4 HAZARDS, SAFETY, AND NOISE

This chapter addresses issues and topics related to hazards and public safety within the City. Some hazards, such as flooding, may occur naturally. Others may be the result of natural hazards exacerbated by human activities, such as development in areas prone to flooding. Additional hazards are entirely human made, including exposure to hazardous materials and airport crash hazards.

This chapter also addresses topics related to noise and vibration, including descriptions of the characteristics of sound and noise and existing transportation, stationary, and construction noise sources within the City. Seismic hazards are discussed in Chapter 5, Conservation, under Geology, Soils, and Seismicity.

This chapter includes the following sections:

4.1 HAZARDOUS MATERIALS AND WASTE

A hazardous material is a substance or combination of substances which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either (1) cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating irreversible illness; or (2) pose a substantial present or potential hazard to human health and safety, or the environment when improperly treated, stored, transported, or disposed of. Hazardous materials are mainly present because of industries involving chemical byproducts from manufacturing, petrochemicals, and hazardous building materials.

Hazardous waste is the subset of hazardous materials that have been abandoned, discarded, or recycled and is not properly contained, including contaminated soil or groundwater with concentrations of chemicals, infectious agents, or toxic elements sufficiently high to increase human mortality or to destroy the ecological environment. If a hazardous material is spilled and cannot be effectively picked up and used as a product, it is considered to be hazardous waste. If a hazardous material site is unused, and it is obvious there is no realistic intent to use the material, it is also considered to be a hazardous waste. Examples of hazardous materials include flammable and combustible materials, corrosives, explosives, oxidizers, poisons, materials that react violently with water, radioactive materials, and chemicals.

The current Laguna Niguel General Plan addresses the topic of hazardous materials and waste within the Seismic/Public Safety and Public Facilities Element. In addition, the Circulation Element has policies that provide for the safe and expeditious transport of hazardous materials.

4.1.1 Environmental Setting

Cortese List

The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies, and developers to comply with the California Environmental Quality Act requirements in providing information about the location of hazardous materials release sites. Government Code Section 65962.5 requires the California Environmental Protection Agency to develop at least annually an updated Cortese List. The California Department of Toxic Substances Control (DTSC) is responsible for a portion of the information contained in the Cortese List. Other State and local government agencies are required to provide additional hazardous material release information for the Cortese List.

The Cortese List is comprised of information from the following resources:

- List of Hazardous Waste and Substances sites from the DTSC's EnviroStor database;
- List of Leaking Underground Storage Tank (LUST) sites from the State Water Board's GeoTracker database;
- List of solid waste disposal sites identified by the State Water Board with waste constituents above hazardous waste levels outside the waste management unit;
- List of "active" Cease and Desist Orders and Cleanup and Abatement Orders from the State Water Board;
- List of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code, as identified by DTSC.

EnviroStor Data Management System

The California Department of Toxic Substances Control maintains the EnviroStor data management system, which provides information on hazardous waste facilities (both permitted and corrective action) as well as any available site cleanup information. This site cleanup information includes Federal Superfund Sites (NPL), State Response Sites, Voluntary Cleanup Sites, School Cleanup Sites, Corrective Action Sites, Tiered Permit Sites, and Evaluation/Investigation Sites. The hazardous waste facilities include Permitted-Operating, Post-Closure Permitted, and Historical Non-Operating.

There are no active cleanup site locations within Laguna Niguel according to the EnviroStor database.[1] Table 4-1 shows four sites within the City. Three sites are under "School Evaluation," where two of the three sites (Elementary School and Proposed Community School #8) are designated as "No Action Required", and the third one (Laguna Niguel Elementary) is considered "Inactive-Needs Evaluation". The fourth site (Green Tree Electronic Recycling) is listed under "Inspection" and is designated as "No Action." The "Elementary School" location received a Phase I Environmental Site Assessment (ESA) in 2001 which found no evidence for potentially impacted soil and/or groundwater at the site, meaning no further investigations into the release of hazardous materials are warranted.[2] The Green Tree Electronic Recycling facility received an inspection of July 25, 2022, where no violations were found. The cleanup status for the "Laguna Niguel Elementary School" facility is deemed inactive and needs further evaluations as of December 12, 2000. Proposed Community School #8 received a Phase I Environmental Site Assessment (ESA) in 2006 and found no known environmental conditions associated with the project site meaning no further investigations are needed.

[1] California Department of Toxic Substances Control. *EnviroStor Site / Facility Search*, https://www.envirostor.dtsc.ca.gov/public/search?basic=True, accessed August 17, 2023.

[2] Ibid

Table 4-1: EnviroStor Database Site/Facility List

Site Name	Program Type	Status	Address Description
Elementary School	School Evaluation	No Action Required	Aliso Creek Road/Niguel Heights Boulevard
Green Tree Electronic Recycling	Inspection	No Action	28052 Camino Capistrano #107
Laguna Niguel Elementary School	School Evaluation	Inactive- Needs Evaluation	Moulton Parkway/Aliso Niguel
Proposed Community School #8	School Evaluation	No Action Required	Paseo De Colinas

SOURCE: CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL, ENVIROSTOR SITE / FACILITY SEARCH, HTTPS://WWW.ENVIROSTOR.DTSC.CA.GOV/PUBLIC/SEARCH?BASIC=TRUE, ACCESSED AUGUST 17, 2023

GeoTracker

GeoTracker is the California State Water Resources Control Board's (SWRCB) data management system for managing sites that impact groundwater, especially those that require groundwater cleanup (Leaking Underground Storage Tank Sites, Department of Defense Sites, Cleanup Program Sites).

Leaking Underground Storage Tanks (LUST)

There are 36 locations within the City that are listed in the GeoTracker database for Leaking Underground Storage Tanks (LUST).[3] Table 4-2 lists the site name for LUSTs and the status of each site. As shown in the table, all LUST sites in Laguna Niguel have a status of Completed – Case Closed.

[3] California State Water Resources Control Board, *GeoTracker*, https://geotracker.waterboards.ca.gov/search, accessed August 17, 2023.

Table 4-2: Geotracker Database LUST Sites

Site Name	Status
Action Moving	Completed - Case Closed
Allen Oldsmobile Cadillac	Completed - Case Closed
Birtcher Niguel Corp	Completed - Case Closed
Boukather & Assoc (Star Motors)	Completed - Case Closed
Cafe Auto Spa	Completed - Case Closed
Chet Holifield building	Completed - Case Closed
Chevron #9-3783	Completed - Case Closed
Clark Foam Products	Completed - Case Closed
Crown Valley Car Wash	Completed - Case Closed
El Niguel Country Club	Completed - Case Closed
El Niguel Country Club	Completed - Case Closed
Exxon	Completed - Case Closed
Fluorcarbons	Completed - Case Closed
Fuel Injection Engineering Co	Completed - Case Closed
Gkn Rentals	Completed - Case Closed
Laguna Niguel Post Office	Completed - Case Closed
Laguna Niguel Regional Park	Completed - Case Closed
Laguna Niguel Touchless Carwash	Completed - Case Closed
Mission Viejo Glass	Completed - Case Closed
Mobil	Completed - Case Closed
Monarch Laguna Associates/Regis Homes Corp	Completed - Case Closed
OC Fire Station #49	Completed - Case Closed
Orange County Fire Station #49	Completed - Case Closed
Orange County Fire Station #5	Completed - Case Closed
Pacific Bell	Completed - Case Closed
Pennysaver	Completed - Case Closed
Rancho Reservoir Pump Station	Completed - Case Closed
SBC	Completed - Case Closed
Sepulveda Building Materials	Completed - Case Closed
Sepulveda Building Materials	Completed - Case Closed
Shell Oil	Completed - Case Closed
Shell Oil	Completed - Case Closed
South County Fueling Station	Completed - Case Closed
Texaco	Completed - Case Closed
Texaco	Completed - Case Closed
US Post Office	Completed - Case Closed

SOURCE: CALIFORNIA STATE WATER RESOURCES CONTROL BOARD. GEOTRACKER, HTTPS://GEOTRACKER.WATERBOARDS.CA.GOV/SEARCH, ACCESSED AUGUST 17, 2023.

Solid Waste Information System

The Solid Waste Information System (SWIS) is a database of solid waste facilities that is maintained by the California Department of Resources Recycling and Recovery (CalRecycle). The SWIS database identifies active, planned, and closed sites, including landfills, transfer stations, material recovery facilities, composting sites, transformation facilities, waste tire sites, and closed disposal sites. There are no facilities listed in the SWIS database located within the City.[4]

Oil Wells

The California Department of Conservation, Geologic Energy Management Division (CalGEM) oversees the drilling, operation, maintenance, and plugging and abandonment of oil, natural gas, and geothermal energy wells. Regulatory programs emphasize the development of oil, natural gas, and geothermal resources in the State through sound engineering practices that protect the environment, prevent pollution, and ensure public safety. See Figure 4-1 for the oil and gas wells in the City.

According to CalGEM, there is one plugged and abandoned well located in the southeastern portion of the City.[5] CalGEM is responsible for implementing Section 3208.1 of the Public Resources Code (PRC), which authorizes CalGEM to order the reabandonment of a previously abandoned well when construction of any structure over or in proximity to a well could result in a hazard. CalGEM's Construction Site Well Review Program assists local permitting agencies in identifying and reviewing the status of oil or gas wells located near or beneath proposed structures. Before issuing building or grading permits, local permitting agencies review and implement CalGEM's preconstruction well requirements.

Nuclear Hazards

The San Onofre Nuclear Generating Station (SONGS) is located on the Marine Corps Base Camp Pendleton in San Diego County, approximately 11 miles southeast of Laguna Niguel. SONGS ceased operations in 2013 and while it is

[4] California Department of Resources Recycling and Recovery (CalRecycle). *SWIS Facility/Site Search*, https://www2.calrecycle.ca.gov/SolidWaste/Site/Search, accessed August 22, 2023.

[5] California Department of Conservation, Geologic Energy Management Division (CalGEM). *Well Finder Mapping Application*, https://maps.conservation.ca.gov/doggr/wellfinder/, accessed August 22, 2023.

in the process of being decommissioned, it still houses nuclear waste.[6, 7] According to the City's Local Hazard Mitigation Plan (LHMP), Laguna Niguel is located within the Ingestion Pathway Zone. In the event of an incident at SONGS, the public would be notified through radio and television broadcast.

4.1.2 References

California Department of Conservation, Geologic Energy Management Division (CalGEM). *Well Finder Mapping Application*, https://maps.conservation.ca.gov/doggr/wellfinder/, accessed August 22, 2023.

California Department of Toxic Substances Control. *EnviroStor Site / Facility Search*, https://www.envirostor.dtsc.ca.gov/public/search?basic=True, accessed August 22, 2023.

California State Water Resources Control Board. *GeoTracker*, https://geotracker.waterboards.ca.gov/search, accessed August 17, 2023.

California Department of Resources Recycling and Recovery (CalRecycle). *SWIS Facility/Site Search*, https://www2.calrecycle.ca.gov/SolidWaste/Site/Search, accessed August 22, 2023.

City of Laguna Niguel, *Laguna Niguel General Plan*, May 1998.

City of Laguna Niguel, *Local Hazard Mitigation Plan (Administrative Draft)*, October 2022.

San Diego County Office of Emergency Services. *SONGS Facts and Preparedness*, https://www.sandiegocounty.gov/content/sdc/oes/emergency_management/oes_jl_SONGS,html, accessed February 27, 2024.

[6] San Diego County Office of Emergency Services. *SONGS Facts and Preparedness*, https://www.sandiegocounty.gov/content/sdc/oes/emergency_management/oes_jl_SONGS.html, accessed February 27, 2024.

[7] City of Laguna Niguel, *Local Hazard Mitigation Plan (Administrative Draft)*, October 2022.

4.2 AIR TRAFFIC

There are no local, major, military, or private airports located within the City. According to the Orange County Airport Land Use Commission, Laguna Niguel is not located in the Santa Ana Airport Influence Area.[8] The current General Plan addresses the topic of air traffic within the Circulation Element.

4.2.1 Environmental Setting

Major Regional Airport Facilities

Santa Ana Airport (SNA): The Santa Ana Airport, also known as the John Wayne Airport, is approximately 13.6 miles north of the City. The airport is owned and operated by the County of Orange and is the primary airport serving the County of Orange region.

Long Beach Airport (LGB): The Long Beach Airport is located approximately 31.75 miles north of Laguna Niguel, in the City of Long Beach. This airport is categorized by the FAA as a primary commercial service, small hub airport.

Los Angeles International Airport (LAX): Los Angeles International Airport is approximately 49.38 miles northwest of the City. The airport is located west of Los Angeles and is the primary airport serving the Los Angeles region as well as the primary location for international connections for most of southern California.

[8] John Wayne Airport Orange County. *Airport Land Use Commission*, https://www.ocair.com/about/administration/airport-governance/commissions/airport-land-use-commission/, accessed February 27, 2024.

National Transportation Safety Board Aviation Accident Database

The National Transportation Safety Board (NTSB) Aviation Accident Database identifies a total of one historical aircraft accident in the City of Laguna Niguel.[9] The only recorded aircraft accident occurring within the City of Laguna Niguel is from November 16, 1975 (nonfatal). This incident involved a non-commercial flight from San Diego to Santa Ana and occurred during a controlled collision with the ground/water caused by adverse weather conditions.

4.3.1 References

John Wayne Airport Orange County, *Airport Land Use Commission*, https://www.ocair.com/about/administration/airport-governance/commissions/airport-land-use-commission/, accessed February 27, 2024.

National Transportation Safety Board, *CAROL Query*, https://data.ntsb.gov/carol-main-public/basic-search, accessed February 27, 2024.

[9] National Transportation Safety Board. *CAROL Query*, https://data.ntsb.gov/carol-main-public/basic-search, accessed February 27, 2024.

4.3 FIRE HAZARDS

This section addresses the hazards associated with fires in Laguna Niguel. The discussion of fire suppression resources, including fire station locations, is in Chapter 3, Utilities and Community Services. The current General Plan addresses the topics of fire hazards within the Seismic/Public Safety and Public Facilities Element.

4.3.1 Identifying Fire Hazards

Fuel Rank

Fuel rank is a ranking system developed by CAL FIRE that incorporates four wildfire factors: fuel model, slope, ladder index, and crown index.

- The U.S. Forest Service has developed a series of **fuel models**, which categorize fuels based on burn characteristics. These fuel models help predict fire behavior.
- In addition to fuel characteristics, **slope** is an important contributor to fire hazard levels. A surface ranking system has been developed by CAL FIRE, which incorporates the applicable fuel models and slope data. The model categorizes slope into six ranges: 0-10%, 11-25%, 26-40%, 41-55%, 56-75% and >75%. The combined fuel model and slope data are organized into three categories, referred to as surface rank. Thus, surface rank is a reflection of the quantity and burn characteristics of the fuels and the topography in a given area.
- The **ladder index** is a reflection of the distance from the ground to the lowest leafy vegetation for tree and plant species.
- The **crown index** is a reflection of the quantity of leafy vegetation present within individual specimens of a given species.

The surface rank, ladder index, and crown index for a given area are combined in order to establish a fuel rank of medium, high, or very high. Fuel rank is used by CAL FIRE to identify areas in the California Fire Plan where large, catastrophic fires are most likely.

The fuel rank data are used by CAL FIRE to delineate fire threat based on a system of ordinal ranking. Thus, the Fire Threat model creates discrete regions, which reflect fire probability and predicted fire behavior. The four classes of fire threat range from moderate to extreme.

4.3.2 Fire Hazard Severity Zones

The California Department of Forestry and Fire Protection (CAL FIRE) is responsible for mapping Fire Hazard Severity Zones (FHSZs) within State Responsibility Areas (SRA). FHSZs are classified as moderate, high, and very high. In addition, CAL FIRE must identify and recommend VFHSZ within any Local Responsibility Areas (LRA), which must be adopted by local jurisdictions. On March 24, 2025, CAL FIRE released updated LRA FHSZ maps for Southern California, including the City of Laguna Niguel. On June 3, 2025, the Laguna Niguel City Council adopted the updated state-mandated LRA FHSZ map for Laguna Niguel by ordinance.

The moderate, high, and very high zone classifications do not correspond to a specific risk or intensity of the fire; rather, they reflect a hazard score based on the factors that influence fire likelihood and fire behavior, such as fire history, fuel (e.g., flammable vegetation), terrain, and typical fire weather. The FHSZ maps are used by the State Fire Marshall as a basis for the adoption of applicable building code standards and are meant to help limit wildfire damage to structures through planning, prevention, and the application of risk reduction measures. Figure 4-2 shows the portions of the Planning Area within a FHSZ. As shown in Figure 4-2, LRA FHSZS in the City include zones designated as Very High, High, and Moderate, primarily located in the western and southern portions of the Planning Area, as well as south of Aliso Creek Road and east of Alicia Parkway. The Planning Area does not contain any FHSZ in an SRA; however, Aliso and Wood Canyons Wilderness Park, located immediately west of the City is an SRA designated VHFHSZ and Moderate FHSZ.

4.3.3 Regional Historic Fires

Historically, there have been few wildfires within and near Laguna Niguel. However, the County of Orange has experienced a number of major fires. Table 4-3, Major Wildfires in Orange County History, identifies the most significant historical fires in Orange County dating back to 1958 in terms of the amount of acreage claimed.

Table 4-3: Major Wildfires in Orange County History

Name	Year	Acres[1]
Steward	1958	69,444
Paseo Grande	1967	51,075
Indian	1980	28,938
Owl	1980	18,332
Gypsum	1982	19,986
Assist 108	1989	13,478
Laguna	1993	14,337
Ortega	1993	21,010
Sierra Peak	2006	10,515
Santiago	2007	28,517
Freeway Complex	2008	30,305
Silverado	2020	12,465
Blue Ridge	2020	13,694

SOURCE: COUNTY OF ORANGE AND ORANGE COUNTY FIRE AUTHORITY, LOCAL HAZARD MITIGATION PLAN, DECEMBER 2021.
NOTES: (1) MAJOR FIRES IN ORANGE COUNTY ARE DEFINED AS BURNING MORE THAN 10,000 ACRES IN TOTAL.

In addition to the fires listed in Table 4-3, the May 2022 Coastal Fire occurred in the City. The fire originated in Aliso and Wood Canyons Wilderness Park in the City of Laguna Beach and driven by strong winds spread to the Coronado Pointe neighborhood in Laguna Niguel.[10] The fire burned approximately 200 acres and destroyed 20 homes and damaged an additional 12 homes.

[10] City of Laguna Niguel, 2022. *Coastal Fire*. https://www.cityoflagunaniguel.org/1502/Coastal-Fire, accessed September 18, 2024.

4.3.4 Fire Hazards and Open Space

Figure 4-2 includes both the FHSZ map layer (LRAs) and the current General Plan Open Space land use designation layer. The map depicts the correlation between areas categorized as Very High, High, and Moderate Fire Severity Zones and Open Space. These areas are along the western and southern portions of Laguna Niguel, as well as the area east of Crown Valley Parkway.

4.3.5 References

California Department of Forestry and Fire Protection (CAL FIRE), *FHSZ Viewer*, https://egis.fire.ca.gov/FHSZ/, accessed March 25, 2025.

City of Laguna Niguel, 2022. *Coastal Fire*. https://www.cityoflagunaniguel.org/1502/Coastal-Fire, accessed September 18, 2024.

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

4.4 FLOODING

This section addresses the hazards associated with flooding in the Laguna Niguel. The discussion of storm drainage infrastructure is in Chapter 3, Utilities and Community Services. The discussion of hydrological conditions and water quality is in Chapter 5, Conservation. The current General Plan addresses the topics of flooding and flood hazards within the Public Facilities Element and Seismic/Safety Element. In addition, the Community Service Standards Element identifies level of service standards related to flood control facilities to prevent flooding.

4.4.1 Environmental Setting

Flooding is a temporary increase in water flow that overtops the banks of a river, stream, or drainage channel to inundate adjacent areas not normally covered by water.

The City is largely developed with suburban residential communities, commercial areas, and has natural scenic landscapes. The 2023 City of Laguna Niguel Local Hazard Mitigation Plan (LHMP) identifies the greatest flood risk within the City to be due to urbanized flooding, which generally results from damaged infrastructure, under engineered infrastructure, and/or blockage of infrastructure. For additional information on stormwater and drainage infrastructure see Chapter 5, Utilities and Community Services.

FEMA Flood Zones

The Federal Emergency Management Agency (FEMA) has a database that maps flood potential across the United States. FEMA mapping provides important guidance for cities in planning for flooding events and regulating development within identified flood hazard areas. FEMA's National Flood Insurance Program (NFIP) is intended to encourage State and local governments to adopt responsible floodplain management programs and flood measures. As part of the program, the NFIP defines floodplain and floodway boundaries that are shown on Flood Insurance Rate Maps (FIRMs). Special Flood Hazard Areas (SFHA) identified by FEMA are referred to as the 100-year flood hazard areas. A 100-year flood hazard area is defined as an area that will be inundated by a flood event having a one-percent chance of being equaled or exceeded in any given year.

As shown in Figure 4-3, the City includes several pockets of 100-year flood zones[11] and a few areas within 500-year flood zones in the northern portion of Laguna Niguel. The rest of the City is outside of these flood hazard zones, with a minimal risk of flooding.

[11] Federal Emergency Management Agency. *FEMA Flood Map Service Center*, https://msc.fema.gov/portal/search?AddressQuery=laguna%20niguel, accessed February 27, 2024.

Dam Inundation

According to the California Department of Water Resources Division of Safety of Dams, only one small portion of the City is located within a dam inundation area of the Sulphur Creek (No. 1012-7) dam, located along La Paz Road.[12] The Division of Safety of Dams categorizes the Sulphur Creek Dam as a Reinforced Concrete Tank with a "High" downstream hazard potential, meaning dam failure would be expected to cause loss of at least one human life. According to the 2022 *Dams Within Jurisdiction of the State of California*, published by the Division of Safety of Dams, the Sulphur Dam were given a condition assessment of "Satisfactory," meaning no existing or potential dam safety deficiencies are recognized. Figure 4-4 shows dam inundation areas within the City.

4.4.2 Flooding Hazards and Open Space

Figure 4-3, includes both the FEMA Flood Zone designations and the current General Plan Open Space land use designation layer. The multiple pockets of 100-year Flood Zones tend to be situated within or near Parks and Recreation and Open Space areas in Laguna Niguel.

4.4.3 References

California Department of Water Resources, Division of Safety of Dams. *Dam Breach Inundation Map Web Publisher,* https://fmds.water.ca.gov/webgis/?appid=dam_prototype_v2, accessed February 27, 2024.

California Department of Water Resources, Division of Safety of Dams. *Dams Within Jurisdiction of the State of California*, September 2022.

Federal Emergency Management Agency. *FEMA Flood Map Service Center*, https://msc.fema.gov/portal/search?AddressQuery=laguna%20niguel, accessed February 27, 2024.

[12] California Department of Water Resources, Division of Safety of Dams. *Dam Breach Inundation Map Web Publisher,* https://fmds.water.ca.gov/webgis/?appid=dam_prototype_v2, accessed February 27, 2024.

4.5 RESILIENCY PLANNING

This section covers environmental hazards associated with greenhouse gas emissions along with strategies for building resilience and adapting to them. For additional information on the environmental challenges associated with greenhouse gases, see Chapter 7, Conservation. Information in this section is sourced primarily from the State's *Fourth Climate Change Assessment* (2019).

The current General Plan does not contain goals or policies specific to the environmental challenges associated with greenhouse gas emissions (GHGs) but does contain several goals and policies that indirectly support resiliency planning. The Circulation Element contains policies that support an improved transit system and increase active modes of transportation in Laguna Niguel. The Public Facilities Element contains resilient planning strategies that would help the City address environmental challenges associated with increased GHGs, such as risks associated with flooding and fire hazards.

4.5.1 Background

The rise in GHG emissions largely due to human activities has impacted environments both locally and globally. These changes are manifesting in varied environmental health and infrastructure consequences for different countries, regions, and states, necessitating a change in public policy decision-making to adapt to a new environment. Resiliency planning presents strategies that would help ensure that communities, ecosystems, and built infrastructure are better equipped to withstand the environmental impacts associated with GHG emissions.

Over the next century, increasing atmospheric GHG concentrations are expected to cause a variety of changes to global climate conditions, including sea level rise and storm surge in coastal areas, increased riverine flooding, and higher temperatures more frequently (leading to extreme heat events and wildfires), particularly in inland areas. Local impacts stemming from GHG related conditions range from impacts to water quality and supply, public health, air quality, wildfires, and infrastructure. While weather changes are a normal, short-term change in atmospheric condition, climate change refers to changes in long-term averages in atmospheric condition. Scientists attribute recent environmental trends to human expansion of greenhouse gases into the atmosphere. This environmental hazard can cause extreme weather conditions, including heat waves, more frequent droughts, heavier rainfall, and more powerful hurricanes.

Because local governments largely determine the shape of development through land use plans, regulations, and implementing decisions, local governments play an important role in developing climate change strategies, including resilience planning and adaptation. Inasmuch as local governments play an important role in adaptation strategies through local land use plans and policies, many resiliency planning strategies will need to be coordinated as part of a larger regional or statewide strategy requiring cooperation by many local governments and decision-making and regulatory bodies.

4.5.2 Environmental Setting

Communities in California are increasingly vulnerable to the effects of climate change. California's *Fourth Climate Change Assessment* identifies the Los Angeles Region (which includes Ventura, Los Angeles, and Orange Counties, along with adjacent urbanized portions of San Bernardino and Riverside Counties) as especially vulnerable to humans since approximately half the population of the State calls the region home. The report's key projected climate changes include:

- Continued future warming over the Los Angeles Region. Across the region, average maximum temperatures are projected to increase by around 4-5 degrees F by mid-century, and 5-8 degrees F by late-century.
- Extreme temperatures are expected to increase. The hottest day of the year may be up to 10 degrees F warmer for many locations across the Los Angeles Region by late-century under the "business-as-usual" scenario. The number of extremely hot days is also expected to increase across the region.
- Despite small changes in average precipitation, dry and wet extremes are both expected to increase. By the late-21st century, the wettest day of the year is expected to increase across most of the Los Angeles Region, with some locations experiencing 25-30 percent increases under the "business-as-usual" scenario. Increased frequency and severity of atmospheric river events are also projected to occur.
- Sea levels are projected to continue to rise in the future, but there is a large range based on emissions scenarios and uncertainty in feedback in the climate system. Roughly 1-2 feet of sea level rise is projected by mid-century, and the most extreme projections lead to 8-10 feet of sea level rise by the end of the century.
- Projections indicate that wildfire may increase over southern California, but there remains uncertainty in quantifying future changes of burned area over the Los Angeles Region.

Other studies have indicated that a variety of changes to local climate conditions as a result of climate change are expected to occur, leading to several local conditions that may affect the region. For the City of Laguna Niguel, possible future local conditions may include increased urban flooding (from overwhelmed stormwater infrastructure), higher temperatures, more frequent heat waves (leading to extreme heat events), water quality and water supply impacts, impacts to regional air quality (particularly from wildfires), and other public health impacts.

Flooding

Precipitation change is a climate variable that is directly affected by changes in global atmospheric and oceanic temperatures. Projected changes in precipitation include annual trend changes as well as extreme precipitation events. Although the City may not be impacted by riverine flooding, which occurs when heavy rainfall causes rivers or creeks to overtop their banks and inundate surrounding areas, it is subject to urban flooding which can occur when local stormwater infrastructure is overwhelmed during extreme precipitation events. According to California's *Fourth Climate Change Assessment*, differing models generally project small changes in precipitation over the Los Angeles Region, which exhibits highly variable precipitation from year to year. Nonetheless, both dry and wet extremes are expected to increase in the region. More extreme storms and precipitation events could cause urban flood risks to worsen, increasing the likelihood of damaging infrastructure, increasing erosion, and overwhelming sewage treatment systems, which may reduce water quality and impact public health.

Water Supply and Quality

According to the *Climate Change and Health Profile Report – Orange County*, overall mean precipitation amounts are expected to decrease slightly by 2050. It is also expected that climate change will likely impact water demand, water supply, and water quality of both surface and ground water. The same study notes that for the South Coast Region, low-lying coastal areas will lose up to 2 inches of precipitation by 2050 and 3-5 inches by 2090, while higher elevations will see a drop of 4-5 inches by 2050 and 8-10 inches by 2090. In the South Coast Region, the March snowpack in the San Gabriel Mountains is projected to decrease from the 0.7-inch level in 2010 to zero by the end of the century. With resulting decreased stream flows and higher temperatures, impacts could include a reduction of fish habitat, increased surface water temperatures, pollutant levels, and sedimentation, intensified algal growth, and subsequently, more harmful algal blooms. Through sea level rise, salt water may intrude into coastal aquifers thus reducing quality and quantity of water supply. The decreased water quality could further deteriorate as pollutant concentrations increase due to reduced water levels and recharge from drought and lack of snowpack.

Extreme Heat

Temperature (near surface) is a variable that is directly affected by the rise in GHG emissions and oceanic conditions. While trends in average annual temperature are an important indicator of climate change, extreme temperature events have greater impacts on society due to their episodic nature. Therefore, vulnerability and risk assessments tend to specifically focus on extreme heat events and not on average temperature changes. While extreme heat events can have various durations, Cal-Adapt defines an extreme heat event as a period of four or more consecutive extreme heat days.[13] Cal-Adapt defines an extreme heat day in a given region as a day in April through October where the maximum temperature exceeds the 98th historical percentile of maximum temperatures for that region based on daily temperature data from 1961 to 1990.[14] The 98th historical percentile of maximum temperatures varies by locality and inland areas tend to be at a greater risk of extreme heat events when compared to areas near the coast.

As noted in California's *Fourth Climate Change Assessment*, the number of extreme heat days in southern California is expected to increase considerably by the middle of the century as a result of climate change. Extreme heat is one of the most significant health impacts of climate change and already causes more deaths each year in the United States than floods, storms, and lightning combined. Increasing high heat days from climate change can have a number of impacts on communities, including heat-related illness and death, and can also exacerbate certain existing medical conditions. The magnitude of impacts depends on many factors, including geographic location, demographics, and availability of adaptive strategies such as air conditioning. It is also noted that more frequent and intense high heat events would result in a higher electricity demand, which could result in blackouts with potentially devastating results.

[13] Cal-Adapt, *Glossary*, https://cal-adapt.org/help/glossary/, accessed February 27, 2024.

[14] Cal-Adapt, Extreme Heat Days & Warm Nights, https://cal-adapt.org/tools/extreme-heat, accessed February 27, 2024.

Elements of the built environment can contribute to heat-related health impacts. Specifically, high concentrations of impervious surfaces such as pavements and roofs and minimal tree canopy and green space create "urban heat islands" in heavily urbanized areas. Urban heat islands in non-tropical regions experience temperatures up to 5.4°F. Extreme heat is also significant because of how it contributes to other climate impacts: extreme heat increases concentrations of ground-level ozone, contributing to poor air quality. Extreme heat and drought decrease soil moisture and increase plant mortality, factors that contribute to larger wildfires and poorer air quality. Plant die-offs also reduce available shade and evaporative cooling, raising surrounding temperatures and reducing the thermal comfort of pedestrians.

Increased Risk and Spread of Diseases

As discussed in the *Climate Change and Health Profile Report – Orange County*, in addition to the health impacts related to air and water quality, warmer temperatures and drought conditions can contribute to the spread of diseases by aiding development and spread of the vectors that transmit them. A vector-borne disease (VBD) is one caused by a virus, bacteria, or protozoan that spends part of its lifecycle in a host species (e.g., mosquitoes, ticks, fleas, rodents), which subsequently spreads the disease to other animals and people.

Regional research assessments have previously concluded that environmental hazards from GHG emissions and variability are highly likely to influence current VBD spread, including both short-term outbreaks and shifts in long-term disease trends. For example, as temperatures rise, changes in aquatic environments could occur, such an increase in harmful algal blooms, which lead to an increase in foodborne and waterborne illnesses.

In Orange County, the Aedes mosquitoes are one of the invasive species infesting the County neighborhoods.[15] These invasive mosquitoes bite aggressively during the day and can spread a variety of disease, including chikungunya, yellow fever, and dengue, as seen with recent outbreaks in Florida and Texas. Once established, mosquitoes can reproduce in extremely small amounts of water and are very difficult to control.

The California Department of Public Health further notes three vector-borne diseases that climate change may impact in the State: hantavirus, malaria, and West Nile virus (WNV). As the ecology of vectors change with climate, exposure to disease in people may increase significantly.

4.5.3 Climate Change and Resilience Planning Efforts

State Efforts in Climate Adaptation

To support local and regional adaptation planning efforts, the State has developed an integrated set of policies and tools. Key resources include documents that summarize climate impacts in sectors and regions and provide adaptation guidance, such as California's *Fourth Climate Change Assessment*, which summarizes climate impacts and adaptation needs at the State and regional level for use by local decision-makers; and the *Safeguarding California Plan*, which provides a roadmap for the State's climate action goals and how those objectives will be achieved. State programs, such as the Integrated Climate Adaptation and Resiliency Program, provide actionable guidance, decision support tools, and technical assistance, in addition to climate resilience grant programs. Additionally, Cal-Adapt was designed to be a web-based climate adaptation planning tool for local planning efforts with downscaled climate change scenarios and research for regions within California.

[15] Orange County Mosquito and Vector Control District. *Invasive Aedes Mosquitoes,* https://www.ocvector.org/invasive-aedes-mosquitoes. Accessed February 27, 2024.

Local and Regional Efforts in Climate Adaptation

Development of GHG emissions inventories for the City are expected to occur in future years, including as part of the City's effort to comprehensively update its General Plan. GHG emissions within the City boundaries are closely tied to trends within the region of Orange County and the State of California. In general, the biggest GHG emissions sectors (e.g., building energy and on-road transportation) tend to be affected most heavily by State and regional-level regulations and initiatives (as opposed to local policies). This means that the local government has limited control over the magnitude of local-level GHG emissions. Nevertheless, the City has control over policy decisions that can substantially reduce the community's overall GHG emissions. For example, the local government has substantial control over current and future land uses, parking policies, building energy efficiency and renewable energy requirements, recycling initiatives, and water and wastewater reduction plans and policies. The City also has substantial control over its own government operations, including energy usage within County-operated buildings, County vehicle fleet usage, and street lighting. The City will continue to work closely with neighboring jurisdictions and Orange County to reduce community-wide and municipal-level GHG emissions under its control.

4.5.4 References

California Climate Change Assessment, *California's Fourth Climate Change Assessment: Los Angeles Region Report*, 2018.

California Department of Public Health, *Climate Change and Health Profile Report – Orange County*, 2017.

California Governor's Office of Emergency Services, *California Adaptation Planning Guide*, June 2020.

California Natural Resources Agency, *Safeguarding California Plan: 2018 Update*, January 2018.

Intergovernmental Panel on Climate Change, *Climate Change 2023: Synthesis Report (AR6)*, 2023.

Orange County Mosquito and Vector Control District. *Invasive Aedes Mosquitoes*, https://www.ocvector.org/invasive-aedes-mosquitoes. Accessed February 27, 2024.

4.6 NOISE AND VIBRATION

This section provides a discussion of the regulatory setting and a general description of existing noise sources in the City. The analysis in this section is primarily from the *General Plan Update Noise Impact Study: City of Laguna Niguel* prepared by MD Acoustics and dated May 2025.

4.6.1 Environmental Setting

Fundamentals of Noise

Sound is a disturbance created by a moving or vibrating source and is capable of being detected by the hearing organs. Noise is a type of sound that is loud, unpleasant, unexpected, or unwanted.

A continuous sound is described by its frequency (pitch) and its amplitude (loudness). Frequency relates to the number of pressure oscillations per second. Low-frequency sounds are low in pitch (bass sounding) and high-frequency sounds are high in pitch (squeak). These oscillations per second (cycles) are commonly referred to as Hertz (Hz). The human ear is capable of hearing from the bass pitch starting at 20 Hz to the high pitch of 20,000 Hz.

The amplitude of a sound determines its loudness. The loudness of sound increases or decreases as the amplitude increases or decreases. Sound pressure level (SPL or Lp) is used to describe in logarithmic units the ratio of actual sound pressures to a reference pressure squared. These units are called decibels (abbreviated dB). Because decibels are on a logarithmic scale, sound pressure levels cannot simply be added or subtracted arithmetically. When two sounds of equal SPL are combined, they will produce an SPL 3 dB greater than the single SPL. In other words, sound energy that is doubled produces a 3 dB increase. If two sounds differ by approximately 10 dB, the higher sound level is the predominant sound.

In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, and it perceives a sound within that range as being more intense than a sound with a higher or lower frequency with the same magnitude. As such, A-scale weighting is typically used for measuring community noise and is reported in terms of the A-weighted decibel (dBA). The A-scale was designed to account for the frequency-dependent sensitivity of the human ear.

Table 4-4: Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: California Department of Transportation (Caltrans), Technical Noise Supplement to the Traffic Noise Analysis Protocol, 2013.

Noise Descriptors

A-Weighted Sound Level (dBA): The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high-frequency components of the sound in a manner similar to the response of the human ear. A numerical method of rating human judgment of loudness.

Ambient Noise Level: The composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

Community Noise Equivalent Level (CNEL): The average equivalent A-weighted sound level during a 24-hour day, obtained after the addition of five (5) decibels to sound levels in the evening from 7:00 to 10:00 PM and after the addition of ten (10) decibels to sound levels in the night between 10:00 PM and 7:00 AM.

Decibel (dB): A unit for measuring the amplitude of a sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micro-pascals.

Equivalent Sound Level (LEQ): The sound level corresponding to a steady noise level over a given sample period with the same amount of acoustic energy as the actual time-varying noise level. The energy average noise level during the sample period.

L(n): The A-weighted sound level exceeded during a certain percentage of the sample time. For example, L10 in the sound level exceeded 10 percent of the sample time. Similarly, L50, L90, L99, etc.

Effects of Noise on People

In general, the human ear can barely perceive a change in the noise level of 3 dB. As shown in Table 4-5, a change in 5 dB is readily perceptible, and a change in 10 dB is perceived as being twice or half as loud. As previously discussed, a doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g., doubling the volume of traffic on a highway) would result in a barely perceptible change in sound level.

Table 4-5: Perceived Changes in Noise Levels

Changes in Intensity Level, dBA	Changes in Apparent Loudness
1	Not perceptible
3	Just perceptible
5	Clearly noticeable
10	Twice (or half) as loud

SOURCE: CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS), TECHNICAL NOISE SUPPLEMENT TO THE TRAFFIC NOISE ANALYSIS PROTOCOL, 2013.

As sound propagates from a source it spreads geometrically. Sound from a small, localized source (i.e., a point source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates at a rate of 6 dB per doubling of distance. The movement of vehicles down a roadway makes the source of the sound appear to propagate from a line (i.e., line source) rather than a point source. This line source results in the noise propagating from a roadway in a cylindrical spreading versus a spherical spreading that results from a point source. The sound level attenuates for a line source at a rate of 3 dB per doubling of distance.

Research has demonstrated that atmospheric conditions can have a significant effect on noise levels when noise receivers are located 200 feet or more from a noise source. Wind, temperature, air humidity, and turbulence can further impact how far sound can travel.

Ground-Borne Vibration Fundamentals

Ground-borne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically only cause a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically only an annoyance to people indoors, where the associated effects of the shaking of a building can be notable. Ground-borne noise is an effect of ground-borne vibration and mainly exists indoors since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

Vibration Descriptors

Peak particle velocity (PPV): The maximum instantaneous peak in vibration velocity, typically given in inches per second.

Root mean squared (RMS): Used to denote vibration amplitude.

Vibration level (VdB): Describes the vibration level for a vibration source.

Effects of Vibration on People

Typical human reaction and effect on buildings due to ground-borne vibration is shown in Table 4-6.

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Outdoor sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible groundborne noise or vibration.

Table 4-6: Typical Human Reaction and Effect on Buildings Due to Ground-Borne Vibration

Vibration Level Peak Particle Velocity (PPV)	Human Reaction	Effect on Buildings
0.006–0.019 in/sec	Threshold of perception, possibility of intrusion	Vibrations unlikely to cause damage of any type
0.08 in/sec	Vibrations readily perceptible	Recommended upper level of vibration to which ruins and ancient monuments should be subjected
0.10 in/sec	Level at which continuous vibration begins to annoy people	Virtually no risk of "architectural" (i.e., not structural) damage to normal buildings
0.20 in/sec	Vibrations annoying to people in buildings	Threshold at which there is a risk to "architectural" damage to normal dwelling – houses with plastered walls and ceilings
0.4–0.6 in/sec	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

SOURCE: CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS), CALTRANS TRANSPORTATION AND CONSTRUCTION VIBRATION GUIDANCE MANUAL, 2020.

4.6.2 Existing Noise Levels

Existing land uses within the Project Area include single and multiple-family residential development, commercial, industrial, open space, and public facility land uses. Noise sources associated with existing land uses include residential maintenance, parking lot noise, heating, and cooling system (HVAC) noise, property maintenance noise, trash truck noise, loading and unloading noise, and recreational noise.

Five long-term 24-hour noise measurements and eight short-term 15-minute noise measurements were conducted throughout the Planning Area to document the existing noise environment. Figure 4-5, *Noise Measurement Locations*, shows the locations of these measurements.

Eight short-term noise measurements (15-minute) were taken on February 18 and February 19, 2025, in order to document the daytime Leq level at different locations throughout the Planning Area. Measured noise levels ranged between 47.2 and 68.0 dBA Leq. Vehicle noise along Crown Valley Parkway, Golden Lantern, and Niguel Road were the primary sources of ambient noise. Short-term noise measurement results are presented in Table 4-7, *Short-Term Noise Measurement Summary*.

Table 4-7: Short-Term Noise Measurement Summary

Noise Measurement Location	Approximate Location	Start Time	A-Weighted Sound Level (dBA)							
			Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)	L(90)
ST1	27611 La Paz Rd	12:40 PM	67.6	80.3	53.1	75	71.9	68.4	64.2	56.6
ST2	24682 Monita Circle	12:12 PM	66.6	80.5	49	74.9	70.2	67	63	56.4
ST3	25891 Crown Valley Pkwy	11:15 PM	74.2	90.4	63	79.5	77.9	75	71.4	66.7
ST4	28922 Golden Lantern	10:45 PM	61.2	74.8	49.2	66.9	64.2	61.9	59.7	54
ST5	28282 Sorrento	9:55 PM	67.6	78.9	57.7	74.9	71.6	67.8	64.9	61
ST6	25193 Chapparosa Park Rd	9:32 PM	47.2	61.8	37.3	53.2	50.5	47.3	45.2	41.3
ST7	25189 Beacon Hill Way	9:00 PM	68	78.5	41.4	76.1	73.3	68.4	62.9	52
ST8	32525 Niguel Rd	8:29 PM	65.8	81.7	54.5	72	69.4	66.8	64	58.5

Source: MD Acoustics, LLC, City of Laguna Niguel General Plan Update Noise Impact Study, May 5, 2025.

Notes: 15-minute duration.

dBA = A-weighted decibels; Leq = equivalent noise level; Lmax = maximum noise level; Lmin = minimum noise level; Ln = noise level exceeded n percent of the measurement period.

Five long-term noise measurements (24 consecutive hours) were taken on February 18 through February 19, 2025, in order to document the CNEL at different locations throughout the Planning Area. As shown in Table 4-8, *Long-Term Noise Measurement Summary*, the measured noise was 72.7 dBA CNEL at 70 feet from the centerline of Pacific Park Drive and 150 feet from the centerline of Alicia Parkway, 75.6 dBA CNEL at 64 feet from the centerline of Alicia Parkway, 62.3 dBA CNEL at 130 feet from the centerline of Crown Valley Parkway, 68.1 dBA CNEL at 35 feet from the centerline of Pacific Island Drive, and 71.6 dBA CNEL at 70 feet from the centerline of Golden Lantern and 105 feet from the centerline of Camino Del Avion. The primary noise source was vehicle traffic. Table 4-8 also outlines the daytime (7:00 a.m. to 7:00 p.m.), evening (7:00 p.m. to 10:00 p.m.), and nighttime (10:00 p.m. to 7:00 a.m.) Leq levels at each location. These represent the average level over each time period (day/evening/night).

Table 4-8: Long-Term Noise Measurement Summary

Noise Measurement Location	Approximate Location	Description	A-Weighted Sound Level (dBA)			
			Daytime Leq	Evening Leq	Nighttime Leq	CNEL
LT1	2 Brandy Lane	Alicia Pkwy and Pacific Park Dr traffic noise	70.6	69.5	64.0	72.7
LT2	27745 Alicia Pkwy	Alicia Pkwy (south of Avila Rd) traffic noise	73.9	71.3	67.0	75.6
LT3	23732 Hillhurst Dr	Crown Valley Pkwy traffic noise	62.8	56.4	52.0	62.3
LT4	31412 Paseo De La Playa	Pacific Island Dr traffic noise	68.1	64.2	57.6	68.1
LT5	32411 Golden Lantern	Golden Lantern and Camino Del Avion traffic noise	71.8	65.4	61.8	71.6

SOURCE: MD ACOUSTICS, LLC, CITY OF LAGUNA NIGUEL GENERAL PLAN UPDATE NOISE IMPACT STUDY, MAY 5, 2025.

NOTES: 24-HOUR DURATION.

DBA = A-WEIGHTED DECIBELS; LEQ = EQUIVALENT NOISE LEVEL; LMAX = MAXIMUM NOISE LEVEL; LMIN = MINIMUM NOISE LEVEL; LN = NOISE LEVEL EXCEEDED N PERCENT OF THE MEASUREMENT PERIOD.

The primary sources of noise in the Planning Area are transportation-related noises. Major roadways create ambient noise levels that affect the overall quality of life in the community. Modeled existing noise levels provided in Table 4-9, *Existing Short-Term Noise Measurement Summary*, and on Figure 4-6, *Existing Roadway Noise Level Contours (CNEL)*.

It should be noted that the modeled noise contours do not take into account factors such as existing buildings, walls, etc., that may reduce or, in some cases, amplify or reduce noise sources. The model also assumes hard site, when in reality, some areas of the City have soft site ground, such as grass or dirt, which would result in reduced noise levels. Therefore, the modeled noise levels are conservative. Measured noise levels provided in Table 4-7 and Table 4-8 do take into account existing structures, as well as other existing noise sources.

Those areas in the City that currently experience sound levels greater than 65 dBA CNEL are typically near major vehicular transportation corridors. Traffic noise levels typically depend on three factors: (1) the volume of traffic, (2) the average speed of traffic, and (3) the vehicle mix (i.e., the percentage of trucks versus automobiles in the traffic flow). Vehicle noise includes noises produced by the engine, exhaust, tires, and wind generated by taller vehicles. Other factors that affect the perception of traffic noise include the distance from the highway, terrain, heavy vegetation, and natural and structural obstacles. While tire noise from automobiles is generally located at ground level, some truck noise sources may emanate from 12 feet or more above the ground.

Table 4-9: Existing Short-Term Noise Measurement Summary

Roadway	Segment Limits	CNEL, dBA at 50 feet	Distance to Contour (feet)			
			CNEL, 70 dBA	CNEL, 65 dBA	CNEL, 60 dBA	CNEL, 55 dBA
Pacific Park Drive	Alicia Parkway to La Paz Road	72.8	95	299	946	2,992
Alicia Parkway	Pacific Park Drive to Avila Road	73.7	116	368	1,165	3,684
La Paz Road	Pacific Park Drive to Avila Road	69.6	45	143	451	1,426
Moulton Parkway	North of Avila Road	72	79	250	790	2,498
Alicia Parkway	Avila Road to Aliso Creek Road	73.4	109	345	1,090	3,446
La Paz Road	Avila Road to Aliso Creek Road	70	50	158	499	1,577
Moulton Parkway	Avila Road to Aliso Creek Road	72.4	87	276	874	2,763
Aliso Creek Road	Alicia Parkway to La Paz Road	72.5	89	283	894	2,827
Aliso Creek Road	La Paz Road to Moulton Parkway	67.4	27	87	275	869
Alicia Parkway	Aliso Creek Road to Highlands Avenue	75.3	170	539	1,703	5,386
La Paz Road	Aliso Creek Road to Rancho Niguel Road	68.5	35	112	353	1,116
Moulton Parkway	Aliso Creek Road to Rancho Niguel Road	74.3	136	429	1,356	4,288
Rancho Niguel Road	Moulton Parkway to Greenfield Drive	66.4	22	69	218	690
Crown Valley Parkway	Greenfield Drive to Cabot Road	74.6	144	455	1,438	4,546
Crown Valley Parkway	Cabot Road to Forbes Road	78.1	324	1,024	3,240	10,244
Moulton Parkway	Rancho Niguel Road to Crown Valley Parkway	72.5	88	279	883	2,793
Crown Valley Parkway	Moulton Parkway/Golden Lantern to Greenfield Drive	75.4	173	547	1,728	5,465
Paseo de Colinas	Golden Lantern to Cabot Road	70.3	54	171	540	1,709
Paseo de Colinas	Cabot Road and Camino Capistrano	68.9	39	124	392	1,240
Alicia Parkway	Highlands Avenue to Niguel Road	75.5	177	559	1,766	5,586
Crown Valley Parkway	La Paz Road to Moulton Parkway/Golden Lantern	73.1	102	321	1,016	3,213
Golden Lantern	Crown Valley Parkway to Paseo de Colinas	71.9	78	246	778	2,460

Crown Valley Parkway	Niguel Road to La Paz Road	73	101	319	1,009	3,189
Golden Lantern	Paseo de Colinas to Marina Hills Drive/Camino Los Padres	74	126	398	1,258	3,978
Crown Valley Parkway	Alicia Parkway to Club House Drive	73.4	109	343	1,086	3,434
Niguel Road	Crown Valley Parkway to Marina Hills Drive	69.4	43	137	434	1,371
Pacific Island Drive	Club House Drive to Starview Lane	64	12	39	125	395
Niguel Road	Marina Hills Drive to Club House Drive	70.1	52	163	516	1,632
Golden Lantern	Chapparosa Park Road to Beacon Hill Way	71.9	78	247	781	2,471
Crown Valley Parkway	Club House Drive to Pacific Island Drive/Camino Del Avion	74.1	128	406	1,284	4,016
Niguel Road	Ridgeway Avenue to Camino Del Avion	70.1	51	161	510	1,614
Golden Lantern	Beacon Hill Way to Camino Del Avion	72.5	89	280	886	2,803
Camino Del Avion	Crown Valley Parkway to Niguel Road	68	31	99	315	995
Camino Del Avion	Niguel Road to Golden Lantern	69.7	46	147	463	1,465

Source: MD Acoustics, LLC, City of Laguna Niguel General Plan Update Noise Impact Study, May 5, 2025.

Notes: Exterior noise levels calculated at 5-feet above ground. Noise levels calculated from centerline of subject roadway. Contour distances do not take into account potential noise reduction from existing barriers such as buildings, walls or berms as a worst-case scenario for planning screening purposes. Overall levels are likely lower at sensitive receptors.

Airport and Aircraft Noise

There are no airports located within the Project Area, and the Project Area is not located within any airport noise contours. The closest airport to the Project Area is the John Wayne Airport, located over 10 miles northwest of the Project Area. The noise contours associated with airports do not encroach into the Project Area.

4.6.3 Existing Vibration

The main sources of vibration in the Planning Area are related to vehicles, construction, and railway. Typical roadway traffic, including heavy trucks, rarely generates vibration amplitudes high enough to cause structural or cosmetic damage. However, there have been cases in which heavy trucks traveling over potholes or other discontinuities in the pavement have caused vibration high enough to result in complaints from nearby residents. These types of issues typically can be resolved by smoothing the roadway surface.

Construction activities that produce vibration perceived by adjacent land uses include the use of vibratory equipment, large bulldozers, and pile drivers. The primary source of vibration during construction is usually from a bulldozer. A large bulldozer has a peak particle velocity of 0.089 inches per second (87 VdB) at 25 feet.

The LOSSAN rail corridor runs from San Diego to Los Angeles and carries freight, including through the Planning Area. One Metrolink line runs through the northeast portion of the City along Camino Capistrano. According to the Federal Railroad Administration Crossing Inventory Forms, there are 49 daytime and 17 nighttime passenger trains that pass through the City each day at a maximum of 90 MPH. Existing buildings are about 80 feet from the centerline of the railway. Therefore, the expected maximum vibration at these buildings is 75 VdB (0.020 inches per second).

4.6.4 References

California Department of Transportation (Caltrans), *Caltrans Transportation and Construction Vibration Guidance Manual*, 2020.

California Department of Transportation (Caltrans), *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, 2013.

MD Acoustics, LLC, *City of Laguna Niguel General Plan Update Noise Impact Study*, May 5, 2025.

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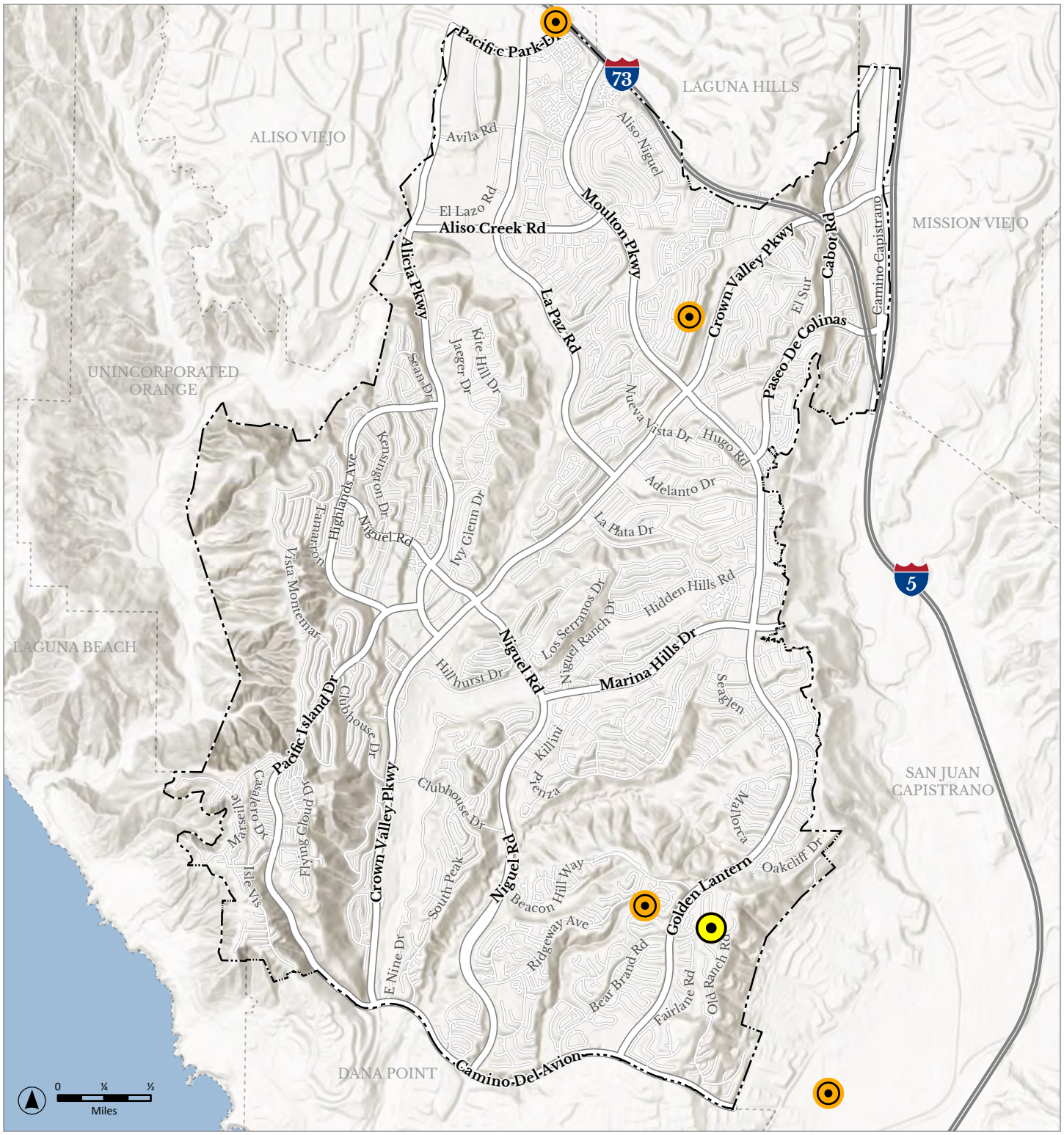


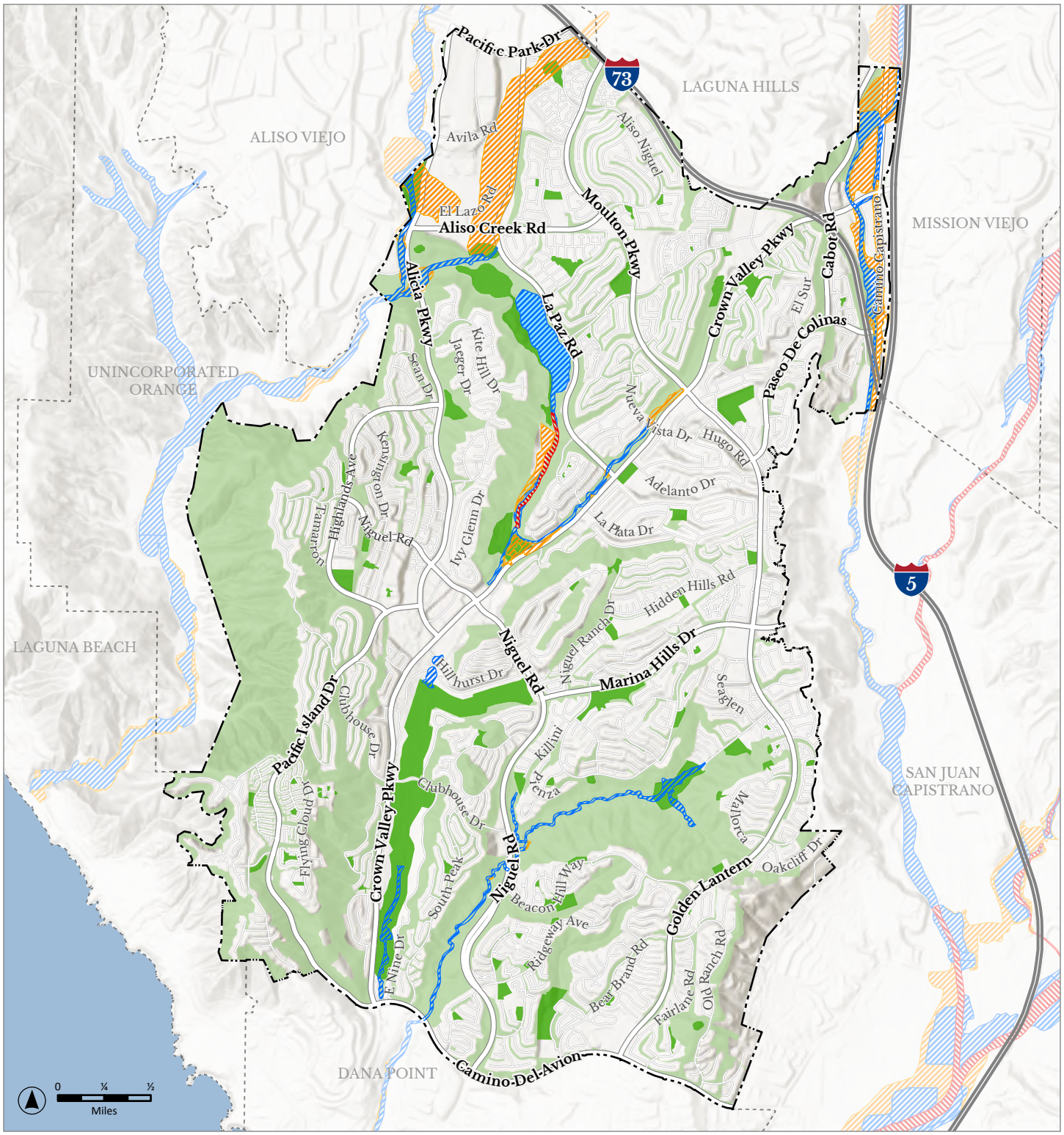
Data sources: CalGEM 10-2-2023; City of Laguna Niguel; Orange County GIS.

Prepared for the City of Laguna Niguel by De Novo Planning Group
October 2, 2023

LEGEND

- Laguna Niguel City Boundary
- Other Jurisdictions
- Idle Oil and Gas
- Plugged Dry Hole

Figure 4-1.
Oil and Gas Wells



Data sources: City of Laguna Niguel Official General Plan Map, 9-11-2023; FEMA NFHL_06059C 03/12/2021; Orange County GIS.

Prepared for the City of Laguna Niguel by De Novo Planning Group
May 22, 2025

LEGEND

Laguna Niguel City Boundary

General Plan Land Use

- PR: Parks and Recreation
- OS: Open Space
- Water

FEMA Flood Zone Designation

- 100-year Flood Zone
- 500-year Flood Zone
- Regulatory Floodway

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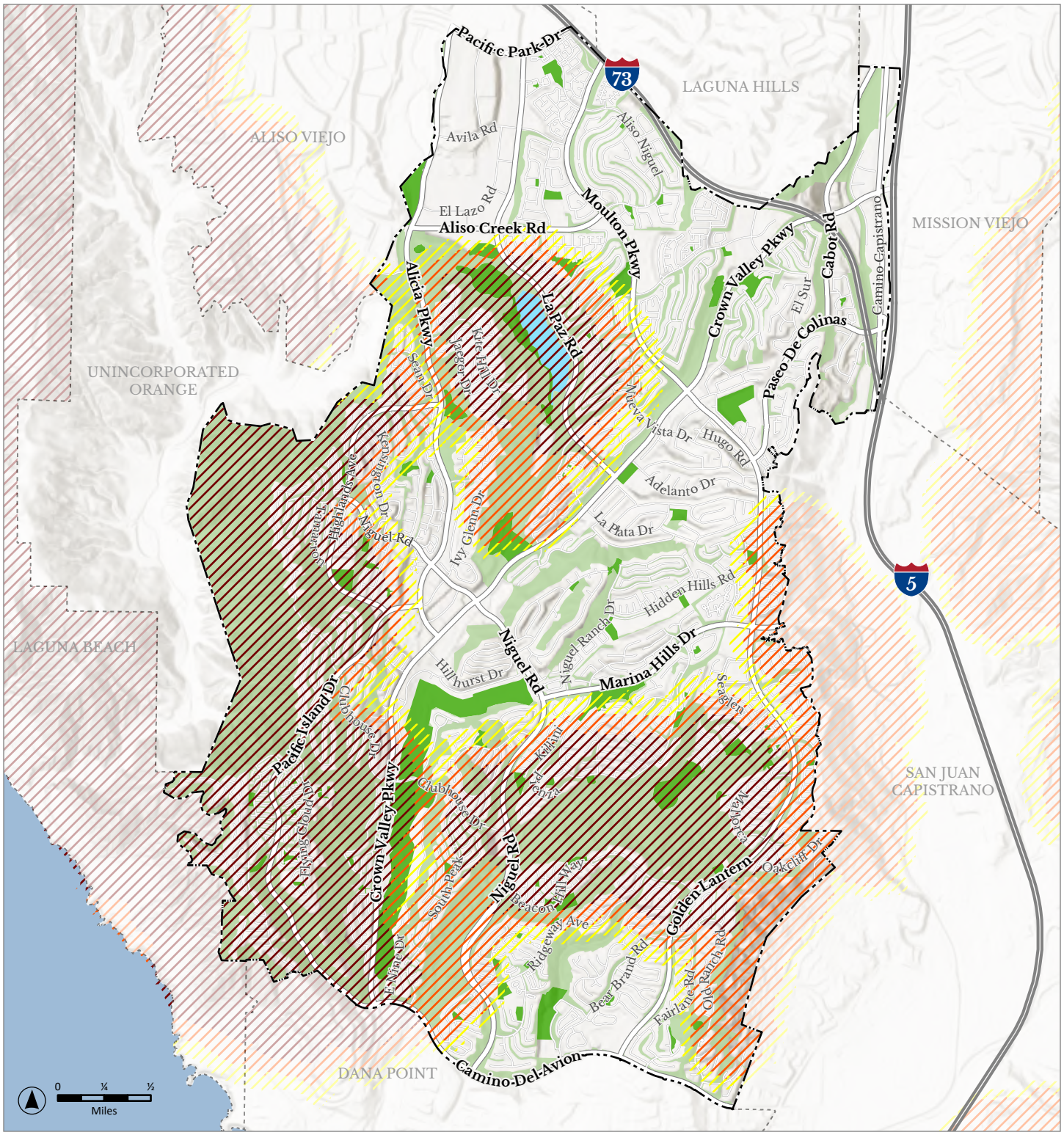
LAGUNA NIGUEL
GENERAL PLAN UPDATE

Figure 4-3

FEMA Flood Zones with Parks and Open Space



Data sources: City of Laguna Niguel Official General Plan Map, 9-11-2023; CALFIRE/State Office of the Fire Marshall, Local Responsibility Areas effective March 24, 2025; Orange County GIS.

Prepared for the City of Laguna Niguel by De Novo Planning Group May 22, 2025

LEGEND

Laguna Niguel City Boundary

General Plan Land Use

- PR: Parks and Recreation
- OS: Open Space
- Water

Fire Hazard Severity Zones in Local Responsibility Areas

- Very High
- High
- Moderate

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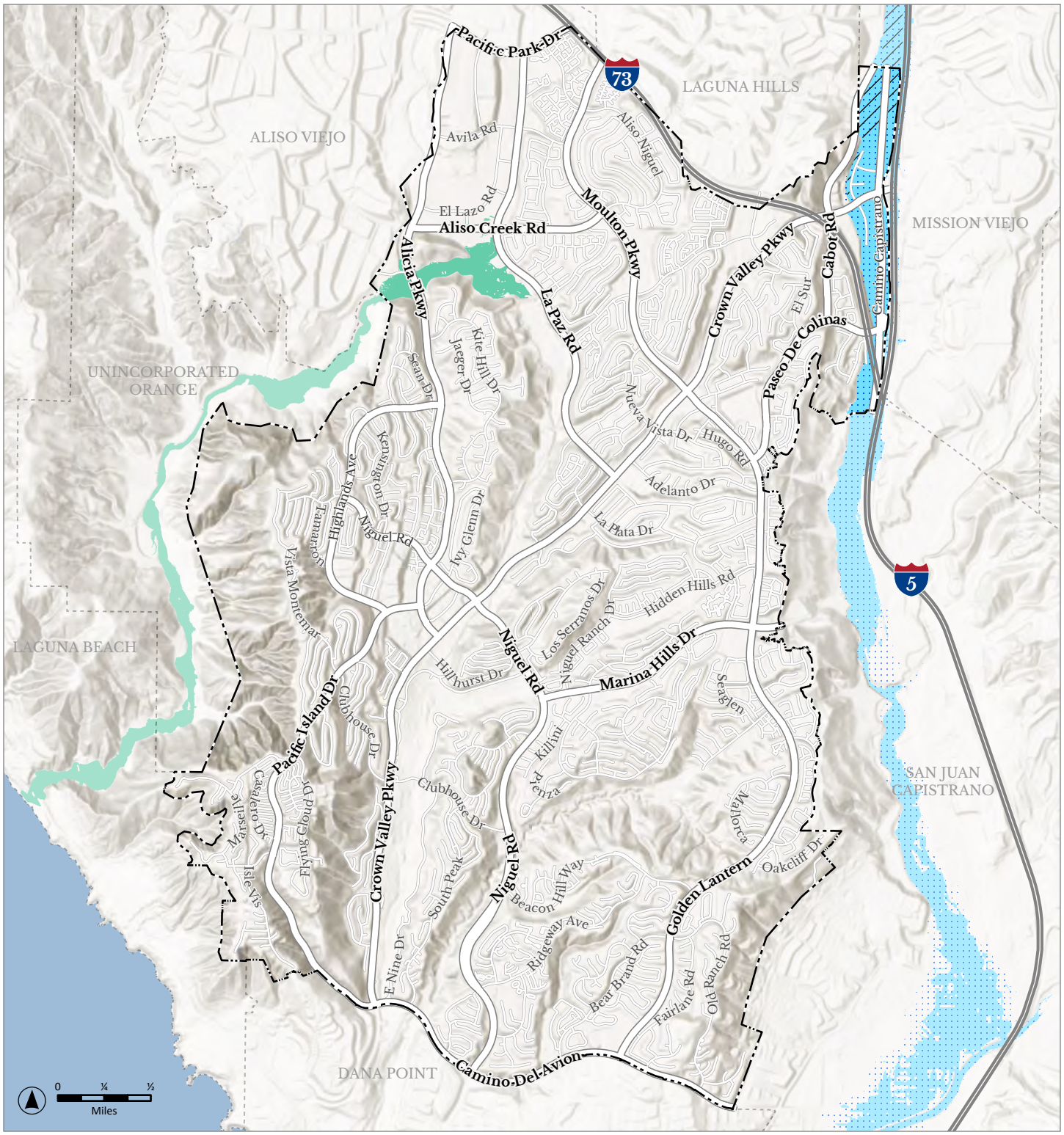
Figure 4-2

Fire Hazard Severity Zones with Parks and Open Space



Data sources: DWR Dam Breach Inundation Map 4-1-2023; City of Laguna Niguel; Orange County GIS.

Prepared for the City of Laguna Niguel by De Novo Planning Group
October 2, 2023

LEGEND

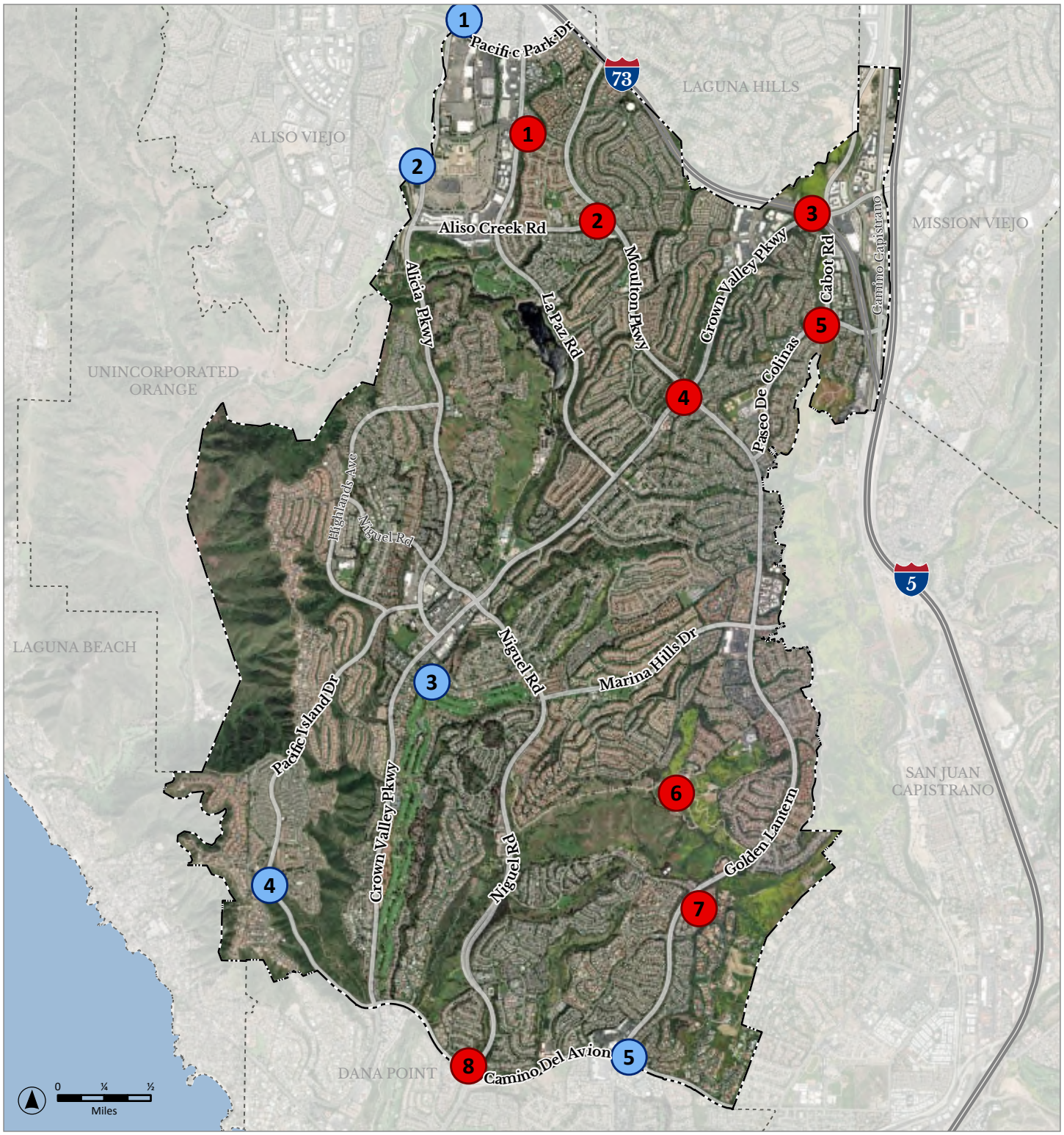
- Laguna Niguel City Boundary
- Other Jurisdictions

Inundation Areas

- El Toro Reservoir
- Lake Mission Viejo
- Sulphur Creek
- Upper Oso

Figure 4-4.

Dam Inundation Areas



Data sources: MD Acoustics; City of Laguna Niguel; Orange County GIS.

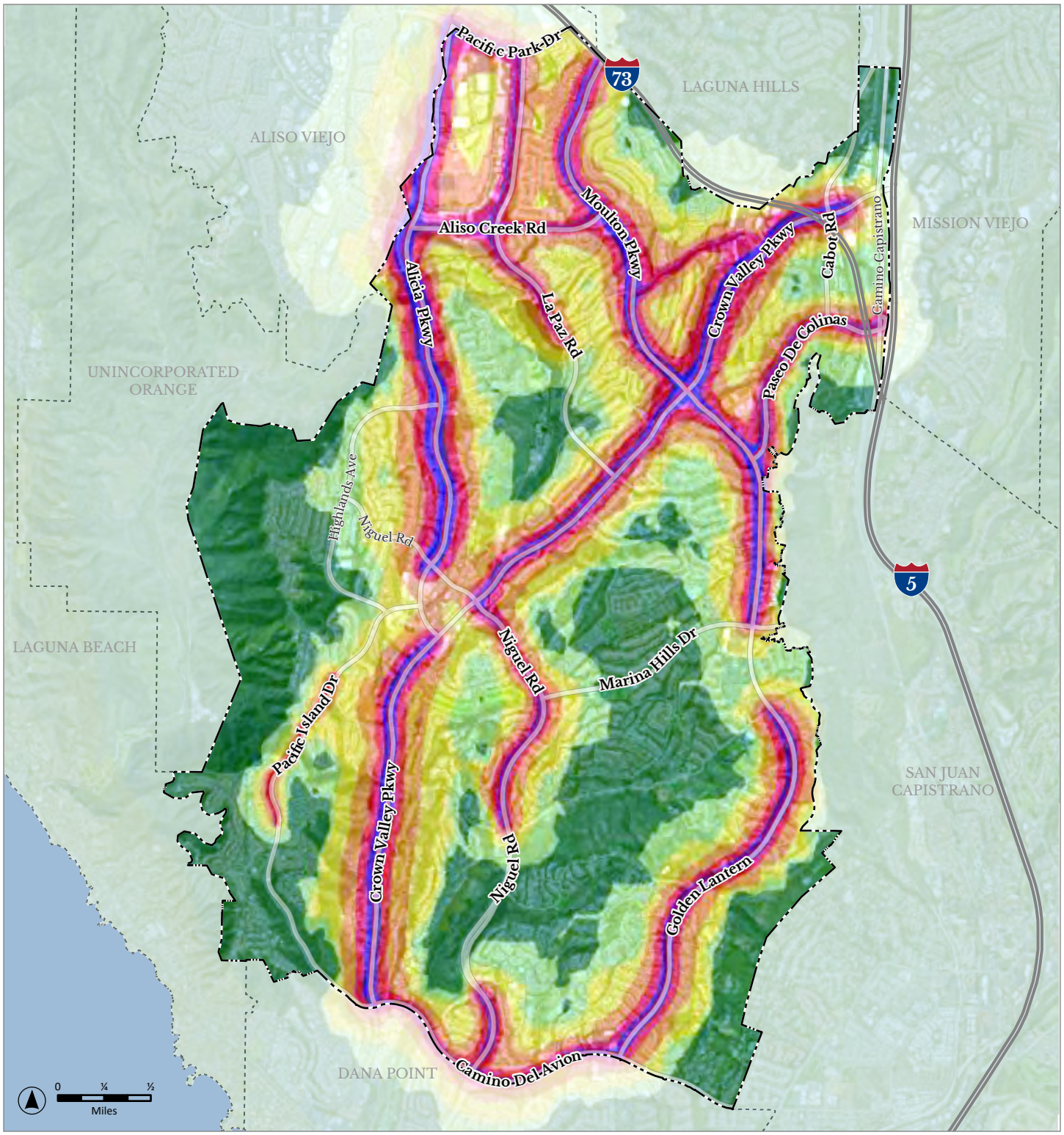
Prepared for the City of Laguna Niguel by De Novo Planning Group
May 21, 2025

LEGEND

- Laguna Niguel City Boundary
- Other Jurisdictions
- Long-Term Measurment Location
- Short-Term Measurment Location

Figure 4-5.

Noise Measurement Locations



Data sources: MD Acoustics; City of Laguna Niguel; Orange County GIS.

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May 21, 2025

LEGEND

- Laguna Niguel City Boundary
- Other Jurisdictions

Levels in dB(A)

<45	50–55	60–65
45–50	55–60	>=65

Figure 4-6.

Existing Roadway Noise Level Contours (CNEL)