliso Creek (55C0529L)	Transportation	City	W/B Laguna Hills Drive; 400 feet east of Moulton Parkway	X	

Source: City of Laguna Hills, 2022.



Legend

- City of Laguna Hills
- Other Incorporated Area
- Critical Facility
- Facility of Concern

**CITY OF LAGUNA HILLS
LOCAL HAZARD MITIGATION PLAN**

Figure 4-12. Critical Facilities and Facilities of Concern



Laguna Hills Local Hazard Mitigation Plan

VULNERABILITY ASSESSMENT

DAM/RESERVOIR FAILURE

The portions of the City located within a dam inundation area are generally limited to the northernmost portion of the City in the area south of Lake Forest Drive and Irvine Center Drive, and a small area along the eastern boundary of the City, adjacent to the I-5 Freeway. There are no critical structures (buildings) located within a dam inundation area. As shown in Table 4-17, *Critical Facilities in a Dam Inundation Areas*, three critical facilities are located with dam inundation areas. These include the Canada Channel bridge, which spans Canada Channel and a sewer lift station.

TABLE 4-17: CRITICAL FACILITIES IN A DAM INUNDATION AREAS

Map #	Facility	Type	Owner/Responsible Agency	Total Loss Potential
Critical Facilities				
19	Valencia Lift Station	Sewer	MNWD	\$5,000,000 ¹
31	Canada Channel (55C0191)	Transportation	City	
32	Canada Channel (55C0549)	Transportation	City	

Note: Total Loss Potential includes estimated replacement and content values, if applicable. If not provided, values are not currently available.

1. Orange County Regional Water and Wastewater Multi-Jurisdictional Hazard Mitigation Plan, August 2019.

Within the inundation areas, vulnerable populations, such as senior citizens and those with disabilities who may need assistance to evacuate the area or those with limited income and resources may experience greater difficulties in the event they need to leave the area for an extended period.

DROUGHT

Drought conditions would affect the entirety of Laguna Hills; therefore, all critical facilities and facilities of concern, businesses, and residents within the City are considered vulnerable to drought hazards. Droughts do not typically result in physical damage to buildings and infrastructure, thus critical facilities and facilities of concern are not at risk of destruction or structural failure.

Prolonged drought conditions often result in strict conservation measures, such as targeted reduction percentages or penalties for using potable water above a specific threshold. Higher rates or penalties could disproportionately impact lower-income households or residents on a fixed income. MNWD and ETWD are required to prepare and adopt Water Shortage Contingency Plans (WSCP) to prepare for and respond to



Laguna Hills Local Hazard Mitigation Plan

water shortages. A water shortage, when water supply available is insufficient to meet the normally expected customer water use at a given point in time, may occur due to a number of reasons, such as drought, climate change, and catastrophic events. The WSCP serves as an operating manual to prevent catastrophic service disruptions through proactive, rather than reactive, management.

Prolonged drought conditions can also cause impacts to the environment, resulting in dead or dried vegetation, dry soils, damage to wildlife habitat, and degradation of landscape quality. These conditions can increase the vulnerability of other hazards within the community, such as wildfires.

FLOOD

FEMA-identified flood zones within Laguna Hills are primarily located within and adjacent to creeks and channels traversing the City. As shown in Table 4-18, *Critical Facilities in a 100-Year Flood Hazard Zone*, there are no critical buildings located within the 100-year floodplain. With the exception of sewer lift stations, the critical facilities consist of transportation facilities – bridges that span creeks and channels and provide access to various areas of the City.

TABLE 4-18: CRITICAL FACILITIES IN A 100-YEAR FLOOD HAZARD ZONE

Map #	Facility	Type	Owner/Responsible Agency	Total Loss Potential
Critical Facilities				
10	Mathis Lift Station	Sewer	ETWD	\$5,000,000 ¹
17	Moulton Lift Station 1 & 2	Sewer	MNWD	\$5,000,000 ¹
21	Aliso Creek Bridge (55C0221L)	Transportation	City	
22	Aliso Creek Bridge (55C0529R)	Transportation	City	
25	Alicia Creek (55C0237)	Transportation	City	
28	Via Lomas (55C0662)	Transportation	City	
30	Aliso Creek (55C0220)	Transportation	City	
31	Canada Channel (55C0191)	Transportation	City	
32	Canada Channel (55C0549)	Transportation	City	
33	Aliso Creek (55C0529L)	Transportation	City	

Note: Total Loss Potential includes estimated replacement and content values, if applicable. If not provided, values are not currently available.

1. Orange County Regional Water and Wastewater Multi-Jurisdictional Hazard Mitigation Plan, August 2019.

A significant flood resulting in damage to critical transportation facilities could interfere with the ability to evacuate specific areas of the community or to provide emergency response and equipment to an area. Similarly, localized flooding of roadways can strand motorists and hinder access to and from an area. Residents with mobility challenges and



Laguna Hills Local Hazard Mitigation Plan

those without access to transportation may have difficulty evacuating from a flood event. Because the flood zones occur within and around the creeks, a flood could also result in debris flow downstream. Flooding of lift stations could result in the loss of power and the potential for system backups and untreated wastewater to spill out into adjacent areas. A spill requires immediate clean-up response to protect public health and prevent further contamination. Localized flooding could damage homes and businesses resulting in reduced economic activity and loss of use until repair work can be completed.

Repetitive Loss and Severe Repetitive Loss

Addressing risk to repetitive loss and severe repetitive loss structures is an important step in reducing the financial impact of flooding as repetitive losses require extensive disaster management resources and high NFIP claims.

FEMA defines a repetitive loss as any NFIP-insured structure that has had at least two (2) paid flood losses of more than \$1,000 each in any 10-year period since 1978. FEMA defines a severe repetitive loss as any NFIP-insured structure that has met one of the following paid flood loss criteria since 1978:

- Four (4) or more separate claim payments of more than \$5,000 each (Including building and contents payments); or
- Two (2) or more separate claim payments (building payments only) where the total of the payments exceeds the current value of the property.

The City of Laguna Hills does not have any repetitive loss or severe repetitive loss properties.

HUMAN-INDUCED HAZARDS

Human-induced hazards have the potential to affect the entirety of Laguna Hills; therefore all critical facilities and facilities of concern, business, and residents within the area are considered vulnerable to human-induced hazards. Hazardous materials spills could occur along a transportation corridor or at a specific property. Although hazardous materials could result in damages to structures, it is more likely that a hazardous material spill would result in potential health hazards or closure of roadways or areas within the community surrounding the spill. Generally, sites that are closer to the origin for the release of the hazardous materials are more at threat than those that are further away. Residents living next to major transportation infrastructure, such as highways or major arterial streets, have a greater threat of being affected by a hazardous materials release



Laguna Hills Local Hazard Mitigation Plan

since trucks or vehicles carrying quantities of hazardous materials may release their contents into the environment if the vehicle is involved in a collision.

It is not likely that cyber threats would have a direct physical impact on a critical facility or facility of concern. Cyber threats would be more likely involve computer network infrastructure and could interfere with business operations; although individual residents may also experience cyber threats. Service and operations could be impacted in the event of a cyber-attack.

SEISMIC AND GEOLOGIC HAZARDS

The entire City of Laguna Hills is at risk of experiencing strong ground shaking as a result of an earthquake. During a seismic event, critical facilities and facilities of concern as well as residences, businesses, and infrastructure could be damaged. The extent of damage would depend upon the location and magnitude of the earthquake. Depending upon the damage, emergency services, communication systems, and utility services may all be hindered. Senior citizens and those with disabilities that limit mobility may be harmed if they are unable to react quickly and seek out areas of safety from falling debris. Further, extended interruptions in services, including power outages, would disproportionately affect people with medical conditions requiring power for medical equipment. Depending upon the extent of damage, businesses could be closed and experience economic losses. Residents could also be displaced if damage to their homes is extensive.

Portions of the City are also at risk for seismic-induced landslides and liquefaction. Table 4-19, *Critical Facilities in a Landslide Zone* and Table 4-20, *Critical Facilities in a Liquefaction Zone*, identify the critical facilities located within landslide and liquefaction zones, respectively.

TABLE 4-19: CRITICAL FACILITIES IN A LANDSLIDE ZONE

Map #	Facility	Type	Owner/Responsible Agency	Total Loss Potential
Critical Facilities				
29	Oso Parkway (55C0056)	Transportation	Caltrans	Not Available

Note: Total Loss Potential includes estimated replacement and content values, if applicable. If not provided, values are not currently available.



Laguna Hills Local Hazard Mitigation Plan

TABLE 4-20: CRITICAL FACILITIES IN A LIQUEFACTION ZONE

Map #	Facility	Type	Owner/Responsible Agency	Total Loss Potential
Critical Facilities				
9	MNWD Headquarters	Water/Wastewater Headquarters	MNWD	
11	Veeh Lift Station	Sewer	ETWD	\$5,000,000 ¹
17	Moulton Lift Station 1 & 2	Sewer	MNWD	\$5,000,000 ¹
21	Aliso Creek Bridge (55C0221L)	Transportation	City	
22	Aliso Creek Bridge (55C0529R)	Transportation	City	
23	Aliso Creek (55C0221R)		City	
25	Alicia Creek (55C0237)	Transportation	City	
26	Aliso Hills Creek Equestrian (55C0238)	Transportation	City	
27	La Paz Equestrian (55C0239)	Transportation	City	
28	Via Lomas (55C0662)	Transportation	City	
30	Aliso Creek (55C0220)	Transportation	City	
31	Canada Channel (55C0191)	Transportation	City	
32	Canada Channel (55C0549)	Transportation	City	
33	Aliso Creek (55C0529L)	Transportation	City	
Facilities of Concern				
7	Laguna Hills Transportation Center	Transportation	OCTA	

Note: Total Loss Potential includes estimated replacement and content values, if applicable. If not provided, values are not currently available.

1. Orange County Regional Water and Wastewater Multi-Jurisdictional Hazard Mitigation Plan, August 2019.

Landslides can damage structures and block roadways causing long-term disruptions to the roadway network, infrastructure systems and City capabilities. Underground utility lines in slide-prone areas can be damaged in a landslide, causing service outages. Liquefaction can also damage buildings and infrastructure, including pipelines within soils subject to liquefaction. Damage to transportation infrastructure can impede access and hinder emergency response and evacuation. Damaged utilities can result in service interruptions or complete outages. Lower income households, those on fixed incomes, and those with mobility challenges or no access to transportation may have difficulty evacuating an area and may have more difficulty in the event of displacement. Construction within the City has taken geologic conditions, including landslide- and liquefaction-susceptibility into consideration.



Laguna Hills Local Hazard Mitigation Plan

SEVERE WEATHER

A severe weather event, such as heavy rains, Santa Ana winds, and extreme heat conditions, could affect the entire City of Laguna Hills; therefore all critical facilities and facilities of concern, business, and residents within the area are considered vulnerable to severe weather hazards. Heavy rain can damage structures if the roof is compromised or drainage systems overflow and cause flooding. Landslides, slope instability, and mudflows can also occur along slopes and along creeks and channels. Flooding of roadways can also occur, stranding vehicles and limiting emergency access and response. Santa Ana wind events can damage structures, particularly from falling trees or branches or potential debris that is carried by the wind. Extreme heat events do not typically result in damage to structures. However, these events can place greater demand on the power system and result in power outages that can impact residents and businesses. Young children, the elderly, or people suffering from serious medical conditions are physiologically more vulnerable to heatstroke. People requiring the use of medical equipment with a power source could be impacted. Additionally, people experiencing homelessness are also at higher risk of health complications during an extreme heat event. Lower-income households or those with limited mobility may be unable to acquire or seek out cooling devices without significant advance preparations. This can be further compounded by the threat of Public Safety Power Shutoff events. During these events, extreme heat impacts may affect larger portions of the City and populations that wouldn't be viewed as vulnerable under normal circumstances.

WILDFIRE AND URBAN FIRES

The City is not located within very high or high fire hazard zones. However, portions of the City are located adjacent to fire hazard zones and are identified as within a wildland-urban interface (WUI). Table 4-21, *Critical Facilities in Wildland-Urban Interface*, identifies those facilities located within these areas. Typically, the WUI is impacted if adequate fuels are combined with dry conditions and strong winds.



Laguna Hills Local Hazard Mitigation Plan

TABLE 4-21: CRITICAL FACILITIES IN WILDLAND-URBAN INTERFACE

Map #	Facility	Type	Owner/Responsible Agency	Total Loss Potential
Critical Facilities				
11	Veeh Lift Station	Sewer	ETWD	\$5,000,000 ¹
31	Canada Channel (55C0191)	Transportation	City	
Facilities of Concern				
3	Florence Sylvester Memorial Senior Center	Community	Age Well Services, Inc.	

Note: Total Loss Potential includes estimated replacement and content values, if applicable. If not provided, values are not currently available.

1. Orange County Regional Water and Wastewater Multi-Jurisdictional Hazard Mitigation Plan, August 2019.

Wildfires can impact structures and also impact people, especially in the event of an evacuation. Seniors and persons with disabilities may have limited mobility and therefore evacuation may be a greater challenge. Persons with disabilities may require special mobility devices or caregiver assistance to evacuate. Other groups with increased threat levels include people with lower-incomes, renters, and the homeless. These groups may not possess enough financial resources to rebuild their homes or search for new homes in the event of evacuation or damage resulting from a wildfire.

Depending upon the location and extent of the fire, transportation routes could be impaired or inaccessible, which could impede evacuation and hinder emergency response. Evacuation and shelter areas may not be available to evacuees depending upon the location of the wildfire. Wildfires within the area, even if not within the City can also impact people's health due to the poor air quality. Senior citizens, youth, and people with preexisting medical conditions are most at risk. Utility systems could be damaged or interrupted. Controlled and proactive power outages are highly likely during a wildfire event to reduce the risk for additional fires to be initiated. These power outages can extend beyond the area of the fire.

SUMMARY OF VULNERABILITY

Table 4-22, *Risk Assessment Summary*, shows a summary of critical facilities and facilities of concern that intersect with hazard areas in the City. Those facilities that intersect with a hazard area are indicated with a "Y" and a red-shaded cell. Critical facilities and facilities of concern that do not fall within the hazard area are designated with an "N" and a green-shaded cell. The risks of drought, human-induced hazards, ground shaking, and severe weather are considered to have the potential to impact the entire community.



Laguna Hills Local Hazard Mitigation Plan

TABLE 4-22: RISK ASSESSMENT SUMMARY

Map ID	Name	Dam/ Reservoir Failure	Drought	Flood	Human-Induced Hazards	Ground Shaking	Landslides	Liquefaction	Severe Weather	Wildland-Urban Interface
Critical Facilities										
1	Laguna Hills City Hall/Civic Center (City Hall, Police)	N	Y	N	Y	Y	N	N	Y	N
2	Laguna Hills Community Center & Sports Complex	N	Y	N	Y	Y	N	N	Y	N
3	Florence Sylvester Memorial Senior Center	N	Y	N	Y	Y	N	N	Y	Y
5	OCFA Station 22	N	Y	N	Y	Y	N	N	Y	N
6	Memorial Care Saddleback Medical Center	N	Y	N	Y	Y	N	N	Y	N
10	Mathis Lift Station	N	Y	Y	Y	Y	N	N	Y	N
11	Veeh Lift Station	N	Y	N	Y	Y	N	Y	Y	Y
12	Aliso Hills Reservoir	N	Y	N	Y	Y	N	N	Y	N
13	Casa De Oso Pump Station	N	Y	N	Y	Y	N	N	Y	N
14	La Paz Underground Pump Station	N	Y	N	Y	Y	N	N	Y	N
15	Mathis Pump Station	N	Y	N	Y	Y	N	N	Y	N
16	Mathis Reservoir 1 & 2	N	Y	N	Y	Y	N	N	Y	N
17	Moulton Lift Station 1 & 2	N	Y	Y	Y	Y	N	Y	Y	N
18	Nellie Gail Reservoir	N	Y	N	Y	Y	N	N	Y	N
19	Valencia Lift Station	Y	Y	N	Y	Y	N	N	Y	N
20	Valencia Pump Station 1 & 2	N	Y	N	Y	Y	N	N	Y	N
21	Aliso Creek Bridge (55C0221L)	N	Y	Y	Y	Y	N	Y	Y	N
22	Aliso Creek Bridge (55C0529R)	N	Y	Y	Y	Y	N	Y	Y	N
23	Aliso Creek (55C0221R)	N	Y	N	Y	Y	N	Y	Y	N
24	Narco Channel (55C0495)	N	Y	N	Y	Y	N	N	Y	N
25	Alicia Creek (55C0237)	N	Y	Y	Y	Y	N	Y	Y	N
26	Aliso Hills Creek Equestrian (55C0238)	N	Y	N	Y	Y	N	Y	Y	N
27	La Paz Equestrian (55C0239)	N	Y	N	Y	Y	N	Y	Y	N
28	Via Lomas (55C0662)	N	Y	Y	Y	Y	N	Y	Y	N
29	Oso Parkway (55C0056)	N	Y	N	Y	Y	Y	N	Y	N
30	Aliso Creek (55C0220)	N	Y	Y	Y	Y	N	Y	Y	N
31	Canada Channel (55C0191)	Y	Y	Y	Y	Y	N	Y	Y	Y
32	Canada Channel (55C0549)	Y	Y	Y	Y	Y	N	Y	Y	N
33	Aliso Creek (55C0529L)	N	Y	Y	Y	Y	N	Y	Y	N



Laguna Hills Local Hazard Mitigation Plan

Map ID	Name	Dam/ Reservoir Failure	Drought	Flood	Human-Induced Hazards	Ground Shaking	Landslides	Liquefaction	Severe Weather	Wildland-Urban Interface
Facilities of Concern										
4	Laguna Hills Technology Library	N	Y	N	Y	Y	N	N	Y	N
7	Laguna Hills Transportation Center	N	Y	N	Y	Y	N	Y	Y	N
8	Laguna Hills High School	N	Y	N	Y	Y	N	N	Y	N
9	MNWD Headquarters	N	Y	N	Y	Y	N	Y	Y	N



Laguna Hills Local Hazard Mitigation Plan

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Section 5.0 | Hazard Mitigation Strategy

Hazard mitigation strategies are used to reduce hazard impacts on residents, public infrastructure, and critical facilities. The hazard mitigation actions will help to protect the safety and well-being of residents and visitors, critical facilities, facilities of concern, other buildings and structures, key services, the local economy, and other important community assets. Some actions will also help with emergency preparedness, allowing for a more effective community response to hazard events. Preparedness actions are not a required component of an LHMP, but they support and complement mitigation activities, and the Planning Team chose to include them as part of the overall hazard mitigation strategy.

This section of the LHMP is derived from an in-depth review of the vulnerabilities and capabilities described in this plan. Overall, the actions represent the City's risk-based approach for reducing and/or eliminating the potential losses as identified in the Risk and Vulnerability Assessment section.

5.1 CAPABILITIES ASSESSMENT

As part of the effort to identify mitigation actions, a capabilities assessment was prepared. This capabilities assessment is designed to identify existing personnel, planning tools, public policy and programs, technology, and funds that have the capability to support hazard mitigation activities and strategies outlined in this plan. To create this capability assessment, the Planning Team identified capabilities and mechanisms available to the City and partner agencies for reducing damage from future hazard events. The capabilities were reviewed in the context of developing the mitigation actions.

The capabilities assessment considered the following types of resources:

- Planning and regulatory capabilities are based on the implementation of ordinances, policies, local laws and State statutes, and plans and programs that relate to guiding and managing growth and development.
- Administrative and technical capabilities refer to the community's staff and their skills and tools that can be used for mitigation planning and to implement specific



Laguna Hills Local Hazard Mitigation Plan

mitigation actions. It also refers to the ability to access and coordinate these resources effectively.

- Financial capabilities are the resources that a jurisdiction has access to or is eligible to use to fund mitigation actions.
- Education and outreach capabilities are programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Table 5-1, *Capabilities Assessment*, summarizes the capabilities assessment for Laguna Hills.

TABLE 5-1: CAPABILITIES ASSESSMENT

Resources	Description of Ability to Support Mitigation
Planning & Regulatory	
General Plan Responsible Department: City of Laguna Hills Community Development Department, Planning Division	The Laguna Hills General Plan establishes the overall vision for future growth and development. As a blueprint for the future, the plan contains policies and programs designed to provide a solid basis for decisions related to land use and development. The General Plan provides the framework for the implementation of the LHMP mitigation actions. The Safety Element identifies hazards that could impact the community and establishes policy for the preparation and update of the LHMP. The City has incorporated by reference the City of Laguna Hills Local Hazard Mitigation Plan into its General Plan Safety Element to ensure compliance with AB 2140, making the City eligible for additional funding under the California Disaster Assistance Act (CDAA). As future General Plan Updates occur, hazard information will be updated to reflect current conditions, including updated mapping and assessments of hazards to be considered when determining the placement and development of land uses.
Zoning Ordinance Responsible Department: Community Development Department	The Laguna Hills Zoning Code implements the General Plan by establishing regulations for land use control within the City, including where and how development occurs. Zoning is used to protect the public health, safety and welfare of a community. The City can use the Zoning Code to implement mitigation actions to reduce risks associated with future development. The Zoning Ordinance is incorporated into Municipal Code as Title 9.
Subdivision Ordinance Responsible Department: Community Development Department	The City's subdivision ordinance regulates development of housing, commercial, industrial or other uses, including associated public infrastructure, as land is subdivided into buildable lots. The subdivision ordinance can ensure future subdivisions account for the risk of hazards on future development. The Subdivision Ordinance is included as Chapter 9-86 of the City Municipal Code.



Laguna Hills Local Hazard Mitigation Plan

Resources	Description of Ability to Support Mitigation
Building Code Responsible Department: Community Development Department	The Building Code regulates how buildings are constructed. The City adopts the State Building Code with amendments, as applicable. Mitigation actions to construct buildings to safer standards to better resist damage during a hazard event could be considered as part of future building code updates. The Building Code is incorporated as Chapter 10-28 of the Municipal Code.
National Flood Insurance Program Responsible Department: Community Development Department	The National Flood Insurance Program (NFIP) provides affordable flood insurance to property owners, renters and businesses by encouraging communities to adopt and enforce floodplain management regulations. The City of Laguna Hills participates in the NFIP. The City complies with floodplain regulations and utilizes this information as development is proposed.
Capital Improvement Program Responsible Department: Public Works	The Capital Improvement Program (CIP) is established to provide for the planning, funding, design, construction, maintenance and repair of City facilities and infrastructure. The CIP is a "roadmap" that provides direction and guidance to the City to carefully plan and manage its capital and infrastructure assets. Typical improvement and maintenance projects included within the CIP include streets, signals, and lighting; flood control and water quality; parks; and public facilities. The City can use the CIP to identify priority projects for hazard mitigation.
OC Stormwater Program Responsible Agency: County of Orange, Orange County Flood Control District	The OC Stormwater Program is designed to avoid flooding associated with stormwater runoff. It focuses on design and construction measures that are intended to reduce the impact of frequent urban nuisance flooding. The program includes mitigation actions to address flooding associated with hazard events.
City of Laguna Hills Local Implementation Plan (Jurisdictional Runoff Management Plan) Responsible Department: Public Services	This plan addresses the impacts to creeks, rivers, streams, and coastal waters that can arise from the imprint of urban development on the landscape. This plan describes the activities that the City is undertaking to meet the requirements of the Fifth Term Permit and to protect and improve the quality of the creeks, streams, and coastal waters within the urban areas of the San Juan Hydrologic Unit, also referred to as the South Orange County Watershed Management Area (WMA) to which the City contributes runoff.
Urban Water Management Plan Responsible Agencies: Moulton Niguel Water District (MNWD) & El Toro Water District (ETWD)	MNWD and ETWD prepare Urban Water Management Plans (UWMP) every five years. An UWMP provides long-term resource planning to ensure that adequate water supplies are available to meet existing and future water needs. UWMP addresses drought conditions and the ability to provide water to its customers. The UWMP can be used to coordinate and implement mitigation actions associated with drought and water supply reliability.



Laguna Hills Local Hazard Mitigation Plan

Resources	Description of Ability to Support Mitigation
Integrated Regional Water Management Plan for South Orange County	The South Orange County Integrated Regional Water Management Plan (IRWMP) has been developed from, and coordinates with, existing plans and research documents provided by the participating agencies in a manner that identifies and integrates regional projects to improve water supply, protect water quality, enhance the environment, and provide flood risk management. This Plan establishes a priority ranking to help further regional efforts to investigate the feasibility of, and identify funding for, these projects. Individual projects, however will go through the appropriate environmental review and permitting process as funding is secured. The IRWMP can be used to coordinate and implement mitigation actions associated with drought and water supply reliability.
Mutual Aid Agreements Responsible Agencies: City of Laguna Hills, Orange County Fire Authority (OCFA), Orange County Sheriff's Department (OCSD)	The City and its public safety providers maintain agreements with emergency responders to lend assistance across jurisdictional boundaries when an emergency response exceeds local resources. Access to these resources provides opportunities to implement mitigation actions to reduce damage and risk of injury during an event. It also provides for collaboration and sharing of information specific to hazards. • Fire – Federal, State, and local agreements • Police – State and local agreements • City – State and county agreements
Orange County Emergency Operations Center Responsible Agency: County of Orange	The Orange County Emergency Operations Center (EOC) functions as the communication and coordination center for both the County and Operational Area emergency response organization and disaster preparedness, providing a central point for coordinating operational, administrative, and support needs of the county and Operational Area Members. It also assists in coordination and communication between Mutual Aid Coordinators and the State Office of Emergency Services during county-wide and State-wide emergency response and recovery operations. The OC EOC can be used to gather and process information to and from the County, cities, school and special districts, business and industry, volunteer organizations, individuals, and State and federal government agencies. It has the ability to function as a virtual EOC so that Operational Area Members may communicate between EOCs without co-location. WebEOC is a crisis information management system and provides secure real-time information sharing. Accurate and timely communication is critical during a hazard event and can reduce more significant damage and injury. Mitigation actions specific to communications and information can be implemented through the communication systems and response efforts to reduce risk of injury and damage.



Laguna Hills Local Hazard Mitigation Plan

Resources	Description of Ability to Support Mitigation
2021 County of Orange & Orange County Fire Authority Hazard Mitigation Plan Responsible Agencies: County of Orange & OCFA	The 2021 County of Orange & Orange County Fire Authority Hazard Mitigation Plan establishes public policy to protect residents, critical facilities infrastructure, private property and the environment from hazards in the unincorporated areas of the County and County-owned facilities and ensure the County's continued eligibility for disaster relief funds from the Federal and State Governments.
County of Orange & Orange County Operational Area EOP: Flood, Dam, and Reservoir Failure Responsible Agencies: Orange County Emergency Management Organization (OCEMO), OCFA, OCSD,	This plan provides an overview of the threat and the existing plans, procedures and response protocols within the County and OA that would be implemented in the event of a flood, dam or reservoir failure event within Orange County. The County of Orange has constructed a vast network of flood control channels, dams, retarding basins, pump stations and monitoring equipment. Dam and Reservoir operators have in place Emergency Actions Plans (EAP) to serve as standard operating and notification procedures should an emergency occur.
County of Orange & Orange County Operational Area EOP: Joint Information System Annex Responsible Agencies: Orange County Emergency Management Organization (OCEMO), Orange County Sheriff's Department, Emergency Management Division (EMD)	This plan establishes the system by which the County and Operational Area (OA) will conduct the public information function and services during an emergency. It is meant to facilitate the collaboration required by the multiple organizations and jurisdictions that will implement the Joint Information System (JIS) and staff the Joint Information Center (JIC) to provide timely, accurate, wide-reaching and simple to understand crisis communications to both the media and the public. EMD will make the Joint Information System Annex available to all county departments, Operational Area jurisdictions, the California Office of Emergency Services (Cal OES) and other partner organizations as necessary and upon request.
County of Orange & Orange County Operational Area Local Hazard Mitigation Plan (LHMP) Responsible Agencies: Orange County Emergency Management Organization (OCEMO), OCFA	The LHMP promotes sound public policy designed to protect residents, critical facilities, infrastructure, key resources, private property, and the environment from natural hazards in unincorporated areas, fire hazards in the Fire Authority service area, and County and Fire Authority owned facilities. This LHMP is a multi-jurisdiction plan developed jointly between the County of Orange, a local government, and the Orange County Fire Authority, a Joint Powers Authority. Because of the unique relationship between the two jurisdictions, OCFA has been comprehensively integrated into the County's emergency organization.
Unified County of Orange & Orange County Operational Area Emergency Operations Plan Responsible Agencies:	The EOP provides guidance and procedures for the County and the County as the OA to prepare for and respond to natural, technological, conflict-related, and human-caused incidents creating situations requiring a coordinated response. It provides guidance for management concepts, identifies organizational structures and relationships and describes



Laguna Hills Local Hazard Mitigation Plan

Resources	Description of Ability to Support Mitigation
Orange County Sheriff's Department, Emergency Management Division (EMD)	responsibilities and functions of the emergency organization to protect life and property. The EOP is applicable to all agencies and individuals having responsibilities for emergency preparedness, response, recovery and/or mitigation in Orange County; this includes but may not be limited to the County, cities, school districts, special districts, utilities, non-government organizations, and State and Federal agencies. Each organization identified in this EOP is responsible for, and expected to develop, implement, and test policies, procedures, instructions, and standard operating guides (SOGs) or checklists that reflect cognizance of the emergency management concepts contained herein.
Orange County Regional Water and Wastewater Hazard Mitigation Plan Responsible Agencies: Orange County Water District, Municipal Water District of Orange County, individual member agencies, including ETWD and MNWD	The Hazard Mitigation Plan (HMP) provides a framework for participating water and wastewater utilities to plan for natural and man-made hazards in Orange County. The resources and information within the Plan allow participating jurisdictions, such as ETWD and MNWD, to identify and prioritize future mitigation projects, meet the requirements of federal assistance programs and grant applications, and encourage coordination and collaboration in meeting mitigation goals. The HMP gives participating agencies the opportunity to focus on risk as it applies specifically to these services and not all of their jurisdiction's services. As participating jurisdictions, ETWD and MNWD have individual annexes that describe the hazards, assess the vulnerabilities, identify the capabilities and describe mitigation strategies specific to that agency.
Orange County Fire Authority 2020 Unit Strategic Fire Plan Responsible Agency: OCFA	Orange County's Unit Strategic Fire Plan was first collaboratively developed as a planning and assessment tool in 2010, in conjunction with key stakeholders and partner organizations, with the goal of reducing total government costs and citizen losses from wildfire in Orange County. This plan addresses such topics as firefighter and public safety, Wildland Urban Interface (WUI) challenges, impactful cost-effective solutions, community preparedness, prioritization, collaborative partnerships, program, project and policy evaluation and adaptability.
Laguna Hills Urban Wildfire Interface (WUI) Fire Plan Responsible Agency: OCFA	The WUI Fire Plan provides risk assessment matrix, tactical plans, and various maps regarding fire hazard mitigation operations. Recommended strategies and tactics, and evacuation plans, for varying situations are also presented. This plan identifies how local and regional agencies are to work together to eliminate fire hazards.
Water Shortage Contingency Plan Responsible Agency: ETWD, MNWD	The Water Shortage Contingency Plan (WSCP) is a strategic planning document designed to prepare for and respond to water shortages. This plan is used to prevent catastrophic service disruptions through proactive, rather than reactive, management. This WSCP provides a structured guide for the



Laguna Hills Local Hazard Mitigation Plan

Resources	Description of Ability to Support Mitigation
	District to deal with water shortages, incorporating prescriptive information and standardized action levels, along with implementation actions in the event of a catastrophic supply interruption.
Weed Abatement Fire Reduction Program Responsible Agencies: City of Laguna Hills, OCFA	The City of Laguna Hills conducts an annual weed abatement program designed to reduce fire hazards during the summer season. The weed abatement program is done in accordance with Government Code Section 39560, et.seq., and the Orange County Fire Authority standards. Assessment and integration of the Plan can be tailored to address localized conditions, such as drought conditions and increased wildfire threat.
Wildfire Mitigation Plan Update Responsible Agencies: SCE & SDG&E	Electrical corporations are required to prepare and submit Wildfire Mitigation Plans (WMPs) to the Office of Energy Infrastructure Safety for review and approval. WMPs describe how the electrical corporation is constructing, maintaining, and operating its electrical lines and equipment in a manner that will minimize the risk of catastrophic wildfire.
Administrative & Technical	
General Government	The General Government Department consists of the legislative, executive, and administrative oversight of all City operations. All expenditures and activities related to the City Council, City Manager, City Attorney, City Clerk, and Administrative Services are included in this Department. The Department is also responsible for the City's economic development efforts.
Community Development Department	The Community Development Department provides planning, code enforcement, building and safety, and receptionist functions for the City and is organized into two divisions: Planning and Building and Safety.
Public Safety Department	Public Safety includes (in part) Emergency Management, Fire Services provided by OCFA, and Police Services provided by OCSD. Emergency Management supports citizens, first responders, and City staff in building and sustaining the City's ability to mitigate, prepare, protect, respond, and recover from the effects of natural and human-caused disasters. As a division of Police Services, staff works closely with the OCSD Emergency Management Division, OCFA, OC Health Care Agency, American Red Cross, and surrounding cities and county departments and agencies to provide preparedness and coordination during a disaster. The OCSD provides police protection services and OCFA provides fire protection services to the City. Both OCSD and OCFA also provide community programs and education campaigns. The Public Safety Department is a key component of implementing mitigation actions, including but not limited to, coordinating and communicating with the public and other agencies, ensuring



Laguna Hills Local Hazard Mitigation Plan

Resources	Description of Ability to Support Mitigation
	safe and efficient evacuations, if necessary, providing or participating in public education and preparedness activities that support mitigation of risks, reducing wildfire risks and enforcing fire-related requirements.
Public Services Department	The Public Services Department is responsible for the design, construction, and maintenance of public facilities including public streets, traffic signals, storm drains, parks, and landscaping. The Public Services Department deals with mitigation actions pertaining to public facilities, maintenance of transportation systems, maintenance of storm drain systems, maintenance and removal of tree limbs or debris.
General Government Department; Finance Division	The Finance Division of the General Government Department manages the financial operation of the City in conformity with generally accepted accounting standards and principles, and in compliance with federal and state laws. Finance is committed to developing and maintaining a proficient financial planning and reporting system, in order to provide the City Council, City Manager and other City officials with financial information on a timely and meaningful manner. The division dutifully establishes and maintains efficient and effective internal control policies and procedures to safeguard the City's assets and manage its resources.
Community Development Department; Building & Safety Division	The Building and Safety Division is responsible for the building and safety standards for the design, construction, use, and occupancy, of all buildings and structures within the City of Laguna Hills. The Building & Safety Division works closely with Planning, Engineering Services of Public Works, Orange County Fire Authority (OCFA) and other related departments to offer you the best care and services. The division issues permits and performs plan reviews and inspections for building, plumbing, mechanical, electrical, solar, and Certificate of Use and Occupancy. Our permit process helps ensure the safety of the general public and tenant occupants.
Public Safety Department; Emergency Management Division	The Emergency Management division works closely with the Orange County Sheriff's Department Emergency Management Division, Orange County Fire Authority, Orange County Health Care Agency, American Red Cross, other county departments and agencies, and surrounding cities in order to provide the highest possible level of preparedness and coordination when disaster strikes.
Community Emergency Preparedness Academy	The City of Laguna Hills hosts a Community Emergency Preparedness Academy once per year. This academy teaches participants basic emergency and disaster preparedness skills, so they will be able to take care of themselves and their families and also be able to help others in the event of an emergency or in the hours and days following a community-



Laguna Hills Local Hazard Mitigation Plan

Resources	Description of Ability to Support Mitigation
	wide disaster. The academy is available for Laguna Hills residents and is free of charge.
Emergency Response Team	Laguna Hills staff are on-call as part of their employment agreement and are trained through FEMA, along with OCFA and OCSD. Any mitigation pertaining to training, education, and communication will likely involve staff.
Moulton Niguel Water District & El Toro Water District	Moulton Niguel Water District (MNWD) & El Toro Water District (ETWD) provide water and wastewater service to the City. MNWD and ETWD are part of the Orange County Regional Water and Wastewater Multi-jurisdictional Hazard Mitigation Plan (MJHMP) which identifies district-specific mitigation actions pertaining to hardening and protecting water and wastewater infrastructure and service reliability and resiliency. Mitigation actions related to water conservation and hardening of critical facilities specific to water and wastewater will be implemented in coordination with MNWD and ETWD.
California Department of Transportation	The California Department of Transportation (Caltrans) has jurisdiction, owns, operates, and maintains several of the roadways/bridges within Laguna Hills. Mitigation actions related to ensuring emergency transportation routes are maintained, repaired, and strengthened will require coordination and implementation by Caltrans.
Southern California Edison and San Diego Gas & Electric	SCE and SDG&E provide electrical service to Laguna Hills. These providers own and maintain electrical conveyance infrastructure. Mitigation actions specific to the provision of these services will be implemented in coordination with SCE and SDG&E.
Southern California Gas Company	Southern California Gas Company (Gas Company) provides natural gas service to Laguna Hills. The Gas Company owns and maintains natural gas conveyance infrastructure. Mitigation actions specific to the provision of these services will be implemented in coordination with the Gas Company.
Wireless Facilities	A variety of service providers provide communication services within Laguna Hills. Mitigation actions specific to the provision of these services will be implemented in coordination with these service providers.
Partnering Arrangements or Intergovernmental Agreements	The OCFA and OCSD have memoranda of understandings with other fire and law enforcement agencies to provide services in emergency events.
American Red Cross	The City of Laguna Hills has relationship with the local Red Cross office in Santa Ana. The Red Cross provides both technical and education/outreach support in the implementation of mitigation actions.
Nellie Gail Emergency Preparedness Committee (EPC)	The Nellie Gail Emergency Preparedness Committee (EPC) works on behalf of the Nellie Gail community to organize and prepare for a disaster. The EPC has established a functional Emergency Command Center that provides primary



Laguna Hills Local Hazard Mitigation Plan

Resources	Description of Ability to Support Mitigation
	responsibility for acquiring a neighborhood overview or “big picture” status of the disaster. The Emergency Command Center communicates the needs of the Nellie Gail community to first responders in order to obtain the most rapid and efficient deployment of any available emergency services such a fire, police, rescue services, during the earliest stages of a disaster or emergency. The EPC is working continuously to form teams of residents and identify specific skills and capabilities so that Nellie Gail Ranch residents can help each other. Volunteers are sought to support emergency communications, basic first aid needs, as well as the unique needs of the equestrian community safeguarding both large and small animals. Nellie Gail's EPC serves as an example to other homeowners associations (HOAs) within Laguna Hills.
Financial	
Federal Emergency Management Agency	FEMA is the federal agency responsible for hazard mitigation, emergency preparedness, and emergency response and recovery activities. It provides guidance to State and local governments on hazard mitigation activities, including best practices and how to comply with federal requirements. FEMA also provides funding for hazard mitigation actions through three grant programs: Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA) Grant, and Building Resilient Infrastructure and Communities (BRIC). The HMGP requires a presidential hazard declaration before funding is available; after a hazard is declared, grant applications can be submitted on a rotating basis. Both BRIC and FMA applications typically open during the fall. Outside of the Hazard Mitigation Assistance Grants, FEMA also administers Preparedness Grants and Resilience Grants that may be applicable to future City projects.
California Governor's Office of Emergency Services	Cal OES is responsible for overseeing and coordinating emergency preparedness, response, recovery and homeland security activities within California. Cal OES regularly dispatches team members to join first responders, emergency leaders and those affected by disasters that threaten public safety, to provide information essential to the public. Cal OES can assist in obtaining funding for mitigation actions identified in the plan and providing guidance on future plan updates. Additionally, Cal OES is responsible for administration and distribution of federal grant funding for the FEMA grant programs listed above.
Emergency Reserve Fund	The City maintains an emergency reserve fund for emergency needs: “The City will strive to achieve and maintain a minimum Assigned and Unassigned Fund Balance Reserve of 40% of the annual operating budget for operating contingencies,



Laguna Hills Local Hazard Mitigation Plan

Resources	Description of Ability to Support Mitigation
	emergencies caused by calamitous events, and economic uncertainty."
EOC Activation	When the City's EOC is activated, costs are tracked for eligible reimbursement.
Education & Outreach	
AlertOC	AlertOC is a mass notification system designed to keep Orange County residents and businesses informed of emergencies and certain community events. By registering with AlertOC, time-sensitive voice messages from the County or City in which someone lives or works may be sent to their home, cell, or business phone. This system can be used to implement mitigation actions pertaining to public outreach and dissemination of accurate and timely information during a hazard event.
Orange County Crime Stoppers	This service allows citizens to anonymously report potential criminal activity and/or supply information regarding suspects of crimes. It allows people to report non-emergency information either by phone call, web or text. This program can be critical to mitigate a potential terrorist event.
Sherriff Explorer Program	The Explorer Program provides young adults (age 14-20) with the opportunity to assist the OCSD in Laguna Hills. Through weekly meetings, Explorers can broaden their knowledge and learn firsthand about the challenges and rewards of a career in law enforcement. Explorers receive training in a variety of topics including leadership, patrol procedures, first-aid, and laws of arrest.
Neighborhood Watch Program	Neighborhood Watch is a crime prevention program which enlists the active participation of residents in cooperation with law enforcement to reduce crime in their communities. It involves neighbors getting to know each other and working together in a program of mutual assistance. Residents become trained to recognize and report suspicious activities, and can then implement crime prevention techniques such as residential and vehicle security, and personal safety into their neighborhoods.
Emergency Preparedness Outreach	Disasters cannot be prevented; however, the community can reduce the effects of disasters before they occur, prepare for what could happen, and improve response and recovery. Several mitigation actions pertain to outreach and information to the community and can be implemented through a variety of programs and events in coordination with the City and other partner agencies and stakeholders.
Police/Fire Community Awareness Events	Events provide an opportunity to implement mitigation actions specific to educating and informing the community regarding hazards and ways to reduce impacts from the hazards and what to do during an emergency.



Laguna Hills Local Hazard Mitigation Plan

Resources	Description of Ability to Support Mitigation
Homeowner Associations	The City of Laguna Hills is comprised of several Homeowner's Associations. The associations can help to implement mitigation actions through the distribution of information to their residents.
City Website, E-Newsletter, Social Media, Brochures and Pamphlets	These various forms of communication provide an opportunity to convey information and implement mitigation actions specific to educating and informing the community regarding all hazards and ways to reduce impacts from the hazards.

5.2 HAZARD MITIGATION OVERVIEW

5.2.1 FEMA'S NATIONAL FLOOD INSURANCE PROGRAM

The National Flood Insurance Program (NFIP) provides affordable insurance to property owners, renters and businesses by encouraging communities to adopt and enforce floodplain management regulations. Participation in the NFIP is optional; however, property owners who live in a non-participating community with flood-prone areas are not able to buy flood insurance through the program. Communities with mapped floodplains cannot receive federal grants or loans for development activities in flood-prone areas and cannot receive federal disaster assistance to repair flood damaged buildings in mapped floodplains if they are not participants of the NFIP.

The City of Laguna Hills is a participant in the National Flood Insurance Program (NFIP). The City plans to continue its participation in the NFIP and comply with the requirements. Implementation of LHMP Mitigation Action 1 would assist with compliance. Mitigation Action 1 addresses future updates to the City's General Plan to ensure that current floodplain information is incorporated, and that goals and policies adequately respond to floodplain conditions within the City in order to reduce vulnerability to flood hazards. Additionally, it should be noted that the City's General Plan Land Use map identifies where specific land uses are allowed within the City. The City's Open Space designation is applied to creek corridors, utility corridors, publicly maintained open space, and open space reserves and preserves. The City will continue to use its General Plan land use designations to control development within these areas. Development within Laguna Hills has been planned and constructed in conformance with the NFIP, and the existing flood control and stormwater drainage systems have both been designed and created to accommodate the anticipated growth and future land development within Laguna Hills. The City intends to optimize the existing system and maintain the community's drainage features in their natural condition. The City works closely with OC Flood to construct and



Laguna Hills Local Hazard Mitigation Plan

maintain flood control facilities for the community. In addition, the City requires adequate flood control facilities to protect all structures and major roadways from hazards associated with being near a 100-year floodplain and will require new development and redevelopment to be located to either avoid flood hazards or incorporate them into the overall design.

5.2.2 HAZARD MITIGATION GOALS

The mitigation goals, presented in Section 1.5, *Mitigation Goals*, serve as the basis for direction to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property, and the environment from hazards. The plan goals guide the direction of future activities aimed at reducing risk and preventing loss from hazards. The goals also serve as checkpoints as agencies and organizations begin implementing mitigation action items.

The hazard mitigation actions identified below list those activities that the City will use to reduce their risk of potential hazards. These mitigation actions were identified through discussions and collaboration with the LHMP Planning Team. Some of these actions may be eligible for funding through federal and State grant programs and other funding sources as made available to the City. The mitigation actions are intended to address the comprehensive range of identified hazards. Some actions may address risk reduction from multiple hazards.

5.2.3 HAZARD MITIGATION PRIORITIZATION

The Planning Team discussed each mitigation action to identify the priority, using the following as guidance:

- **High Priority:** Top organizational priority and is generally a well-detailed project idea. Protects population, resource or property at high risk. Uses feasible methods, techniques or technology.
- **Medium Priority:** A good idea that needs more information or is an action that addresses a moderate hazard.
- **Low Priority:** An idea that needs a lot more information or will take a lot of preliminary action to build support.

Discussions by the Planning Team influenced the priority of the specific mitigation action. For example, some actions although possibly in need of more information, were identified as a high priority due to current conditions, the risk of the hazard, and the probability of



Laguna Hills Local Hazard Mitigation Plan

its occurrence. The Planning Team considered the frequency and severity of the hazard; the vulnerability of the community; the impacts the mitigation action would avoid or reduce; the benefits of the action on the community; the critical facilities that would benefit; the environmental benefits of the action; and the capability of the City and its partner agencies to implement the action.

The Planning Team reviewed the STAPLE/E (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) criteria, as described in Table 5-2, *STAPLE/E Review and Selection Criteria*, when considering and prioritizing the mitigation actions. This methodology, as endorsed by FEMA, requires that social, technical, administrative, political, legal, economic, and environmental factors are considered when reviewing potential actions.

TABLE 5-2: STAPLE/E REVIEW AND SELECTION CRITERIA

STAPLE/E Review	Selection Criteria
Social	- Is the proposed action socially acceptable to the jurisdiction and surrounding community? - Are there equity issues involved that would mean that one segment of the jurisdiction and/or community is treated unfairly? - Will the action cause social disruption?
Technical	- Will the proposed action work? - Will it create more problems than it solves? - Does it solve a problem or only a symptom? - Is it the most useful action in light of other jurisdiction goals?
Administrative	- Can the jurisdiction implement the action? - Is there someone to coordinate and lead the effort? - Is there sufficient funding, staff, and technical support available? - Are there ongoing administrative requirements that need to be met?
Political	- Is the action politically acceptable? - Is there public support both to implement and to maintain the project?
Legal	- Is the jurisdiction authorized to implement the proposed action? - Are there legal side effects? Could the activity be construed as a taking? - Will the jurisdiction be liable for action or lack of action? - Will the activity be challenged?
Economic	- What are the costs and benefits of this action? - Do the benefits exceed the costs? - Are initial, maintenance, and administrative costs considered? - Has funding been secured for the proposed action? If not, what are the potential funding sources (public, nonprofit, and private)? - How will this action affect the fiscal capability of the jurisdiction? - What burden will this action place on the tax base or local economy? - What are the budget and revenue effects of this activity? - Does the action contribute to other jurisdiction goals? - What benefits will the action provide?



Laguna Hills Local Hazard Mitigation Plan

STAPLE/E Review	Selection Criteria
Environmental	- How will the action affect the environment? - Will the action need environmental regulatory approvals? - Will it meet local and State regulatory requirements? - Are endangered or threatened species likely to be affected?

5.2.4 HAZARD MITIGATION BENEFIT – COST REVIEW

FEMA requires local governments to analyze the benefits and costs of a range of mitigation actions that can reduce the effects of each hazard within their communities. Benefit-cost analysis is used in hazard mitigation to show if the benefits to life and property protected through mitigation efforts exceed the cost of the mitigation activity. Conducting benefit-cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now in order to avoid disaster-related damages later. The analysis is based on calculating the frequency and severity of a hazard, avoiding future damages, and risk.

A hazard mitigation plan must demonstrate that a process was employed which emphasized a review of benefits and costs when prioritizing the mitigation actions. The benefit-cost review must be comprehensive to the extent that it can evaluate the monetary as well as the nonmonetary benefits and costs associated with each action. The benefit-cost review should at least consider the following questions:

- How many people will benefit from the action?
- How large an area is impacted?
- How critical are the facilities that benefit from the action (e.g., which is more beneficial to protect, the fire station or the administrative building)?
- Environmentally, does it make sense to do this project for the overall community?

These questions were considered to help determine the appropriateness of mitigation actions. Those actions that did not have adequate benefits were excluded from the list of mitigation actions.



Laguna Hills Local Hazard Mitigation Plan

5.3 HAZARD MITIGATION ACTIONS

The process used by the Planning Team to identify hazard mitigation actions for this plan included the following:

- Review of the vulnerability and risk assessment presented in Section 4.0;
- Review of the capabilities assessment presented in Subsection 5.1;
- Review of the results of the community survey and feedback received as part of the commission meetings; and
- The Planning Team's discussion of concerns/issues that need to be addressed to reduce hazards to critical facilities and the community.

Table 5-3, *Hazard Mitigation Actions*, identifies the mitigation action, hazard(s) it addresses, City Department and/or partner agency/stakeholder responsible for implementation, potential funding sources, priority, and the timeline for implementation. The timeline for implementation is defined as follows:

- Ongoing: 1-2 years and ongoing thereafter
- Short-Term: 1 to 2 years
- Medium-Term: 3 years
- Long-Term: 4 to 5 years



Laguna Hills Local Hazard Mitigation Plan

TABLE 5-3: HAZARD MITIGATION ACTIONS

#	Mitigation Action	Hazard(s) Addressed	Responsible Department/Agency	Potential Funding Sources	Priority	Timeline
1	When updating the City's General Plan, review hazards information and mapping (e.g., dam/reservoir inundation, floodplains, liquefaction, landslide, fire hazard zones) to ensure the most current information is reflected and updated as necessary. Incorporate new and/or revised goals and policies specific to reducing vulnerability to hazards. The City will continue to formally adopt the approved City of Laguna Hills Local Hazard Mitigation Plan into its General Plan Safety Element to ensure compliance with AB 2140, making the City eligible for additional funding under the California Disaster Assistance Act (CDAA).	Multiple Hazards – Dam/Reservoir Failure; Drought; Flood; Human-Induced Hazards; Seismic and Geologic (ground shaking, liquefaction, landslides, mudflows, slope instability); Severe Weather; Wildfire and Urban Fire	Community Development	Staff Time/ General Fund	Low	Long-Term
2	Continue to update emergency-related planning documents every five years to ensure consistency with state and federal law, best practices, local conditions, and recent information and advances.	Multiple Hazards – Dam/Reservoir Failure; Drought; Flood; Human-Induced Hazards; Seismic and Geologic (ground shaking, liquefaction, landslides, mudflows, slope instability); Severe Weather;	Public Safety, Public Services, Community Development	Staff Time/ General Fund; FEMA Grant Funding	Medium	On-going



Laguna Hills Local Hazard Mitigation Plan

#	Mitigation Action	Hazard(s) Addressed	Responsible Department/Agency	Potential Funding Sources	Priority	Timeline
		Wildfire and Urban Fire				
3	Coordinate with partner agencies, such as Orange County Sheriff's Department (OCSD), Orange County Fire Authority (OCFA), American Red Cross, ETWD, MNWD, Age Well, HOAs, and schools to create and disseminate educational materials for residents/business owners to identify their risk to multi-hazards; identify mitigation actions they can implement; provide additional sources and resources for information; and provide classes/seminars, etc.	Multiple Hazards – Dam/Reservoir Failure; Drought; Flood; Human-Induced Hazards; Seismic and Geologic (ground shaking, liquefaction, landslides, mudflows, slope instability); Severe Weather; Wildfire and Urban Fire	Public Safety, Public Services, Community Development, Community Services	Staff Time/General Fund; Federal, State, and Local Funding Sources as Available; FEMA Grant Funding	High	Ongoing
4	Partner with the American Red Cross, the County, neighboring cities, schools, and HOAs to provide evacuation and reunification locations and shelters in an emergency.	Multiple Hazards – Dam/Reservoir Failure; Flood; Human-Induced Hazards; Seismic and Geologic; Severe Weather; Wildfire and Urban Fire	Public Safety, Public Services, Community Development, Community Services	Staff Time/General Fund	High	Ongoing
5	In coordination with OCSD's current program, develop and implement a public outreach campaign to inform the public on warning expectations, including emergency sheltering and evacuation procedures, including	Multiple Hazards – Dam/Reservoir Failure; Flood; Human-Induced Hazards; Seismic and Geologic;	Public Safety, Public Services, Community Development, Community Services	Staff Time/General Fund; Federal, State, and Local Funding Sources as	High	Ongoing



Laguna Hills Local Hazard Mitigation Plan

#	Mitigation Action	Hazard(s) Addressed	Responsible Department/Agency	Potential Funding Sources	Priority	Timeline
	pre-planned maps for distribution to employers and residents, and what alert systems and information sources are available to reduce conveyance of misinformation.	Severe Weather; Wildfire and Urban Fire		Available; FEMA Grant Funding		
6	Coordinate with Saddleback Medical Center to understand their capabilities and opportunities to partner in hazard mitigation activities.	Multiple Hazards – Dam/Reservoir Failure; Flood; Human-Induced Hazards; Seismic and Geologic; Severe Weather; Wildfire and Urban Fire	Public Safety, Public Services, Community Services	Staff Time/ General Fund	Medium	Short-Term
7	Work with Caltrans and neighboring jurisdictions to ensure emergency transportation routes are maintained, repaired, and strengthened, as necessary.	Multiple Hazards – Dam/Reservoir Failure; Flood; Human-Induced Hazards; Seismic and Geologic; Severe Weather; Wildfire and Urban Fire	Public Services	Staff Time/ General Fund	High	Ongoing
8	Work with SCE, SDG&E, ETWD, MNWD, telecommunication providers, and OCTA to ensure that services remain fully active, as much as safely possible, during emergency events and that full service is restored as quickly as possible following an emergency.	Multiple Hazards – Dam/Reservoir Failure; Flood; Human-Induced Hazards; Seismic and Geologic; Severe Weather;	Public Safety, Public Services, Community Development	Staff Time/ General Fund	High	Ongoing



Laguna Hills Local Hazard Mitigation Plan

#	Mitigation Action	Hazard(s) Addressed	Responsible Department/Agency	Potential Funding Sources	Priority	Timeline
		Wildfire and Urban Fire				
9	Partner with the local community and other organizations, such as the American Red Cross, religious organizations, non-profits, and partner agencies (So Cal Gas, SCE, SDG&E, ETWD, MNWD) to work directly with vulnerable populations (elderly, homeless, low income, special needs, etc.) to identify opportunities to mitigate impacts in the event of a natural disaster, including the identification of available resources and how to access and implement those resources.	Multiple Hazards – Dam/Reservoir Failure; Flood; Human-Induced Hazards; Seismic and Geologic; Severe Weather; Wildfire and Urban Fire	Public Safety, Public Services, Community Development, Community Services	Staff Time/General Fund; Federal, State, and Local Funding Sources as Available; FEMA Grant Funding	High	Ongoing
10	Explore the opportunity (including funding and staff resources) to establish a Community Emergency Response Team (CERT) program.	Multiple Hazards – Dam/Reservoir Failure; Flood; Human-Induced Hazards; Seismic and Geologic; Severe Weather; Wildfire and Urban Fire	Public Safety	Staff Time/General Fund; FEMA Grant Funding	Medium	Medium-to Long-Term
11	Seek funding to purchase a generator for the Laguna Hills Community Center & Sports Complex.	Multiple Hazard – Seismic (earthquake); Wildland and Urban Fire; Severe Weather	Public Services	Staff Time/General Fund; FEMA Grant Funding	High	Short-Term



Laguna Hills Local Hazard Mitigation Plan

#	Mitigation Action	Hazard(s) Addressed	Responsible Department/Agency	Potential Funding Sources	Priority	Timeline
		(heavy rains, Santa Ana winds, extreme heat)				
12	Conduct a feasibility assessment of installation of backup energy systems (solar, battery, fuel cell, natural gas generator) at key critical facilities within the City.	Multiple Hazard – Seismic (earthquake); Wildland and Urban Fire; Severe Weather (heavy rains, Santa Ana winds, extreme heat)	Public Services	Staff Time/General Fund; Federal, State, and Local Funding Sources as Available; FEMA Grant Funding	Low	Medium-Term
13	Coordinate with dam and reservoir owners to notify property owners if located within an inundation area and provide education information and resources in the event of an emergency.	Dam/Reservoir Failure	Public Services	Staff Time/General Fund; Federal, State, and Local Funding Sources as Available; FEMA Grant Funding	Medium	Medium-to Long-Term
14	Continue to proactively monitor and perform regular drainage system maintenance including removal of debris prior to storm events and similarly encourage HOAs and other property owners to proactively remove debris from their drainage systems.	Multiple Hazards – Flooding, Severe Weather (Heavy Rains), Mudflow	Public Services	Staff Time/General Fund	High	Ongoing
15	Working with partner agencies, as needed, identify causes of localized flooding and potential improvements in areas of Canada Channel (F-23); El	Multiple Hazards – Flooding, Severe Weather (Heavy Rains)	Public Services	Staff Time/General Fund; Federal, State, and Local	Medium/High	Ongoing



Laguna Hills Local Hazard Mitigation Plan

#	Mitigation Action	Hazard(s) Addressed	Responsible Department/Agency	Potential Funding Sources	Priority	Timeline
	Toro Road/Avenida de la Carlota; Beckenham Street downdrain; and Largo Drive. Seek funding for improvements to address existing deficiencies and prevent future flooding. Prioritize repairs of facilities that result in flooding to roadways that serve as emergency access and evacuation routes.			Funding Sources as Available; FEMA Grant Funding		
16	Continue to identify localized areas of flooding associated with City-owned facilities and seek funding for improvements to prevent future flooding associated with the drainage facility. Prioritize repairs of facilities that result in flooding to roadways that serve as emergency access and evacuation routes.	Multiple Hazards – Flooding, Severe Weather (Heavy Rains)	Public Services	Staff Time/ General Fund; Federal, State, and Local Funding Sources as Available; FEMA Grant Funding	Medium/ High	Ongoing
17	Coordinate with County of Orange and neighboring cities to identify areas of flooding during heavy rain events to ensure the responsible agency(ies) can take corrective action to prevent future flooding associated with the drainage facility. Request prioritization of repairs of facilities that result in flooding to roadways that serve as emergency access and evacuation routes.	Multiple Hazards – Flooding, Severe Weather (Heavy Rains)	Public Services	Staff Time/ General Fund; Federal, State, and Local Funding Sources as Available; FEMA Grant Funding	Medium/ High	Ongoing



Laguna Hills Local Hazard Mitigation Plan

#	Mitigation Action	Hazard(s) Addressed	Responsible Department/Agency	Potential Funding Sources	Priority	Timeline
18	Educate citizens about safety during flood conditions, including the dangers of driving on flooded roads.	Multiple Hazards – Flooding, Severe Weather (Heavy Rains)	Public Safety, Public Services, Community Development, Community Services	Staff Time/ General Fund	High	Ongoing
19	Retrofit roadway medians to capture storm water during rain events.	Multiple Hazards – Flooding, Drought, Severe Weather (Heavy Rains)	Public Services	General Fund; Federal, State, and Local Funding Sources as Available; FEMA Grant Funding	Low	Long-Term
20	Monitor changes/updates to building codes and seismic regulations to determine if City-owned critical facilities may need seismic retrofits as they age and building codes are updated.	Seismic and Geologic	Community Development	Staff Time/ General Fund	Medium	Long-Term
21	If any City-owned critical facility is determined to be seismically vulnerable, identify a plan to conduct structural retrofitting, including funding sources.	Seismic and Geologic	Public Services, Community Development	Staff Time/ General Fund; Federal, State, and Local Funding Sources as Available; FEMA Grant Funding	Medium	Long-Term
22	Work with owners of critical facilities to ensure facilities are evaluated for seismic safety. If any critical facilities are determined to be seismically vulnerable, work with the owner to	Seismic and Geologic	Public Services, Community Development	Staff Time/ General Fund; Federal, State, and Local Funding Sources as Available;	Medium	Long-Term



Laguna Hills Local Hazard Mitigation Plan

#	Mitigation Action	Hazard(s) Addressed	Responsible Department/Agency	Potential Funding Sources	Priority	Timeline
	identify potential funding sources to implement seismic retrofits.			FEMA Grant Funding		
23	Educate and encourage property owners to secure furnishings, storage cabinets, and utilities to prevent injuries from damage. Examples include anchoring bookcases, dressers, and file cabinets, installing latches on drawers and cabinet doors, securing desktop computers and appliances, using flexible connections on gas water lines, and securely mounting framed pictures and mirrors.	Seismic and Geologic	Public Services, Community Development	Staff Time/ General Fund; Federal, State, and Local Funding Sources as Available; FEMA Grant Funding	High	Short-Term
24	Partner with Nellie Gail Ranch HOA/Emergency Preparedness Committee to obtain authorization from MNWD for the HOA to install an antenna at MNWD's water tank for improved communication during emergencies.	Multiple Hazard – Seismic (earthquake); Wildland and Urban Fire; Severe Weather (heavy rains, Santa Ana winds, extreme heat)	Public Services, Community Development	Staff Time/ General Fund	High	Short-Term
25	Coordinate with HOAs for the potential to create an emergency preparedness committee, similar to Nellie Gail Ranch.	Multiple Hazard – Seismic (earthquake); Wildland and Urban Fire; Severe Weather (heavy rains, Santa Ana winds, extreme heat)	Public Services, Community Development, Community Services	Staff Time/ General Fund	Medium	Medium-Term



Laguna Hills Local Hazard Mitigation Plan

#	Mitigation Action	Hazard(s) Addressed	Responsible Department/Agency	Potential Funding Sources	Priority	Timeline
26	As landscaping is installed or replaced within City-owned facilities, prioritize the installation of drought-tolerant and fire-resistant landscaping, specifically within the wildland-urban interface, where feasible.	Multiple Hazards – Drought and Wildland and Urban Fire	Public Services	General Fund; Federal, State, and Local Funding Sources as Available; FEMA Grant Funding	Medium/High	Ongoing
27	Coordinate with the City's water providers to make available drought education materials and other related incentives for residents and businesses to conserve water.	Drought	Community Development, Public Services	Staff Time/General Fund, Staff Time; Federal, State, and Local Funding Sources as Available; FEMA Grant Funding	Medium/High	Ongoing
28	Require State-mandated water conservation measures during drought emergencies.	Drought	Community Development, Public Services	Staff Time/General Fund	Medium	Ongoing
29	Provide information to the community regarding the proper handling, storage and disposal of hazardous materials and publicize County locations and events for disposal of household hazardous waste items.	Human-Induced Hazards (Hazardous Materials)	Community Development, Public Services, Community Services	Staff Time/General Fund	Low/Medium	Ongoing
30	Participate in programs and emergency response exercises with federal and state agencies and Southern California Edison to	Human-Induced Hazards (Hazardous Materials)	Community Development, Public Services, Public Safety, in coordination with SCE	Staff Time/General Fund, Staff Time; Federal, State, and Local	Medium/High	Ongoing



Laguna Hills Local Hazard Mitigation Plan

#	Mitigation Action	Hazard(s) Addressed	Responsible Department/Agency	Potential Funding Sources	Priority	Timeline
	minimize community risks related to nuclear power production at SONGS.			Funding Sources as Available; FEMA Grant Funding		
31	Regularly update cyber security software and educate City employees on current threats.	Human-Induced Hazards (Cyber-Threat)	Public Safety, IT Division	Staff Time/ General Fund, Staff Time; FEMA Grant Funding	Medium	Ongoing
32	Monitor the timing of the City's annual Weed Abatement Program and adjust as necessary to account for fire hazard conditions and potential changes to the timing of the fire season.	Wildland and Urban Fire	Public Services	Staff Time/ General Fund	Medium/ High	Ongoing
33	Continue to regularly conduct brush clearing and weed abatement programs within the wildland urban interface, particularly around critical facilities. Coordinate and partner with external agencies where appropriate. Maintain buffer areas as permitted.	Wildland and Urban Fire	Public Services	Staff Time/ General Fund, Staff Time; Federal, State, and Local Funding Sources as Available; FEMA Grant Funding	High	Ongoing
Ongoing: 1-2 years and ongoing thereafter Short-Term: 1 to 2 years Medium-Term: 3 years Long-Term: 4 to 5 years						



Section 6.0 | Plan Maintenance

This section identifies the formal process that will ensure that the LHMP remains an active and relevant document. The plan maintenance process includes a schedule for monitoring and evaluating the plan annually and producing an update every five years, so the City can maintain eligibility for federal and State hazard mitigation funding.

This section describes how the City will integrate public participation throughout the plan maintenance and implementation process. It also describes how the City intends to incorporate the mitigation actions outlined in this plan into existing planning mechanisms and programs. The plan's format allows the City to readily update sections when new data becomes available, ensuring the plan remains current and relevant.

6.1 METHOD AND SCHEDULE FOR MAINTAINING AND UPDATING THE PLAN

6.1.1 PURPOSE AND AUTHORITY

Section 201.6.(d)(3) of Title 44 of the Code of Federal Regulations requires that local hazard mitigation plans be reviewed, revised if appropriate, and resubmitted for approval in order to remain eligible for benefits awarded under the DMA. As described below, monitoring the progress of the mitigation actions will be on-going throughout the five-year period between the adoption of the LHMP and the next update effort. The LHMP Planning Team will meet on an annual basis to monitor the status of the implementation of mitigation actions and develop updates as necessary.

The City intends to update the plan on a five-year cycle from the date of initial plan adoption. It is anticipated that this update process will be initiated at least one year prior to expiration of the existing plan. The cycle may be accelerated to less than five years based on the following triggers:

- A presidential disaster declaration that impacts the City.
- A hazard event that causes loss of life.

Under the direction of the Public Works Director, the LHMP Planning Team (identified in Section 2.0, *Planning Process*) will be responsible for the on-going maintenance and five-year update of this LHMP. The Public Works Director will take the primary lead in the LHMP



Laguna Hills Local Hazard Mitigation Plan

maintenance by coordinating maintenance of this plan with the Planning Team, including undertaking the formal review process and updating the plan. Key City departments who should have an active role in maintenance and future updates are identified below.

- General Government
- Community Development
- Community Services
- Public Safety
- Public Services

In addition to City staff, the following partner agencies, organization, and stakeholders who were invited to and/or participated on the Planning Team during preparation of the plan should be included in the maintenance and future update activities:

- City of Aliso Viejo
- City of Irvine
- City of Laguna Niguel
- City of Laguna Woods
- City of Lake Forest
- City of Mission Viejo
- City of Rancho Santa Margarita
- Orange County Fire Authority
- Orange County Sheriff's Department
- Orange County Public Works
- El Toro Water District
- Moulton Niguel Water District
- SDG&E
- Southern California Edison
- Southern California Gas Company
- Saddleback Hospital
- Orange County Health Care Agency
- Irvine Unified School District
- Saddleback Unified School District

Although specific Planning Team members may change, the City staff positions and departments and other partner agencies and organizations should continue to be included in the plan implementation and maintenance process.



Laguna Hills Local Hazard Mitigation Plan

The Project Management Team, under the direction of the Public Works Director, will facilitate the Planning Team meetings and will assign tasks such as updating and presenting the plan to other departments, stakeholder groups, and/or elected officials. The Planning Team will be responsible for maintaining and updating the plan and will coordinate implementation of the plan through their respective positions and agencies. Plan implementation and evaluation will be a shared responsibility among all Planning Team Members.

6.1.2 ANNUAL PLAN MONITORING AND MAINTENANCE

It will be important to monitor the progress of the mitigation actions throughout the five-year period between adoption and the next required update. At a minimum, the Public Works Director, representatives from each City Department, and Planning Team members should meet annually to monitor implementation of the LHMP. However, in the event a significant disaster occurs within Laguna Hills, the Public Works Director and City Department representatives will convene within 30 days of the disaster to review and update the LHMP as needed. In addition to City staff, partner agencies, organizations, and stakeholders, may be identified for participation, as appropriate.

The Public Works Director and designees will coordinate with responsible City departments and agencies/organizations identified for each mitigation action. These responsible departments and agencies/organizations will monitor and evaluate the progress made on the implementation of mitigation actions and report to the LHMP Planning Team on an annual basis. Working with the LHMP Planning Team, these responsible departments and agencies/organizations will be asked to assess the effectiveness of the mitigation actions and modify the mitigation actions as appropriate. A LHMP Mitigation Action Progress Report worksheet or tracking mechanism will assist departments and agencies/organization responsible for implementing mitigation actions in reporting on the status and assessing the effectiveness of the mitigation actions.

Information from the departments and agencies/organizations will be used to monitor mitigation actions and inform the annual evaluation of the LHMP. The following questions will be considered as criteria for evaluating the plan's effectiveness:

- Has the nature or magnitude of hazards affecting the City changed?
- Are there new hazards that have the potential to impact the City?
- Do the identified goals and actions address current and expected conditions?
- Have mitigation actions been implemented or completed?



Laguna Hills Local Hazard Mitigation Plan

- Has the implementation of identified mitigation actions resulted in expected outcomes?
- Are current resources adequate to implement the LHMP?
- Should additional local resources be committed to address identified hazards?

As part of the annual meeting, the progress of implementing the mitigation actions will be documented and opportunities to incorporate the actions into other planning documents will be identified. This review will include the following:

- Summary of any hazard events that occurred during the prior year and their impacts on the community.
- Review of successful mitigation initiatives identified in the plan.
- Discussion about why targeted mitigation actions were not completed.
- Reevaluation of the mitigation actions to determine if the timeline for identified projects needs to be amended (such as changing a long-term project to a short-term project due to funding availability).
- Recommendations for new mitigation actions.
- Changes in, or potential for, new funding options/grant opportunities.
- Integration of new data and maps that can be used to inform the plan.
- Evaluation of any other planning programs or initiatives within the City that involve hazard mitigation.

The purpose of the annual evaluation will be to ensure consideration and implementation of the LHMP and document progress in order to inform future LHMP updates. Future updates to the LHMP will account for any new hazard vulnerabilities, special circumstances, or new information that becomes available. Issues that arise during the annual LHMP evaluation that require changes to the risk assessment, mitigation strategy, and other components of the plan, will be incorporated into the next update of the LHMP in 2027. The questions identified above would remain valid during the preparation of the 2027 plan update.

6.1.3 FIVE-YEAR UPDATE

The intent of the five-year update process will be to add new planning process methods, community profile data, hazard data and events, vulnerability analyses, mitigation actions, and goals to the adopted plan so that the LHMP will always be current and up to date. Based on the needs identified by the Planning Team and incorporating information from the annual monitoring and maintenance activities, the update will, at a minimum, include the elements below:



Laguna Hills Local Hazard Mitigation Plan

- The update process will be convened through a Planning Team identified by the Public Works Director.
- The hazard risk assessment will be reviewed and updated using best available information and technologies.
- Based on new/updated information provided by facility owners and available funding, the evaluation of critical facilities and mapping will be updated and improved.
- The mitigation actions will be reviewed and revised to account for any actions completed, deferred, or changed to account for changes in the risk assessment or new City policies identified under other planning mechanisms, as appropriate (such as the City's General Plan).
- The draft update will be sent to appropriate agencies for comment.
- The public will be given an opportunity to comment prior to adoption.
- The City Council will adopt the updated LHMP.

6.2 ADOPTION

The LHMP Draft plan was presented to the City Council of Laguna Hills prior to transmittal to FEMA for review. The City Council is responsible for adopting the LHMP. This formal adoption should take place every five years. Once the plan has received FEMA Approval Pending Adoption, the City Council will need to adopt the plan. Upon adoption, the City will transmit the adopted plan to FEMA.

6.3 INCORPORATION INTO EXISTING PROGRAMS AND PLANNING MECHANISMS

The effectiveness of the nonregulatory LHMP depends on the implementation of the plan and incorporation of the mitigation action items into City plans, policies, and programs. The City's General Plan is considered to be an integral part of this plan. The City, through the recent update and adoption of its General Plan Safety Element, has planned for the impact of hazards. The LHMP process has allowed the City to review the goals and policies contained in the General Plan Safety Element and identified mitigation actions that will further implement these policies. The City views the General Plan and the LHMP as complementary planning documents that work together to achieve the ultimate goal of the reduction of risk exposure to Laguna Hills citizens and property. Many of the ongoing recommendations identified in the mitigation strategy further the goals and



Laguna Hills Local Hazard Mitigation Plan

policies of the General Plan and other adopted plans. Further, the City has acknowledged as part of the Safety Element the development of this LHMP and has incorporated it by reference.

The plan includes a range of action items that, if implemented, would reduce loss from hazard events in the City. Together, the mitigation action items in the LHMP provide the framework for activities that the City may choose to implement over the next five years. The City has prioritized the plan's goals and identified actions that will be implemented (resources permitting) through existing plans, policies, and programs. In addition to the General Plan, the City will coordinate the recommendations of the LHMP with other existing plans and programs, which include, but are not limited to:

- Capital Improvement Program Planning
- Annual Budget
- Laguna Hills General Plan Updates and Annual Report
- Laguna Hills Municipal Code
- Development Project Review
- California Environmental Quality Act Review

Additional opportunities to integrate the mitigation actions include the following:

- Integration of mitigation actions in emergency response and post-disaster recovery planning.
- Ongoing education and outreach programs to increase staff, resident, business owner, employees, and overall community awareness of the risks and opportunities to implement mitigation actions associated with natural hazards.
- Continued coordination with the City and other partner agencies and organizations on emergency operations and training opportunities.
- Continued consideration of hazard implications and opportunities to implement hazard mitigation as City plans, policies, procedures, and practices are prepared and updated.

Although the Public Works Department will have primary responsibility for review, coordination, and promotion, plan implementation and evaluation will be a shared responsibility among all departments identified as lead departments in the mitigation action plan.



Laguna Hills Local Hazard Mitigation Plan

6.4 CONTINUED PUBLIC INVOLVEMENT

The public will continue to be informed on LHMP actions through the City websites and through the annual progress report to the City Council. The adopted LHMP will be made available on the City's website. Upon initiation of the LHMP update, a new public involvement strategy will be developed based on guidance from the Planning Team. This strategy will be based on the needs and capabilities of the City at the time of the update. At a minimum, this strategy will include the use of the City website, email distribution lists, and social media, as well as coordination with partner agencies and organizations.

6.5 POINT OF CONTACT

Primary point of contact for the LHMP:

Joe Ames, P.E., T.E.
Public Works Director/City Engineer
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Laguna Hills Local Hazard Mitigation Plan

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City of Laguna Hills

Traffic Commission

Staff Report

DATE: March 15, 2023
TO: Traffic Commissioners
FROM: Joe Ames
Public Works Director/City Engineer
ISSUE: Electric Bicycle, Bicycle, and Motorized Mobility Device Safety

RECOMMENDATION: That the Traffic Commission: 1) Receive and file the report; and 2) Provide comments, if any, on the City staff written report presented at the November 16, 2022, meeting.

SUMMARY:

At the September 13, 2022, City Council meeting, the City Council directed the Traffic Commission and City staff to research safety concerns over bicycles, electric bicycles, and motorized mobility devices and provide a report to City Council. City staff and Police Services prepared a report for presentation to the Traffic Commission at the November 16, 2022, Traffic Commission meeting that was intended to serve as the basis for a future City Council report and presentation. During the November 16, 2022, Traffic Commission meeting, the Commissioners indicated they wanted more time to review City staff's written report. To this end, City staff placed this item on tonight's agenda to allow the Traffic Commissioners an opportunity to provide any thoughts to staff on the written report prior to the report being provided to City Council.

BACKGROUND:

The Public Works Director/City Engineer understood this topic was raised by Councilmember Sedgwick at the September 13, 2022, City Council meeting after he learned about the City of Carlsbad's declared "state of emergency" related to recent electric bicyclist fatalities, and after Mayor Wheeler was contacted separately by a Laguna Hills resident requesting more dedicated bicycle routes through the City.

Electric Bicycle, Bicycle, and Motorized Mobility Device Safety

March 15, 2023

Page 2

At the November 16, 2022, Traffic Commission meeting, City staff presented a written report and presentation outlining the following:

1. Types of electric bicycles (e-bikes) and motorized mobility devices, relative speeds, and why riding them on sidewalks, trails, and other areas can pose a risk to other users;
2. Existing City ordinances and State law regarding bicycles and motorized mobility devices;
3. A summary of Police Services observations regarding safety issues and enforcement (which will be supported by a separate verbal presentation by Police Services);
4. Existing bicycle routes and classes of bicycle routes; and
5. Proposed solutions including education, new ordinances, and new bicycle infrastructure, including ideas for future new dedicated Class 1 bikeways.

In addition, Police Services made a presentation to the Commission at this meeting regarding their own observations and enforcement, including its understanding of existing City ordinances and State laws.

Since November 2022 City staff has been participating in a newly formed E-Bike Coordination Meeting convened by the Orange County Transportation Authority. Staff from all 34 Orange County cities and the County as well as Caltrans are participating. Since September, OCTA has developed educational videos for viewing by the general public and for use by police departments as an aid in educating bicyclists about the laws pertaining to e-bike use. OCTA is also investigating funding sources for new bikeway construction and enhancements to existing bikeways.

DISCUSSION:

Additional discussion on this topic can be found in the November 16, 2022, meeting video posted on the City's website at:

<http://lagunahillsca.iqm2.com/Citizens/SplitView.aspx?Mode=Video&MeetingID=1496&Format=Agenda>

FISCAL IMPACT:

None.

ATTACHMENTS:

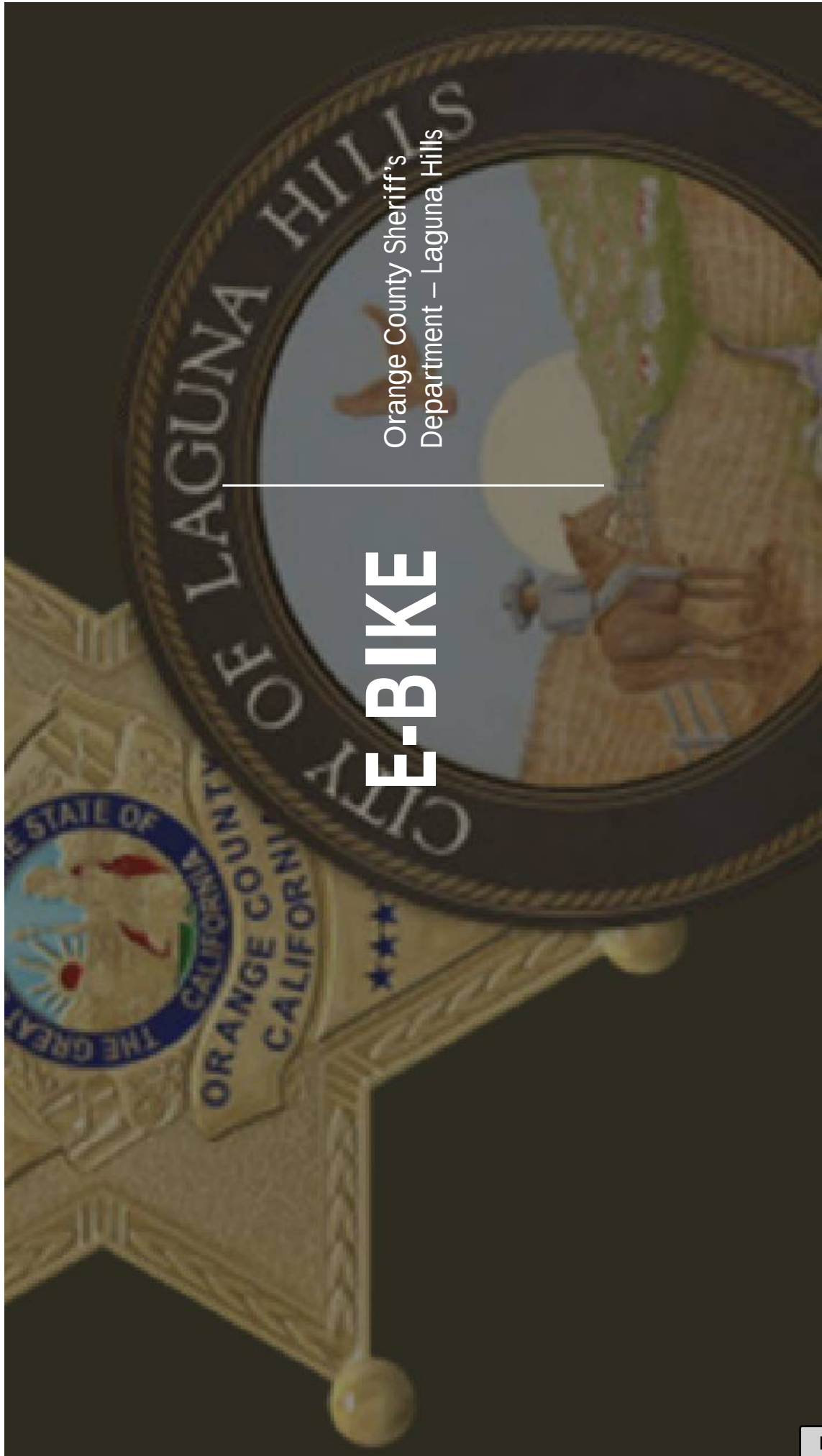
- Police Services November 16 2023 Presentation

Electric Bicycle, Bicycle, and Motorized Mobility Device Safety

March 15, 2023

Page 3

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- Agenda Item 4.1 Nov 16 2022



Orange County Sheriff's
Department – Laguna Hills

E-BIKE

WHAT IS AN E-BIKE?

An “electric bicycle” is a bicycle equipped with fully operable pedals and an electric motor of less than 750 watts (CVC 312.5).

TYPES OF ELECTRIC BICYCLES

- Class 1 E-bikes, also called low-speed pedal-assisted bicycle:
 - Have motors that provides assistance only when the rider is pedaling
 - Stop providing assistance when the bicycle reaches the speed of 20 miles per hour



TYPES OF ELECTRIC BICYCLES

- Class 2 E-bikes, also called low-speed throttle-assisted bicycles:
 - Have motors that may be used to propel the bicycle without pedaling
 - Are not capable of providing assistance when the bicycle reaches the speed of 20 miles per hour

TYPES OF ELECTRIC BICYCLES

- Class 3 E-bikes, also called pedal-assisted bicycles:
 - Have motors that provide assistance only when the rider is pedaling
 - Stop providing assistance when the bicycle reaches the speed of 28 miles per hour
 - Have speedometers



BICYCLES ON CITY SIDEWALKS

The Laguna Hills Municipal Code 11-32.040 provides that City Council may designate any public sidewalk or other public property as a no bicycling area by resolution and posting signage.

The Laguna Niguel Municipal Code (LNMC) provides that bicycles, including electric bicycles, may be operated on the sidewalk at a speed not to exceed five miles per hour (Sec. 7-4-500).

USE OF ELECTRIC BICYCLES ON CITY TRAILS

Under the California Vehicle Code (CVC) section 21207.5, a **Class 3** electric bicycle **shall not** be operated on a bicycle path or trail, unless it is within or adjacent to a roadway or unless the local authority or the governing body of a public agency having jurisdiction over the path or trail permits by ordinance, the use of Class 3 electric bicycles.

E-BIKE SAFETY

- An e-bike, like any regular bicycle, is a vehicle and is required to follow all roadway rules and laws.
- Act like a car, be predictable and visible.
- Wear bright or reflective clothing.

E-BIKE SAFETY

- Look out of other roadway users and never assume they will see you especially at intersections.
- Use the e-bike's bell or politely say "on your left" when passing.
- Younger riders may not understand traffic laws or rules.

E-BIKE SAFETY

USE SIGNALS



IMPORTANT REMINDERS

- CVC section 21213 - No person under 16 years of age shall operate a Class 3 electric bicycle.
- **All** individuals **must** wear a properly fitted and fastened bicycle helmet while operating a Class 3 electric bicycle.

IMPORTANT REMINDERS

An operator shall not allow a person riding as a passenger, and a person shall not ride as a passenger, on a bicycle upon a highway other than upon or astride a separate seat attached thereto. CVC 21204 (b).

If the passenger is four years of age or younger, or weighs 40 pounds or less, the seat shall have adequate provision for retaining the passenger in place and for protecting the passenger from the moving parts of the bicycle.

IMPORTANT REMINDERS

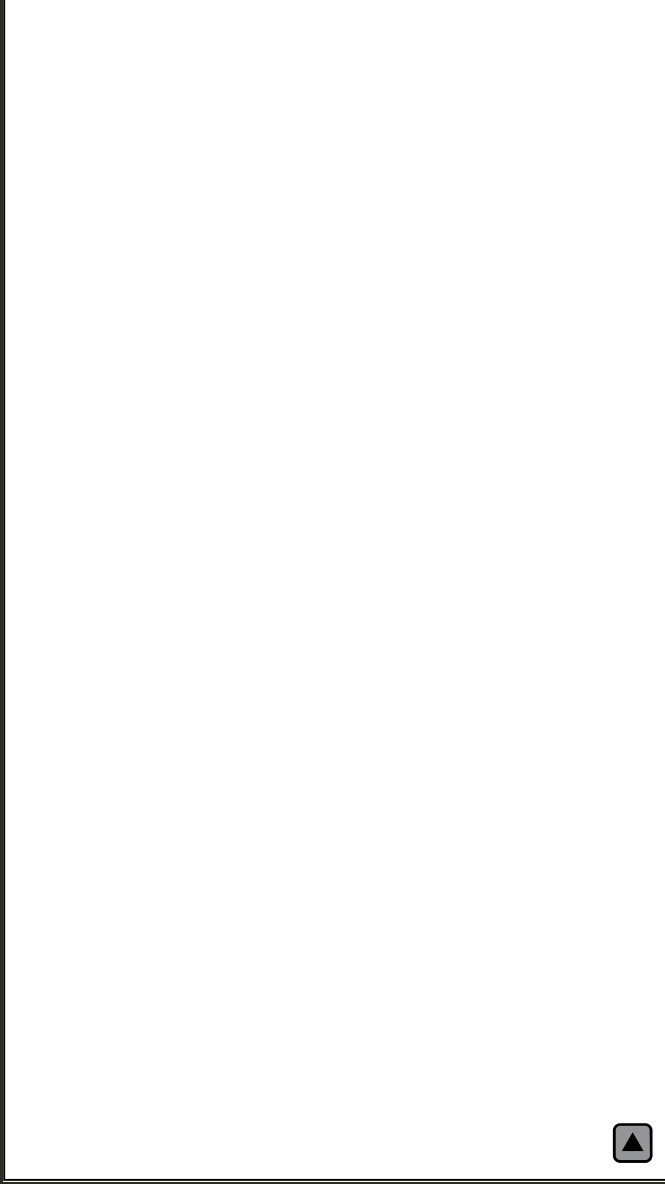
No person operating a bicycle shall leave a bicycle lane until the movement can be made with reasonable safety and then only after giving an appropriate signal in the event that any vehicle may be affected by the movement. CVC 21208 (b).

IMPORTANT REMINDERS

People under 18 years of age must wear a helmet regardless of the type of electric bicycle. CVC 21212.

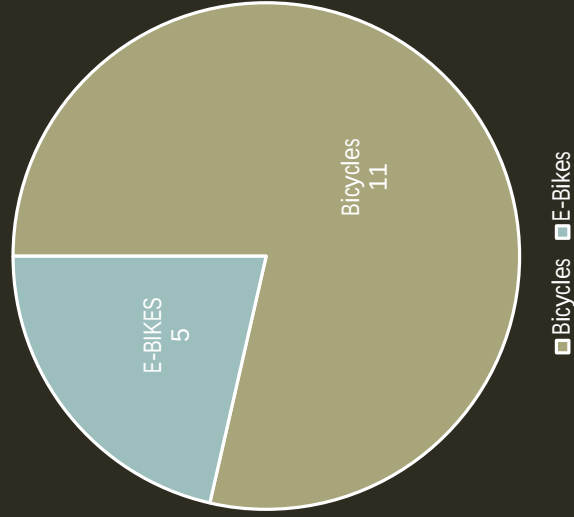
HELMET VIOLATION - \$197

BE CAUTIOUS



INCIDENTS 2020-2022

Traffic Collisions Jan 2020 to Present



E-BIKE CITATIONS 2020-2022

TOTAL = 3 CITATIONS

CVC 21650 – RIGHT SIDE OF ROADWAY

CVC 27803 – HELMET REQUIRED

CVC 12500 – UNLICENSED (E-bike over 30 mph)

Mission Hospital

- Mission Hospital Trauma Center has seen a significant increase in traumatic bike injuries, with a majority of riders on e-bikes.
- Mission Hospital patients treated due to cycling injuries nearly doubled from 2019 to 2020. 179 documented injuries in 2019, and 304 documented injuries in 2020. Many of these injuries resulted from e-bikes.
- As of June 2021, Mission has already 43 e-bike trauma patients. 15 of these patients were under the age of 17.
- Trauma patients are not the same as emergency room patients. A “trauma” designated patient indicates a potential life-threatening injury that requires urgent medical assessment.

REVIEW



QUESTIONS?

References

Laguna Hills Police Services - 949-707-2645

Laguna Niguel Police Services - 949-362-4346

Dana Point Police Services - 949-248-3531

Dispatch Non-Emergency - 949-770-6011

www.peopleforbikes.org/topics/electric-bikes

[CBS Los Angeles - YouTube](#)



City of Laguna Hills

Traffic Commission

Staff Report

DATE: November 16, 2022

TO: Traffic Commissioners

FROM: Joe Ames
Public Works Director/City Engineer

ISSUE: Electric Bicycle, Bicycle, and Motorized Mobility Device Safety

RECOMMENDATION: 1) That the Traffic Commission recommend any suggested modifications to the City staff report for presentation to City Council; 2) That the Traffic Commission receive and file the report made by Laguna Hills Police Services; 3) That the Traffic Commission recommend that the City Council direct City staff to update the Master Bicycle Plan and appropriate funding for this work; 4) That the Traffic Commission recommend the City Council direct Police Services to monitor and observe violations of State law and City codes related to motorized bicycles and devices and report back to the Commission in one year.

SUMMARY:

At the September 13, 2022, City Council meeting, the City Council directed the Traffic Commission and City staff to research safety concerns over bicycles, electric bicycles, and motorized mobility devices and provide a report to City Council. To this end, City staff has prepared the attached report and is making the recommendations listed above for next steps associated with the topic.

BACKGROUND:

The Public Works Director/City Engineer understood this topic was raised by Councilmember Sedgwick after learning about the City of Carlsbad's declared "state of emergency" related to recent electric bicyclist fatalities, and after Mayor Wheeler was contacted separately by a Laguna Hills resident requesting more dedicated bicycle routes through the City.

Electric Bicycle, Bicycle, and Motorized Mobility Device Safety

November 16, 2022

Page 2

DISCUSSION:

In response to City Council's direction for the Traffic Commission and City staff to research concerns over bicycle, electric bicycle, and motorized mobility device safety, the Public Works Director/City Engineer is providing the following report outlining the following:

1. Types of electric bicycles (e-bikes) and motorized mobility devices, relative speeds, and why riding them on sidewalks, trails, and other areas can pose a risk to other users;
2. Existing City ordinances and State law regarding bicycles and motorized mobility devices;
3. A summary of Police Services observations regarding safety issues and enforcement (which will be supported by a separate verbal presentation by Police Services);
4. Existing bicycle routes and classes of bicycle routes; and
5. Proposed solutions including education, new ordinances, and new bicycle infrastructure, including ideas for future new dedicated Class 1 bikeways.

In addition, Police Services will make a presentation to the Commission at this meeting regarding their own observations and enforcement.

FISCAL IMPACT:

None.

ATTACHMENTS:

- Memorandum to the Traffic Commission Concerning Bicycle Safety