12 Noise

Chapter 12-evaluates potential noise impacts from Program implementation on human receptors. Impacts of Program noise on fish and wildlife are addressed in Chapter 4, *Biological Resources – Aquatic*, and Chapter 5, *Biological Resources – Terrestrial*. Results of the evaluations are provided at a programmatic level. Section 12.1, Environmental Setting, presents an overview of the physical properties and environmental noise; and contains federal, state, and local ordinances, plans, and regulations that are applicable to the Program. Section 12.2, Environmental Impacts and Mitigation Measures, presents the following:

> Environmental concerns and evaluation criteria used to determine whether the Program alternatives would cause significant impacts on noise levels throughout the region

> Evaluation methods and assumptions

> Discussion of noise impacts of the Program alternatives

> Cumulative impacts summary

> A summary of environmental impacts due to noise

Table 2-5 in Section 2.6 presents the District's list of equipment that could generate noise. Handheld equipment is not included in this table. Appendix D, *Noise Analysis Technical Report*, includes additional detailed information regarding the physical properties of noise; federal, state, and local noise regulations; and equipment use noise generated by each of the Program alternatives.

12.1 Environmental Setting

12.1.1 Overview of Environmental Sound

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. Several noise measurement scales are used to describe noise in a particular location. A decibel (dB) is a unit of measurement that indicates the relative Amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 dB represents a 10-fold increase in acoustic energy, while 20 dB is 100 times more intense, 30 dB is 1,000 times more intense, etc. A relationship exists between the subjective noisiness or loudness of a sound and its intensity. Each 10-dB increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities.

Several methods are used to characterize sound. The most common is the A-weighted sound level, or dBA. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be used. Most commonly, sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

Because the sensitivity to noise increases during the evening and at night—excessive noise interferes with the ability to sleep—24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The Community Noise Equivalent Level (CNEL) is a measure of the cumulative noise exposure in a community, with a 5-dB penalty added to evening (7:00 PM to 10:00 PM) and a 10-dB addition to nocturnal (10:00 PM to 7:00 AM) noise levels. The day/night average sound level (L_{dn}) is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this 3-hour period are grouped into the daytime period.

Noise changes both in level and frequency spectrums as it travels from the source to the receiver. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise is reduced depends on a variety of factors, including the noise source type as well as the region over which the noise source propagates. Noise generated by a point source, such as equipment at a construction site, drops off at a rate of 6 dBA per doubling of distance. Traffic noise attenuates, or is reduced, at a different rate. The movement of vehicles makes the noise source appear to emanate from a line as opposed to a single point when viewed over a period of time. Noise levels drop-off at a rate of about 3 dBA per doubling of distance for this type of source near hard surfaces, such as paved areas or bodies of water. However, ground type also plays into how much of a drop off over distance will occur. Surfaces, such as plowed fields, crops, or grass, absorb some of the sound energy as the sound passes over; therefore, noise is reduced by 4.5 dBA for every doubling of the distance in such areas.

12.1.2 Community Noise Levels

Community noise levels depend on the intensity of nearby human activity. Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45- to 60-dBA range, and high above 60 dBA. In rural and undeveloped areas, L_{dn} can fall below 35 dBA. Levels above 75 to 80 dBA are more common near major freeways and airports. Although people often accept the higher levels associated with very noisy urban areas, they nevertheless are considered to be adverse to public health. The human pain threshold for sound is 120 dBA.

Typical noise levels from both mobile and stationary sources are included in Table 12-1.

Table 12-1 Typical Stationary and Mobile Noise Source Sound Levels in dBA

Noise Source	Sound Level in dBA
Sprayer, handheld	**10-20**
Noise at ear level from rustling leaves	20
Room in a quiet dwelling at midnight	32
Soft whisper at 5 feet	34
Large department store	50 to 65
Room with window air conditioner	55
Leaf blower/vac	**55-105**
Conversational speech	60 to 75
Pump station equipment with noise abatement	62
Sprayer, powered, truck- or trailer-mounted	**65-105**
Passenger car at 50 feet	69
Vacuum cleaner in private home at 10 feet	69
Tractor, agricultural	**76-110**
Ringing alarm at 2 feet	80
Brush/weed cutter	**90-97**
Roof-top air conditioner	85
Small bulldozer (Cat D3) or excavator (Cat 320)	**74-80**
Heavy bulldozer at 50 feet	87
All-terrain vehicle (ATV)	87-109

Table 12-1 Typical Stationary and Mobile Noise Source Sound Levels in dBA

Noise Source	Sound Level in dBA
Heavy city traffic	90
Lawn mower	**91-98**
Chainsaw	**100-120**
Jet aircraft at 500 feet overhead	115
Construction blast	120 to 145 at 50 feet

Sources: Equipment manufacturer specification sheets, Noise Control Reference Handbook, Industrial Acoustics Company

Note:

Bold indicates equipment used in the Program. Sound levels are measured at 50 feet from the source unless otherwise noted.

12.1.3 Noise Level Acceptance Criteria

The surrounding land uses dictate what noise levels would be considered acceptable or unacceptable. In rural and undeveloped areas away from roads and other human activity, the day-to-night difference is normally small. Because of diurnal activity, nighttime ambient levels in urban environments are about 7 dB lower than the corresponding daytime levels. Nighttime noise is a concern because of the likelihood of disrupting sleep. Noise levels above 45 dBA at night can result in the onset of sleep interference. At 70 dBA, sleep interference effects become considerable (USEPA 1974).

12.1.4 Sensitive Receptors

Some land uses are generally regarded as being more sensitive to noise than others due to the types of population groups or activities involved. The definition of sensitive receptors varies by jurisdiction, but in general sensitive population groups include children and the elderly and sensitive land uses include residential (single- and multifamily, mobile homes, dormitories, and similar uses), guest lodging, parks and outdoor recreation areas, hospitals, nursing homes and other long-term medical care facilities, and educational facilities, including schools, libraries, churches, and places of public assembly.

12.1.5 Regulatory Setting

Federal and state guidelines and local ordinances pertaining to environmental noise within the District's Service Area are cited in this section.

12.1.5.1 Federal Regulations

The federal noise standards or guidelines discussed in this section are relevant to the implementation of Program alternatives. Noise regulations and standards are provided for the following agencies:

> USEPA

> Federal Aviation Administration (FAA)

12.1.5.1.1 US Environmental Protection Agency

The USEPA has developed guidelines on recommended maximum long-term noise levels to protect public health and welfare (USEPA 1974). The USEPA does not enforce these guidelines, but rather offers them as a planning tool for state and local agencies. Table 12-2 provides examples of protective noise levels recommended by the USEPA. They are applicable to noise generated on federal lands, such as national wildlife refuges.

Table 12-2 USEPA-Designated Long-Term Noise Safety Levels

Effects	Noise Level	Area
Hearing Loss	$L_{eq}(24) < 70$ dB	All areas
Outdoor Activity Interference and Annoyance	$L_{dn} < 55$ dB	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.
	L_{eq} (24) <55 dB	Outdoor areas where people spend limited amounts of time, such as schoolyards, playgrounds, etc.
Indoor Activity Interference and Annoyance	$L_{dn} < 45$ dB	Indoor residential areas
	$L_{eq}(24) < 45$ dB	Other indoor areas with human activities such as schools, etc.

Source: USEPA 1974

Notes:

L_{eq} (24) = sound energy averaged over a 24-hour period.

L_{dn} = L_{eq} with a 10-dB nighttime weighting.

12.1.5.1.2 Federal Aviation Administration

The major parts of CFR Title 14: Aeronautics and Space, Chapter I: Federal Aviation Administration, Department of Transportation, Subchapter C, for fixed-wing aircraft noise and Subchapter H for helicopter noise, were reviewed for applicability to Program flight operations, specifically:

Part 91: Flight Operations

Portions of Part 91 are provided to describe operational restrictions associated with different aircraft types. Altitude limitations governing agricultural operations are given in Part 137, Agricultural Operations. They are included because the FAA considers aerial spraying to be an agricultural use, even if it is not specifically used for agricultural purposes.

Fixed-wing aircraft not operating under Instrument Flight Rules, emergencies, during takeoff or landing, or Part 137 are required to maintain the altitudes listed in Section 91.119 - Minimum Safe Altitudes: General (a)-(d). Section 91.119 (a), (b), and (c) are provided below.

Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

a. Anywhere. An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.

b. Over Congested Areas. Over any congested area of a city, town, or settlement, or over any open-air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.

c. Over Other than Congested Areas. An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.

Section 137.49 – Operations over other than Congested Areas

Notwithstanding Part 91 of this chapter, during the actual dispensing operation, including approaches, departures, and turnarounds reasonably necessary for the operation, an aircraft may be operated over other than congested areas below 500 feet above the surface and closer than 500 feet to persons,

vessels, vehicles, and structures, if the operations are conducted without creating a hazard to persons or property on the surface.

Section 137.51 – Operation over Congested Areas: General

(a) Notwithstanding Part 91 of this chapter, an aircraft may be operated over a congested area at altitudes required for the proper accomplishment of the agricultural aircraft operation if the operation is conducted:

(1) With the maximum safety to persons and property on the surface, consistent with the operation, and

(2) In accordance with the requirements of paragraph (i) of this section

(i) No person may operate an aircraft over a congested area except in accordance with the requirements of this paragraph.

(3) Prior written approval must be obtained from the appropriate official or governing body of the political subdivision over which the operations are conducted.

(4) Notice of the intended operation must be given to the public by some effective means, such as daily newspapers, radio, television, or door-to-door notice.

(5) A plan for each complete operation must be submitted to, and approved by appropriate personnel of the FAA Flight Standards District Office having jurisdiction over the area where the operation is to be conducted. The plan must include consideration of obstructions to flight, the emergency landing capabilities of the aircraft to be used, and any necessary coordination with air traffic control.

(6) Single engine aircraft must be operated as follows:

(i) Except for helicopters, no person may take off a loaded aircraft, or make a turnaround over a congested area.

(ii) No person may operate an aircraft over a congested area below the altitudes prescribed in Part 91 of this chapter except during the actual dispensing operation, including the approaches and departures necessary for that operation.

(iii) No person may operate an aircraft over a congested area during the actual dispensing operation, including the approaches and departures for that operation, unless it is operated in a pattern and at such an altitude that the aircraft can land, in an emergency, without endangering persons or property on the surface.

(7) Multiengine aircraft must be operated as follows:

(i) No person may take off a multiengine airplane over a congested area except under conditions that will allow the airplane to be brought to a safe stop within the effective length of the runway from any point on takeoff up to the time of attaining, with all engines operating at normal takeoff power, 105 percent of the minimum control speed with the critical engine inoperative in the takeoff configuration or 115 percent of the power-off stall speed in the takeoff configuration, whichever is greater, as shown by the accelerate stop distance data. In applying this requirement, takeoff data is based upon still-air conditions, and no correction is made for any uphill gradient of 1 percent or less when the percentage is measured as the difference between elevations at the end points of the runway divided by the total length. For uphill gradients greater than 1 percent, the effective takeoff length of the runway is reduced 20 percent for each 1 percent grade.

(ii) No person may operate a multiengine airplane at a weight greater than the weight that, with the critical engine inoperative, would permit a rate of climb of at least 50 feet per minute at an altitude of at least 1,000 feet above the elevation of the highest ground or obstruction within the area to be worked or at an altitude of 5,000 feet, whichever is higher. For the purposes of this subdivision, it is assumed that the propeller of the inoperative engine is in the minimum drag position, that the wing flaps and landing gear are in the most favorable positions, and that the remaining engine or engines are operating at the maximum continuous power available.

(iii) No person may operate any multiengine aircraft over a congested area below the altitudes prescribed in Part 91 of this chapter except during the actual dispensing operation, including the approaches, departures, and turnarounds necessary for that operation.

Section 137.53 – Operation over Congested Areas: Pilots and Aircraft

(a) General. No person may operate an aircraft over a congested area except in accordance with the pilot and aircraft rules of this section.

(b) Pilots. Each pilot in command must have at least:

(1) 25 hours of pilot-in-command flight time in the make and basic model of the aircraft, at least 10 hours of which must have been acquired within the preceding 12-calendar months.

(2) 100 hours of flight experience as pilot in command in dispensing agricultural materials or chemicals.

(c) Aircraft

(1) Each aircraft must:

(i) If it is an aircraft not specified in paragraph (c)(1)(ii) of this section, have had within the preceding 100 hours of time in service a 100-hour or annual inspection by a person authorized by Part 65 or 145 of this chapter, or have been inspected under a progressive inspection system.

(ii) If it is a large or turbine-powered multiengine civil airplane of U.S. registry, have been inspected in accordance with the applicable inspection program requirements of Section 91.409 of this chapter.

(2) If other than a helicopter, it must be equipped with a device capable of jettisoning at least one-half of the aircraft's maximum authorized load of agricultural material within 45 seconds. If the aircraft is equipped with a device for releasing the tank or hopper as a unit, there must be a means to prevent inadvertent release by the pilot or other crewmember.

12.1.5.2 State Regulations

California Government Code Section 65302(f) encourages each local government entity to conduct noise studies and implement a noise element as part of its General Plans. In addition, the California Office of Planning and Research published guidelines for evaluating the compatibility of various land uses as a function of community exposure to permanent or long-term noise sources, and they are listed in Table 12-3. In general, noise levels less than 60-dBA L_{dn} are acceptable for all land uses, including residences, schools, and other noise-sensitive receptors. These guidelines are contained in the Marin Countywide Plan, Built Environment Element, Noise, Figure 3-41 (Marin County 2007).

Table 12-3 Land Use Compatibility for Community Noise Environment

Land Use Category	Community Noise Exposure – L_{dn} or CNEL in dBA						
	50	55	60	65	70	75	80
Residential – Low-Density Single Family, Duplex, Mobile Home							
Residential – Multifamily							
Transient Lodging – Motel, Hotel							
Schools, Libraries, Churches, Hospitals, Nursing Homes							
Auditorium, Concert Hall, Amphitheaters							
Sports Arena, Outdoor Spectator Sports							
Playgrounds, Neighborhood Parks							
Golf Courses, Riding Stables, Water Recreation, Cemeteries							
Office Buildings, Business Commercial and Professional							
Industrial, Manufacturing, Utilities, Agriculture							

Legend

	Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design.
	Normally Unacceptable: New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.
	Clearly Unacceptable: New construction or development generally should not be undertaken.

Source: State of California, Office of Planning and Research, 1998 General Plan Guidelines

CNEL = Community Noise Equivalent Level

dBA = A-weighted decibel(s)

L_{dn} = Day-Night Noise Level

12.1.5.3 Local Regulations

A listing of local county plans and city and county noise ordinances for Marin and Sonoma counties and the cities located within these counties, and relevant provisions are summarized in Table 12-4. Cities and counties in California are required to include a noise element in their general plans, which include policies intended to achieve noise compatibility between land uses. These policies typically establish average noise levels that are acceptable at different land uses and are usually the same as or similar to those recommended by the state. The standards established in the noise elements for the Service Area are intended to establish land-use compatibility for planning purposes and are not intended to address temporary and sporadic sources of noise such as would be generated by the Proposed Program (IVMP) addressed in this PEIR. Noise elements are, therefore, not discussed further.

Most jurisdictions within the Service Area specify allowable hours for construction and specify allowable noise levels resulting from construction during certain times of day. Although the District's IVMP does not include construction per se, some alternatives use construction-type equipment, such as trucks and tractors, and like construction, would cause temporary impacts. Therefore, construction noise standards are used as a method to describe allowable temporary noise. Some jurisdictions have exemptions for certain types of emergency work, but the IVMP generally does not fall under their definitions of emergency work.

12.2 Environmental Impacts and Mitigation Measures

The noise impacts evaluation is provided below. The evaluation qualitatively and quantitatively compares probable noise levels against the impact significance criteria presented in Section 12.2.1.

12.2.1 Evaluation Concerns and Criteria

Temporary noise increases within the Program Area would be associated with the use of vehicles, backpack sprayers and ancillary equipment, sprayers, boats, heavy equipment, and aerial applications similar to current use of this equipment.

For this evaluation, impacts from Program noise sources would be considered significant if noise levels would:

> Expose people to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. Because of the large number of local jurisdictions involved, the state's long-term land use compatibility guidelines, shown in Table 12-3, are used as a surrogate for land use compatibility standards in local general plans.

> Result in a substantial temporary increase in ambient noise levels above levels existing without the Program.

The CEQA Guidelines, and most cities and counties, do not provide a definition of what constitutes a substantial noise increase for the second bullet point above. A common practice has been to assume that minimally perceptible to clearly noticeable increases of 3 to 5 dBA represent a significant increase in ambient noise levels. A sliding scale is commonly used to identify the significance of noise increases, allowing greater increases at lower absolute sound levels than at higher sound levels. This approach is based on research that relates changes in noise to the percentage of individuals that would be highly annoyed by the change (Federal Interagency Committee on Noise 1992). The significance criteria for changes in noise from Program operations would be a 3-dBA CNEL increase in noise levels if the existing noise level already exceeds the acceptable range for the land use, or a 5-dBA CNEL increase in noise if the existing noise level is in the acceptable range and the resulting level remains within the acceptable range for the land use.

Table 12-4 Marin and Sonoma County Summary of Local Noise Standards

Jurisdiction	Source	Standards	Applicability to Project	URL
Marin County	Marin Countywide Plan 2007, Built Environment Element, Noise	**Goal NO-1 Protection from Excessive Noise**. Ensure that new land uses, transportation activities, and construction do not create noise levels that impair human health or quality of life.	Not applicable because the focus of the policy is on new development, not existing uses and activities.	http://www.co.marin.ca.us/depts/cd/main/fm/cwpdocs/CWP_CD2.pdf
Marin County	Municipal Code 6.70.030	Establishes hours for construction activities and other work undertaken in connection with building, plumbing, electrical, and other permits issued by the community development agency:	Not applicable because no permits are required from the community development agency.	https://www.municode.com/library/ca/marin_county/codes/code_of_ordinances?nodeId=TIT6PUPESAMO_CH6.70LOUNNO
Belvedere	Municipal Code 8.10	**8.10.010 Purpose**. It is hereby declared to be the policy of the City of Belvedere, in the exercise of its police power, to protect the peace, health, safety, and general welfare of the citizens of Belvedere from excessive, unnecessary and unreasonable noises. The provisions of this Chapter and the remedies contained in this Code shall be cumulative and are not intended to replace any otherwise available remedies for public or private nuisances, nor any other civil or criminal remedies otherwise available. In addition, the regulations contained herein are not intended to substitute for any noise analysis conducted as a part of the City's environmental review process for discretionary permit approvals, nor is it intended to limit more strict noise control requirements for discretionary permit approvals should more strict measures be found to be necessary in order to maintain noise levels that are not detrimental to the health and welfare of the citizens of the City. (Ord. 2006-3 § 3 (part), 2006.) **8.10.020 Prohibition against excessive noise**. It is unlawful for any person to willfully make or continue, or cause to be made or continued, any loud, unnecessary or unusual noise which disturbs the peace or quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitivity residing in the area, and it is unlawful for any person in ownership or control of any premises to knowingly permit a violation of this section upon said premises. (Ord. 2006-3 § 3 (part), 2006.) **8.10.040 Prohibited noise generation**. Loud, unnecessary or unusual noises prohibited by Section 8.10.020 shall include, but not be limited to, the following: B. Power and construction tools. Using, operating or permitting to be used or operated, any power tool or construction tool in such manner as to unreasonably disturb the peace, quiet and comfort of a reasonable person of normal sensitivity residing in the area. Notwithstanding the foregoing, the use of power or construction tools in connection with a valid building permit issued by the City shall be subject to the terms and conditions and laws applicable to that permit. **8.10.050 Prima facie violations during quiet time.** The conduct of any loud, unnecessary or unusual noises prohibited by section 8.10.020 between the hours of 9 PM and 7 AM Sunday through Thursday and 11 PM to 7 AM Friday and Saturday in such a manner as to be plainly audible at a distance of fifty (50) yards from the structure, vehicle, or premises in which it is located shall be prima facie evidence of a violation of this Chapter. (Ord. 2006-3 § 3 (part), 2006.)	Provides "quiet time" hours whereby noise sources audible at 50 yards are prohibited.	http://www.cityofbelvedere.org/DocumentCenter/Home/View/368
Corte Madera	Code of Ordinances, Title 9 – Peace, Safety and Morals, Chapter 9.36.	(c) The provisions of subsection (a) shall not apply to construction or demolition work performed during the following times: Monday through Fridays from seven AM to five PM; and Saturdays and Sundays from ten AM to five PM; provided, that all powered construction equipment is equipped with intake and exhaust mufflers recommended by the manufacturers thereof; and provided, further, pavement breakers and jackhammers shall also be equipped with acoustical attenuating shields or shrouds recommended by the manufacturers thereof. In lieu of or in the absence of manufacturer's recommendations, the town engineer shall have the authority to prescribe such means of accomplishing maximum noise attenuation as he deems to be in the public interest, considering the available technology and economic feasibility.	Provides exemption for construction work between times listed. Requires certain noise mitigating equipment to be installed construction equipment.	https://library.municode.com/index.aspx?clientId=16293
Fairfax	Municipal Code 8.20.070	**§ 8.20.070 EXEMPTIONS.** D. Operating or permitting the operation of any mechanically powered tools or equipment for construction, demolition or property maintenance work between 8:00 AM and 6:00 PM Monday through Friday, and 9:00 AM to 4:00 PM on weekends and holidays are exempt. E. Anyone operating mechanically powered tools during permitted hours shall use best practices to minimize flying dust and debris and to protect neighbors, pedestrians and others nearby from disturbed particulate matter. **§ 8.20.060 PROHIBITED ACTS.** 2. Operating or permitted the operation of any mechanically powered tools between the hours of 6:00 PM and 8:00 AM Monday through Friday and between 4:00 PM and 9:00 AM on weekends and holidays is prohibited.	The proposed operations are exempt between the hours of 8 AM and 6 PM on weekdays and between 9 AM and 4 PM on weekends and holidays. Work outside of these times is prohibited.	http://www.amlegal.com/nxt/gateway.dll/California/fairfax_ca/townoffairfaxcaliforniamunicipalcodeofor?f=templates$fn=default.htm$3.0$vid=amlegal:fairfax_ca

Table 12-4 Marin and Sonoma County Summary of Local Noise Standards

Jurisdiction	Source	Standards	Applicability to Project	URL
Larkspur	Municipal Code Chapter 9.54.040, Noise Control Regulations	**9.54.060 Exemptions.** The following activities shall be exempted from the provisions of this chapter: D. Any mechanical device, apparatus or equipment related to or connected with emergency activities or emergency work. E. Noise sources associated with construction, repair, remodeling, demolition, or paving of any real property, provided said activities shall only occur during the following time periods: 1. Monday through Friday (excluding legal holidays) 7 AM to 6 PM Saturday, Sunday, and legal holidays 9 AM to 5 PM This exception is granted provided that all powered construction equipment is equipped with intake and exhaust mufflers recommended by the manufacturers thereof; pavement breakers and jackhammers shall also be equipped with acoustical attenuating shields or shrouds recommended by the manufacturers thereof. 2. In lieu of or in the absence of manufacturers' recommendations, the Director of Public Works shall have the authority to prescribe such means of accomplishing maximum noise attenuation as the director deems to be in the public interest, considering the available technology and economic feasibility. 3. The Director of Public Works may allow the following exception to the provisions of subsection (1) above: when an unforeseen or unavoidable condition occurs during a construction project and the nature of the project necessitates that work in progress be continued until a specific phase is completed, the contractor or owner may, with the consent of the Director of Public Works, be allowed to continue work after 6 PM and to operate machinery and equipment necessary to conclude the specific work in progress under conditions that will not jeopardize inspection acceptance or create undue financial hardships for the contractor or owner.	Ordinance provides work times, requirements for gasoline engine exhaust pipes and allows for exceptions by the Director of Public Works and/or by permit.	http://www.codepublishing.com/ca/Larkspur/html/Larkspur09/Larkspur0954.html
Mill Valley	Municipal Code, Title 7 Health and Sanitation, Chapter 7.16 Noise Control	**Construction Projects.** The noise levels produced by construction projects shall not exceed 60 dBA plus the adjustments of subsection B of Section 7.16.060 without issuance of a special permit. The special permit shall not be issued by the authorized City department unless the applicant demonstrates that the equipment to be used produces noise levels that are the lowest of currently available equipment. Exception: No permit is required to perform emergency work. Contractors shall be required to prominently display a notice of the date of commencement of construction noise at least three days prior to actual commencement. Such notice shall be located on the construction site and shall be readable from the closest adjacent street. **7.16.080 Exemptions** The following activities shall be exempted from the provisions of this chapter: C. Noise sources associated with or vibration created by construction, repair, remodeling, or grading of any real property or during authorized seismic surveys, provided such activities do not take place between the hours of 6:00 PM and 7:00 AM on weekdays, or at any time on Saturday, Sunday or a legal holiday, and provided the noise level created by such activities does not exceed the noise standard of 60 dBA plus the adjustments specified in subsection B of Section 7.16.060, as measured on residential property, and any vibration created does not endanger the public health, welfare and safety. Heavy equipment and power tools are restricted to weekdays between the hours of 8:00 AM and 5:00 PM Owner/occupant builders are exempt from the time and heavy equipment and power tools restrictions on Saturdays between the hours of 9:00 AM and 5:00 PM Construction noise sources exceeding the above limits shall be allowed only upon issuance of a special permit under subsection D of Section 7.16.090. Nothing in this chapter shall be construed to prohibit construction activities that do not exceed the Ambient noise level by more than 10 dBA, such as painting or interior work.	Requires special permits for non-emergency work. Construction type work is exempt between the hours listed in 7.16.080.	http://www.qcode.us/codes/millvalley/

Table 12-4 Marin and Sonoma County Summary of Local Noise Standards

<table>
<tr><th>Jurisdiction</th><th>Source</th><th>Standards</th><th>Applicability to Project</th><th>URL</th></tr>
<tr><td>Novato</td><td>Municipal Code 19.22.070</td><td>
Noise and Construction Hours
A. Applicability. Uses, activities, and processes shall not generate or emit any noise or sound in excess of the levels provided in Table 3-5 beyond the property line of the parcel on which they are located, except as provided in Subsection B.
B. Exceptions. The following are exempt from the allowable noise level requirements of Table 3-5 as noted:
2. Emergency vehicle responses and all necessary equipment utilized in responses to a declared state of emergency;
4. Authorized construction activities, including warming-up or servicing of equipment, and any preparation for construction between 7 AM and 6 PM on weekdays, and between 10 AM and 5 PM on Saturdays. No construction is allowed on Sundays or official federal national holidays, except as otherwise authorized herein by the Community Development Director.
5. Authorized grading activities and equipment operations between 7 AM to 6 PM weekdays only, when City inspectors are available.
6. Routine maintenance activities.
7. Other construction activities as authorized in writing by the Community Development Director.
C Noise Measurement. Exterior noise levels shall be measured at the property line of the noise source. Noise measurement shall be made with a sound level meter using the "A" weighted scale at slow meter response. Fast meter response shall be used only for an impulsive noise.

Table 3-5: Allowable Exterior Noise Levels
<table>
<tr><th rowspan="2">Type of Land Use</th><th colspan="2">Allowable Exterior Levels(1)</th></tr>
<tr><th>Time Interval</th><th>Maximum Noise Level(2)</th></tr>
<tr><td rowspan="2">Residential(3)</td><td>10 PM to 6 AM</td><td>45 dBA</td></tr>
<tr><td>6 AM to 10 PM</td><td>60 dBA</td></tr>
<tr><td rowspan="2">Commercial(4)</td><td>10 PM to 6 AM</td><td>60 dBA</td></tr>
<tr><td>6 AM to 10 PM</td><td>70 dBA</td></tr>
<tr><td>Industrial or manufacturing(4)</td><td>Any time</td><td>70 dBA</td></tr>
</table>
Notes:
(1) Each of the noise limits specified in Table 3-5 shall be reduced by 5 dBA for impulse or simple tone noises. If the Ambient noise exceeds the resulting standard, the Ambient shall be the standard.
(2) Maximum noise levels shall not be exceeded for an aggregate period of more than three minutes within a one-hour time period or by more than 20 dBA at any time.
(3) Residential standards apply to sensitive receptors such as schools, hospitals, libraries, group care facilities, and convalescent homes. These uses may require special mitigation.
(4) Commercial standards apply to Mixed Use Districts.
D. Authorized construction activity and uses established through the discretionary land use permit process may be subject to specific noise conditions of approval and/or mitigation measures that are more restrictive.
</td><td>Provides authorized construction activity hours and prohibitions as well as discretionary land use permits.</td><td>https://library.municode.com/index.aspx?clientId=16532</td></tr>
</table>

Table 12-4 Marin and Sonoma County Summary of Local Noise Standards

Jurisdiction	Source	Standards	Applicability to Project	URL
Ross	Municipal Code Chapter 9.20	The director of public works may, on a finding of good cause, grant written exceptions to these time limitations. Such permission must be obtained prior to the commencement of any work outside the prescribed hours. **9.20.035**. Construction. (a) It is unlawful for any person or construction company within the town limits to perform any construction operation before eight AM or after five PM, Monday through Friday of each week and not at any time on Saturday, Sunday, or the other holidays listed in Section 9.20.060 **9.20.070.** Exhaust pipe required for gasoline, etc., motor. No person having charge or control of any engine in which gas, gasoline, distillate or other similar substance is used as motive power, shall run or operate the engine, or cause it to be run or operated, without having the exhaust pipe thereof connected with an underground air chamber or having attached to the exhaust pipe a muffler or other device so constructed as to deaden the sound of the exhaust from making any loud noise or disturbing the peace and quiet of persons in its vicinity; provided, that this section shall not apply to motor vehicles, except when used in a stationary position for the purpose of supplying power other than for their own movement. (Ord. 267 §4(part), 1967: prior code §4352). **9.20.090.** Permit required when no other procedure is applicable. Unless other procedures are specifically provided in the particular sections of this chapter, a permit may be issued authorizing noises prohibited by this chapter whenever it is found the public interest will be served thereby. Applications for permits shall be in writing and shall be accompanied by an application fee in the amount of five dollars and shall set forth in detail the facts showing that the public interest will be served by the issuance of the permit. Applications shall be made to the building inspector; provided, however, with respect to work upon or involving the use of a public street, alley, building or other public place under the jurisdiction of the department of public works. No permits shall be issued unless the application is first approved by the department of public works, the chief of police and the town clerk. Anyone dissatisfied with the denial of a permit may appeal to the council. (Ord. 267 §4(part), 1967: prior code §4354).	Ordinance provides work times, requirements for gasoline engine exhaust pipes and allows for exceptions by the Director of Public Works and/or by permit.	http://www.townofross.org/pdf/resource_center/municipal_code/muni-code-complete-set.pdf
San Anselmo	Code of Ordinances, Title 4 – Public Welfare, Morals, and Conduct, Chapter 7	**Construction and demolition.** (a) Except as otherwise provided in subsections (b), (c), and (d) of this section, for a period of two (2) years after March 13, 1975, it shall be unlawful to operate any powered equipment if the operation of such equipment emits a noise level of eighty-five (85) dBA when measured at the loudest point fifty (50′) feet away from the equipment. On and after March 13, 1977, the permissible noise level shall be reduced to eighty (80) dBA. (b) Impact tools and equipment shall be excluded from the provisions of subsection (a) of this section; provided, however, on or after September 13, 1975, such impact tools and equipment shall have intake and exhaust mufflers recommended by the manufacturers thereof; and provided, further, pavement breakers and jackhammers shall also be equipped with acoustically attenuating shields or shrouds recommended by the manufacturers thereof. In lieu of or in the absence of manufacturers' recommendations, the Director of Public Works shall have the authority to prescribe such means of accomplishing maximum noise attenuation as he deems to be in the public interest, considering the available technology and economic feasibility. (c) Construction or demolition work may be performed during the following times: Mondays through Fridays from 7:00 AM to 7:00 PM; Saturdays from 9:00 AM to 5:00 PM; and Sundays from 12:00 PM to 5:00 PM; provided, however, such hours shall be extended until 8:00 PM for work performed by homeowners or residents upon their own property. Construction or demolition work shall be allowed at any time provided the noise level does not exceed five (5) dBA above the Ambient at the nearest property plane with allowance for correction factors as set forth in subsection (b) of Section 4-7.104 of Article I of this chapter. (d) The provisions of this section shall not apply to emergency work as defined in subsection (e) of Section 4-7.102 of Article 1 of this chapter. As defined in the above section, "emergency work" shall mean work made necessary to restore property to a safe condition following a public calamity or work required to protect persons or property from an imminent exposure to danger or work by private or public utilities when restoring utility service.	Provides authorized construction hours and noise level limits. Emergency work is exempt.	https://www.municode.com/library/ca/san_anselmo/codes/code_of_ordinances?nodeId=TIT4PUWEMOCO_CH7LONO_ART1GEPR

Table 12-4 Marin and Sonoma County Summary of Local Noise Standards

Jurisdiction	Source	Standards	Applicability to Project	URL
San Rafael	Code of Ordinances, Title 8, Chapter 8.13	**8.13.070 Exemptions.** The following shall be exempt from the provisions of this chapter: B. Emergency vehicle responses and all necessary equipment utilized for the purpose of responding to an emergency, or necessary to restore, preserve, protect or save lives or property from imminent danger of loss or harm; D. The operation of any municipal or public utility vehicles; F. Uses established through any applicable discretionary review process containing specific noise conditions of approval and/or mitigation measures; G. Work on capital improvements, or repairs on public property by employees or contractors of the city; H. Vehicle noise subject to regulation under the California Vehicle Code; I. Emergency repair work performed by, or at the request of, a property owner on his or her private property, where the delay required to obtain an exception permit under this chapter would result in substantial damage, personal injuries, or property loss to the owner, provided that such emergency work shall be subject to such reasonable conditions as may be imposed by authorized city employees to mitigate the noise level of the activity.	The proposed operations fall under one or more of the exemptions listed under 8.13.070.	https://www.municode.com/library/ca/san_rafael/codes/code_of_ordinances?nodeId=TIT8MOCO
Sausalito	Municipal code 12.16.040	**12.16.130 Machinery, equipment, fans and air conditioning** It is unlawful for any person to operate any machinery, equipment, pump, fan, air conditioning apparatus, or similar mechanical device in any manner so as to create any noise which would cause the noise level at the property line of any property to exceed the Ambient base noise level by more than five decibels. [Ord. 783 Art. II § 5, 1972.] **12.16.140 Time restrictions on operating construction devices in residential zones.** A. The operation of construction, demolition, excavation, alteration or repair devices and equipment shall only take place during the following hours: 1. Weekdays: Between 8:00 AM and 6:00 PM 2. Saturdays: Between 9:00 AM and 5:00 PM 3. Sundays: Prohibited. 4. Holidays officially recognized by the City of Sausalito not including Sundays: Between 9:00 AM and 7:00 PM	Provides noise level requirements relative to Ambient noise levels. Provides authorized construction activity hours and prohibitions.	http://www.codepublishing.com/ca/sausalito/
Tiburon	Title IV – Land Improvement and Use, Chapter 13 – Building Regulations. Article III. – Development Standards	**1313-6 Hours of Construction.** (a) Generally, all work covered by a permit issued under this chapter shall be performed only between the hours of seven AM to five PM, Monday through Friday, and nine thirty AM to four PM on Saturday. Only quiet work is allowed to be performed on Saturdays, such that noise from any source associated with the permitted work, including but not limited to construction activity, Amplified sound, and worker's voices, shall not be plainly audible beyond the property line. (b) Work covered by a permit shall not be performed on Sunday or on holidays observed by the Town of Tiburon. These holidays are New Year's Day, Martin Luther King Day, President's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. (c) For work covered by a permit, the arrival or departure of heavy equipment (including but not limited to concrete trucks, graders and backhoes) and/or the delivery of heavy items or materials (including but not limited to lumber, concrete, debris boxes, and portable restrooms) to a work site shall occur only on Monday through Friday between the hours of seven AM to five PM Hours of operation, maintenance, and servicing of heavy equipment shall be limited to eight AM to 5:00 PM, Monday through Friday. Heavy equipment may begin engine warm up, but not actual operation, at 7:30 AM (d) Exceptions. The limitations in sections 13-6(a) through (c) shall not apply in the following instances: (1) When prior to the commencement of any work covered by a permit issued under this chapter, the town manager grants written permission to perform work outside of the prescribed hours; (2) When work is necessary in an emergency situation to remedy or prevent damage to persons or property.	Provides authorized construction activity hours and prohibitions. Exceptions granted for emergencies.	https://library.municode.com/index.aspx?clientId=16657

Table 12-4 Marin and Sonoma County Summary of Local Noise Standards

<table>
<tr><th>Jurisdiction</th><th>Source</th><th>Standards</th><th>Applicability to Project</th><th>URL</th></tr>
<tr><td>Sonoma County</td><td>Sonoma County General Plan 2020, Noise Element</td><td>Policy NE-1c: Control non-transportation related noise from new projects. The total noise level resulting from new sources shall not exceed the standards in Table NE-2 as measured at the exterior property line of any adjacent noise sensitive land use. Limit exceptions to the following:
(1) If the Ambient noise level exceeds the standard in Table NE-2, adjust the standard to equal the Ambient level, up to a maximum of 5 dBA above the standard, provided that no measurable increase (i.e. +/- 1.5 dBA) shall be allowed.
(2) Reduce the applicable standards in Table NE-2 by 5 dBA for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises, such as pile drivers and dog barking at kennels.
(3) Reduce the applicable standards in Table NE-2 by 5 decibels if the proposed use exceeds the Ambient level by 10 or more decibels.
(4) For short-term noise sources which are permitted to operate no more than 6 days per year, such as concerts or race events, the allowable noise exposures shown in Table NE-2 may be increased by 5 dB. These events shall be subject to a noise management plan including provisions for maximum noise level limits, noise monitoring, complaint response and allowable hours of operation. The plan shall address potential cumulative noise impacts from all events in the area.
(5) Noise levels may be measured at the location of the outdoor activity area of the noise sensitive land use, instead of the exterior property line of the adjacent noise sensitive land use where:
(a) the property on which the noise sensitive use is located has already been substantially developed pursuant to its existing zoning, and
(b) there is available open land on those noise sensitive lands for noise attenuation.
This exception may not be used on vacant properties which are zoned to allow noise sensitive uses.
Table NE- 2 Maximum Allowable Exterior Noise Exposures for Non-transportation Noise Sources***
<table>
<tr><th>Hourly Noise Metric[1]
dBA</th><th>Daytime
(7 AM to 10 PM)</th><th>Nighttime
(10 PM to 7 AM)</th></tr>
<tr><td>L50 (30 minutes in any hour</td><td>50</td><td>45</td></tr>
<tr><td>L25 (15 minutes in any hour)</td><td>55</td><td>50</td></tr>
<tr><td>L08 (4 minutes 48 seconds in any hour)</td><td>60</td><td>55</td></tr>
<tr><td>L02 (72 seconds in any hour)</td><td>65</td><td>60</td></tr>
</table>
[1] The sound level exceeded n% of the time in any hour. For example, the L50 is the value exceeded 50% of the time or 30 minutes in any hour; this is the median noise level. The L02 is the sound level exceeded 1 minute in any hour.</td><td>The project includes short-term, non-transportation noise.</td><td>http://www.sonoma-county.org/prmd/gp2020/noise.pdf</td></tr>
<tr><td>City of Cloverdale</td><td>No applicable noise ordinance</td><td>NA</td><td>NA</td><td>http://www.cloverdale.net/DocumentCenter/Home/View/537</td></tr>
<tr><td>City of Cotati</td><td>Municipal Code 17.30.050</td><td>Table 3-5: Allowable Hours of Construction
<table>
<tr><th>Day</th><th>Allowable Hours</th></tr>
<tr><td>Monday through Friday</td><td>7:00 AM to 7:00 PM</td></tr>
<tr><td>Saturday and Sunday, Holidays</td><td>Construction activities may only be allowed by the review authority through conditions of approval between 9:00 AM and 5:00 PM</td></tr>
</table>
4. Limitation on Truck Deliveries. Truck deliveries to a commercial or industrial parcel adjacent to a residential zoning district shall be limited to the hours between seven AM and seven PM, unless the director authorizes other delivery times based on the determination that there is either no feasible alternative, or there are overriding transportation and traffic management benefits to scheduling deliveries at night.</td><td>Provides allowable hours of operation for construction-related activities.</td><td>http://www.codepublishing.com/CA/Cotati/</td></tr>
</table>

Table 12-4 Marin and Sonoma County Summary of Local Noise Standards

Jurisdiction	Source	Standards	Applicability to Project	URL
City of Healdsburg	Municipal Code 9.32.010	**Construction and Temporary Activities** A. Noise sources associated with or vibration created by construction, repair, remodeling, or grading of any real property or during authorized seismic surveys are permitted, provided such activities do not take place between the nighttime hours of 6:00 PM and 7:30 AM daily, or at any time on Sunday or a legal holiday, and provided the noise level created by such activities and any vibration created does not endanger the public health, welfare, and safety. C. Nothing in this section shall be construed to prohibit construction activities that do not exceed the Ambient noise level by more than 10 dBA, such as painting or interior work. (Ord. 1011 § 7, 2003.) **9.32.080 Standards for maximum sound levels and determining violations.** A. Sound Level Standards. It is the objective of the City to require intruding noise levels not to exceed those listed below to determine if a violation exists:	Provides allowable hours of operation. If Ambient noise levels are not exceeded by more than 10 dB(A), no prohibition exists.	http://www.codepublishing.com/CA/healdsburg/#!/Healdsburg09/Healdsburg0932.html
City of Petaluma	Municipal Code 21.020	Establishes prohibitions from construction work without permit though emergency **21.040.3 a**. The following specific acts, subject to the exemptions provided in Section 21.040(A)(5), are declared to be public nuisances and are prohibited: 1) The operation or use of any of the following before 7:00 AM or after 10:00 PM daily (except Saturday, Sunday and State, Federal or Local Holidays, when the prohibited time shall be before 9:00 AM and after 10:00 PM): 2) A hammer or any other device or implement used to repeatedly pound or strike an object. 3) An impact wrench, or other tool or equipment powered by compressed air. 4) Any tool or piece of equipment powered by an internal-combustion engine such as, but not limited to, chain saw, backpack blower, and lawn mower. Except as specifically included in this Ordinance, motor vehicles, powered by an internal combustion engine and subject to the State of California vehicle code, are excluded from this prohibition. 5) Any electrically or battery powered tool or piece of equipment used for cutting, drilling, or shaping wood, plastic, metal, or other materials or objects, such as but not limited to a saw, drill, lathe or router. 6) Any of the following: the operation and/or loading or unloading of heavy equipment (such as but not limited to bulldozer, road grader, back hoe), ground drilling and boring equipment, hydraulic crane and boom equipment, portable power generator or pump, pavement equipment (such as but not limited to pneumatic hammer, pavement breaker, tamper, compacting equipment), pile-driving equipment, vibrating roller, sand blaster, gunite machine, trencher, concrete truck, and hot kettle pump and the like. 7) Construction, demolition, excavation, erection, alteration or repair activity. **21.040.3 b**. In the case of urgent necessity and in the interest of public health and safety, the Noise Control Officer may issue a permit for exemption from the requirements with subsection 21.040(A)(3). Such period shall not exceed ten (10) working days in length but may be renewed for successive periods of thirty (30) days or less, not to exceed a total of 90 days while the emergency continues. Requests for exemptions beyond 90 days shall require public hearing approval. The Noise Control Officer may limit such permit as to time of use and/or permitted action, depending upon the nature of the emergency and the type of action requested. 6. Exceptions. a. Authorities. The Noise Control Officer is authorized to grant exceptions from any provision of this chapter, subject to limitations of proximity to noise sensitive uses, noise levels, time limits and other terms and conditions as the Noise Control Officer determines are appropriate to protect the public health, safety and welfare from the noise emanating therefrom. This section shall in no way affect the duty to obtain any permit or license required by law for such activities.	Provides allowable hours of operation and allows the Noise Control Officer to issue permits or grant exceptions.	http://cityofpetaluma.net/cdd/pdf/izo/chapter21-performance-standards.pdf
City of Rohnert Park	Title 9 – Public Peace, Morals and Welfare, Chapter 9.44 - Noise	Chapter 9.44 identifies Ambient base noise levels, noise standards for various sources, specific noise restrictions, exemptions, and variances for sources of noise within the city. The Noise Ordinance applies to all noise sources with the exception of any vehicle that is operated upon any public highway, street or right-of-way, or to the operation of any off-highway vehicle, to the extent that it is regulated in the State Vehicle Code, and all other sources of noise that are specifically exempted. The Noise Ordinance limits construction activity within a residential zone or a radius of 500 feet there from to the hours of 8:00 AM – 6:00 PM when the potential noise levels would cause discomfort or annoyance to a reasonable person of normal sensitiveness residing in the area. No permits are required to perform emergency work, which is defined as work made necessary to restore property to a safe condition following a public calamity or work required to protect persons or property from an imminent exposure to danger or work by private or public utilities when restoring utility service.	Acceptable hours of operation for construction activities are provided. Emergency work does not require a permit.	https://www.municode.com/library/#!/ca/rohnert_park/codes/code_of_ordinances?nodeId=TIT9PUPEMOWE_ARTIVOFAGPUPE_CH9.44NO

Table 12-4 Marin and Sonoma County Summary of Local Noise Standards

Jurisdiction	Source	Standards	Applicability to Project	URL
City of Santa Rosa	No applicable noise ordinance.	NA	NA	http://ci.sant-rosa.ca.us/departments/cityadmin/cityclerk/Pages/CityCode.aspx
City of Sebastopol	Municipal Code Title 8 Health and Safety, Chapter 8.25 Noise Ordinance	**8.25.060 NOISE LEVELS** 1. It shall be unlawful for any person to emit or cause to be emitted any noise beyond the boundaries of his/her premises in excess of the noise levels established in these regulations. 2. Noise level standards: A. No person in a residential zone shall emit noise beyond the boundaries of his/her premises exceeding the levels stated herein and applicable to adjacent residential, commercial and industrial zones. Noise Levels shall not exceed: Daytime Hours — 55 dBA Nighttime Hours — 45 dBA B. No person in a commercial zone shall emit noise beyond the boundary of his/her premises exceeding the levels state herein and applicable to adjacent residential, commercial or industrial zones: Noise Levels shall not exceed: Daytime Hours — 55 dBA Nighttime Hours — 45 dBA C. No person in an industrial zone shall emit noise beyond the boundary of his/her premises exceeding the levels stated herein and applicable to adjacent residential commercial or industrial zones: Noise Levels shall not exceed: Daytime Hours — 65 dBA Nighttime Hours — 55 dBA D. High background noise levels and impulse noise. In those individual cases where the background noise levels caused by sources not subject to these regulations exceed the standards contained herein, a source shall be considered to cause excessive noise if the noise emitted by such source exceeds the background noise levels by five (5) dBA, provided that no source subject to the provisions of this chapter shall emit noise in excess of eighty (80) dBA at any time and provided that this section does not decrease the permissible levels of other sections of this chapter. No person shall cause or allow the emission of impulse noise in excess of eighty (80) dB peak sound pressure level during the nighttime to any residential noise zone. No person shall cause or allow the emission of impulse noise in excess of one hundred (100) dB peak sound pressure level at any time to any zone. **F. Exemptions:** The following shall be exempt from these regulations subject to special conditions as spelled out: (1) Noise generated by any construction equipment which is operated during daytime hours, defined for the purposes of this section as from 7:00 AM to 8:00 PM, Monday through Friday, 8:00 AM to 5:00 PM on Saturdays and from 8:00 AM to 5:00 PM on Sundays. (2) Noise created as a result of or relating to an emergency. (3) Noise from demolition work conducted during daytime hours. When considered emergency work, demolition shall be exempted at all times from the noise levels set in this regulation. (6) Noise created by blasting other than that conducted in connection with construction activities shall be exempted, provided that the blasting is conducted between 8:00 AM and 5:00 PM local time at specified hours previously announced to the local public and provided that a permit for such blasting is obtained from the appropriate federal, state or local authorities. (9) Noise created by pick-up or delivery vehicles in commercial or industrial zones during daytime hours. "Daytime hours, defined for the purposes of this section as from 7:00 AM to 8:00 PM, Monday through Friday, 8:00 AM to 5:00 PM on Saturdays and from 8:00 AM to 5:00 PM on Sundays.	Provides allowable hours for construction activities.	http://ci.sebastopol.ca.us/sites/default/files/mgourley/updated_december_2014_municipal_code_2013_entire_code.pages_.pdf

Table 12-4 Marin and Sonoma County Summary of Local Noise Standards

Jurisdiction	Source	Standards	Applicability to Project	URL
City of Sonoma	Sonoma Municipal Code, Title 9 Public Peace, Safety and Morals, Chapter 9.56 Noise	**9.56.050 Standard Exceptions to General Noise Limits**. The following standard exceptions to the provisions of SMC 9.56.040 shall be allowed as of right, to the extent and during the hours specified. A summary of the standard exceptions provided in this section is set forth in Table 2. A. Construction. Except as otherwise provided in subsection (B) of this section, or by the planning commission or city council as part of the development review for the project, on any construction project on property within the city, construction, alteration, demolition, maintenance of construction equipment, deliveries of materials or equipment, or repair activities otherwise allowed under applicable law shall be allowed as follows: (1) between 8:00 AM and 6:00 PM, Monday through Friday, (2) between 9:00 AM and 6:00 PM on Saturday, and (3) between 10:00 AM and 6:00 PM on Sundays and holidays; however, the noise level at any point outside of the property plane of the project shall not exceed 90 dBA.	Provides acceptable hours of operation for construction, alteration, demolition, maintenance of construction equipment, deliveries of material or equipment and/or repair activities.	http://codepublishing.com/ca/sonoma/frameless/index.pl?path=../html/Sonoma09/Sonoma0956.html#9.56.050
Town of Windsor	No applicable noise ordinance.	NA	NA	http://www.ci.windsor.ca.us/DocumentCenter/Home/View/3193

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Other CEQA Guidelines Appendix G criteria for noise impacts include impacts from permanent increases in noise levels, ground-borne vibration, and impacts from nearby airports and airstrips. With regard to vibration, Program equipment with the highest vibratory potential would include light trucks. While these vehicles may produce vibration, the levels would not be expected to be perceptible over existing vibration from delivery or highway truck traffic, and vibration levels would not reach thresholds for human annoyance or structural damage. With regard to permanent increases in noise levels, noise from the Program would be temporary and would last only for the duration of each activity. No potential exists to produce permanent increases in noise as a result of the Program. Finally, with regard to airports and airstrips, the Program would not result in the location of any new receptors near airports or airstrips. Therefore, these three criteria have been dismissed from the analysis and are not discussed further.

Concerns raised during scoping include:

> Noise-related impacts on humans, in particular consistency with local noise regulations

> Noise-related impacts on wildlife

The potential to exceed noise standards and result in substantial temporary noise levels above those existing (and without the Program equipment in use) within the Program Area are evaluated for each Program alternative. Impacts of Program noise on wildlife are addressed in Chapter 5, *Biological Resources-Terrestrial*.

12.2.2 Evaluation Methods and Assumptions

The methodology and assumptions of this noise impact evaluation for Program alternatives are provided below.

12.2.2.1 Methodology

The methodology used to prepare this programmatic noise impact section is as follows:

> Reviewed transcripts from public scoping meetings on the PEIR held in June 2012.

> Reviewed federal, state, and county and municipal noise regulations, plans, ordinances, and/or guidelines for general noise issues and issues related to Program-specific noise sources.

> Obtained source-specific noise data for Program-specific noise sources where available.

> Estimated noise levels for specific and categorical equipment types proposed for Program operations where specific noise data were not available at 50 feet and 400 feet from point of measure.

> Compared Proposed Program activities with those that currently occur under the existing vector control program (existing conditions).

> Determined probable noise impacts associated with the alternatives proposed in Chapter 2 based on the above significance thresholds. The impact analysis is based on detailed information regarding equipment and vehicle types and usage, and land uses where they would be used provided by each of the Districts. Detailed information regarding the noise generated by each type of equipment and vehicles that would be used is shown in Appendix D, Table 4-4.

12.2.2.2 Assumptions

The following assumptions were used in the assessment of potential noise impacts from the Program alternatives:

> Impacts are addressed at a programmatic level based on categories of land use types. Site-specific evaluation of noise sources and potential impacts is beyond the scope of this programmatic evaluation.

Also, the District has committed to implementation of BMPs to avoid and minimize impacts from their Program activities. The analysis of impacts considered the implementation of the following BMPs (from

Section 2.9, Table 2-6) that the District uses for operations that generate noise expected to be of concern to the public:

> Vehicles driving on levees to travel through tidal marsh or to access sloughs or channels for surveillance or treatment activities will travel at speeds no greater than 10 miles per hour to minimize noise and dust disturbance. (BMP A8)

> Operation of noise-generating equipment (e.g., chainsaws, wood chippers, brush-cutters, pickup trucks) will abide by the time-of-day restrictions established by the applicable local jurisdiction (i.e., City and/or County) if such noise activities would be audible to receptors (e.g., residential land uses, schools, hospitals, places of worship) located in the applicable local jurisdiction. Shut down all motorized equipment when not in use. (BMP A11)

> For operations that generate noise expected to be of concern to the public, the following measures will be implemented:

  - Measure 1: Provide Advance Notices. A variety of measures are implemented depending on the nature/magnitude of the activities, including press releases, social media, District websites, hand-delivered flyers, posted signs, emails, and/or phone alerts. Public agencies and elected officials also may be notified of the nature and duration of the activities, including the local Board of Supervisors or City Council, environmental health and agricultural agencies, emergency service providers, and airports. (BMP A12)

  - Measure 2: Provide Mechanism to Address Complaints. The District staff is available during regular business hours to respond to service calls and address concerns about nighttime operations. (BMP A12)

> Engine idling times will be minimized either by shutting equipment and vehicles off when not in use or reducing the maximum idling time to 5 minutes. Correct tire inflation will be maintained in accordance with manufacturer‘s specifications on wheeled equipment and vehicles to prevent excessive rolling resistance. All equipment and vehicles will be maintained and properly tuned in accordance with manufacturer‘s specifications. All equipment will be checked by a certified visible emissions evaluator if visible emissions are apparent to onsite staff. (BMP A14)

> The District will provide notification to the public (24 to 48 hours in advance if possible) and/or appropriate agency(ies) when applying pesticides or herbicides for large-scale treatments (e.g., fixed wing aircraft or helicopters) that will occur in close proximity to homes, heavily populated, high traffic, and sensitive areas. The District infrequently applies or participates in the application of herbicides in areas other than District facilities. (BMP H13)

12.2.3 Surveillance Alternative

The Surveillance Alternative would involve both ground surveillance and water surveillance. As shown in Table 12-5, ground surveillance would require the periodic use of light trucks, such as pickup trucks and jeeps, and ATVs and would take place in all land use types. Water surveillance would require the use of ATVs and, occasionally, boats and most frequently would occur in agricultural and open-space areas including wildlife refuges, where noise-sensitive human receptors are typically not located. Table 12-5 also shows the range of noise levels that vehicles and equipment typically would generate at 50- and 400-foot distances from the source. As indicated, noise attenuates, or is reduced, rapidly as the distance from the noise source increases. Detailed information regarding the average number of hours per day and the number of days in a quarter that equipment and vehicles would be used is included in Appendix D. Most equipment would only be operated a few hours per day for varying periods of time throughout the year.

Table 12-5 Surveillance Alternative – Primary Equipment Use, Noise Levels, and Land Use Types

Activity	Application Equipment	Predicted Noise Level (dBA)		Land Use Types				
		50 feet	400 feet	Residential	Commercial	Industrial	Agricultural	Open Space
Ground Surveillance & Application/Mgt	Light trucks	83	65	●	●	●	●	●
	ATVs	87	69				●	●
Water Surveillance & Applications/Mgt	Airboat, other boats	75-95	57-77				●	●

12.2.3.1 Exceedance of Noise Standards

The District BMPs include requiring operation of noise-generating equipment to abide by the time-of-day restrictions established by the applicable local jurisdiction if such noise activities would be audible to receptors located in the applicable local jurisdiction; thus, this alternative would be consistent with the time-of-day standards established by each of the local jurisdictions.

Most jurisdictions identify noise limits allowed during certain times of day as a result of construction activities. As noted above, the BMPs include requiring operation of noise-generating equipment to abide by the time-of-day restrictions established by the applicable local jurisdiction if such noise activities would be audible to receptors located in the applicable local jurisdiction. Noise from this alternative would be periodic, limited to brief periods of time spread out over multiple days in multiple locations, minimizing the amount of time any sensitive receptor was exposed to increased noise. The only land-based equipment operated near residential and commercial development would be light trucks, which are commonly used in such areas and would not increase noise levels beyond the established thresholds given that only a few trucks would be used and they would be in proximity to such uses only for a brief period of time.

ATVs primarily would be used in agricultural and open-space areas, as well as industrial areas, which are typically not considered to be noise-sensitive receptors. No thresholds for agricultural and open-space land uses have been established by local jurisdictions, and the guidelines USEPA and State of California established are intended to protect human receptors in such areas from long-term sources of noise, not temporary, sporadic sources such as would occur under the Program. Boats would be used in open-space areas. Airboats would be used primarily in areas such as marshes and seasonal wetlands. Given the temporary, sporadic increase in noise at any given location, noise from the Surveillance Alternative would not exceed regulatory standards.

> **Impact N-1:** Use of equipment and vehicles under the Surveillance Alternative would increase noise levels during operations, but this increase would not exceed noise standards. This impact is **less than significant** based on the frequency and duration of the activity, resulting noise levels, and compliance with BMPs. No mitigation is required.

12.2.3.2 Substantial Temporary Increase in Noise Levels

Noise from the use of light trucks generally would not be distinguishable from ambient noise levels because it takes a doubling of traffic to increase noise levels by only 3 dB. The types of light trucks that would be used (e.g., pickup trucks and jeeps) are common, and a limited number of vehicles would be used and would be dispersed over a large area. Use of ATVs and boats would occur in agricultural and

open-space areas; they generally would not be used in proximity to noise-sensitive receptors, although certain types of open-space areas may have increased sensitivity to noise, such as those used by recreational users seeking quiet, and some boats could be used within approximately 100 yards of residential areas. Given the limited numbers of vehicles and boats that would be used sporadically for brief periods of time over a large area and the limited duration that they would be used in any given location, noise levels would not increase by 3- to 5-dBA CNEL in proximity to noise-sensitive receptors. The District also is already implementing the types of activities that are part of this alternative; thus, this alternative represents a continuation of existing conditions, and noise levels from Program activities would not increase beyond those that already occur. In addition, BMP A8 requires reduced vehicle speed on levees, reducing noise levels in these areas. Furthermore, BMP 14 requires that all equipment and vehicles will be maintained and properly tuned in accordance with the manufacturer's specifications, not only improving air quality but reducing noise as well. In addition, BMPs A11 and A12-will be implemented as appropriate by providing advance notification of noise-generating activities expected to be of concern to the public and providing a means for registering public complaints about noise, thus further minimizing the potential for public annoyance.

> **Impact N-2:** Use of equipment and vehicles under the Surveillance Alternative would cause a temporary increase in noise levels during operations. This increase would not be substantial and, therefore, is **less than significant** based on the frequency and duration of the activity, resulting noise levels, comparability to noise resulting from existing activities, and implementation of BMPs. No mitigation is required.

12.2.4 Physical Control Alternative

The Physical Control Alternative involves a variety of actions, some of which would not directly result in noise; they include educating and advising landowners regarding appropriate methods to manage vectors such as rats and mosquitoes. Other activities would require the implementation of maintenance activities within marshes and wetlands, which typically are in undeveloped areas and not in proximity to noise-sensitive receptors. Other activities would take place in more urban areas, such as those including localized vegetation/water circulation management associated with wastewater treatment facilities.

As shown in Table 12-6, ground management would require the periodic use of light trucks, such as pickup trucks and jeeps, and ATVs, as well as equipment such as mowers, excavators, weed-eaters, and chainsaws. Hedge trimmers are relatively quiet so not included in the table (i.e., not an issue). Water management would require the use of ATVs and, occasionally, boats. Table 12-6 also shows the range of noise levels that they typically would generate at 50- and 400-foot distances from the source. This table also shows the land use types where activities typically would occur.

Table 12-6 Physical Control Alternative–Primary Equipment Use, Noise Levels, and Land Use Types

Activity	Application Equipment	Predicted Noise Level (dBA)		Land Use Types				
		50 feet	400 feet	Residential	Commercial	Industrial	Agricultural	Open Space
Ground Surveillance & Application/Mgt	Light trucks	**83**	**65**	●	●	●	●	●
	Mowers	80	58	●	●	●		
	Excavators	87	69	●	●	●	●	●
	Weed-eater, chainsaw	67-72	49-54	●	●	●	●	●
Water Surveillance & Applications/Mgt	Airboat, other boats	75-95	57-77				●	●
	ATVs	87	69				●	●

12.2.4.1 Exceedance of Noise Standards

The discussion under the Surveillance Alternative related to the use of light trucks, boats/airboats, and ATVs is applicable to the Physical Control Alternative because similar types of vehicles and equipment would be used, and they would generate similar amounts of noise and be used for a similar length of time. This alternative also would require the periodic use of other equipment, which would generate noise that was less than or equal noise from trucks, airboats, and ATVs. Noise generated by the Physical Control Alternative would not exceed noise standards due to the sporadic, temporary nature of the impact.

> **Impact N-3:** Use of equipment and vehicles under the Physical Control Alternative would increase noise levels during operations, but this increase would not exceed regulatory thresholds. This impact is **less than significant** based on the frequency and duration of the activity and resulting noise levels. No mitigation is required.

12.2.4.2 Substantial Temporary Increase in Noise Levels

The discussion under the Surveillance Alternative related to the use of light trucks and ATVs is applicable to the Physical Control Alternative because similar types of vehicles and equipment would be used, and they would generate similar amounts of noise and be used for a similar length of time. The District is already implementing the types of activities that would occur under this alternative and noise impacts, therefore, would be comparable to those that already occur. In addition, BMPs will be implemented as appropriate by providing advance notification of noise-generating activities expected to be of concern to the public based on the District's knowledge of the area it serves and any complaints or concerns received. The District has received few complaints about noise from control activities. BMP 12 provides a means for registering public complaints about noise, thus further minimizing the potential for public annoyance.

> **Impact N-4:** Use of equipment and vehicles under the Physical Control Alternative would cause a temporary increase in noise levels during operations. This increase would not be substantial, and therefore is **less than significant** based on the frequency and duration of the activity, resulting noise levels, comparability to noise resulting from existing activities, and implementation of BMPs. No mitigation is required.

12.2.5 Vegetation Management Alternative

Certain elements of the Vegetation Management Alternative would not directly generate noise, such as providing suggestions to landowners on how to perform vegetation management on their property. At other times, District staff periodically would undertake vegetation management activities, which require the use of hand tools or other mechanical means (i.e., heavy equipment) for vegetation removal, thinning, or trimming and sometimes may apply herbicides (chemical pesticides with specific toxicity to plants) to improve surveillance or reduce vector habitats. Vegetation removal, thinning, or trimming primarily occurs in aquatic habitats to assist with access, surveillance, and the control of mosquitoes and in terrestrial habitats to help with the control of other vectors. To reduce the potential for mosquito breeding associated with water retention and infiltration structures, District staff may systematically clear weeds and other obstructing vegetation in wetlands and retention basins. Alternatively, the District may request the structures' owners to perform this task. In this case, it will be the responsibility of the landowner to determine and comply with all legal requirements necessary to perform the activity. District policy is that with every recommendation, the District also makes it clear to the landowner the requirement for consultation with resource agencies and acquisition of permits that may be needed prior to commencement of any work. Tools ranging from shovels and pruners to chainsaws and weed-eaters up to heavy equipment can all be used at times to clear plant matter that either prevents access to mosquito breeding sites or that fosters good water management practices that would minimize mosquito populations. Generally, however, District "brushing" activities rely almost entirely on hand tools.

As shown in Table 12-7, vegetation management would require the periodic use of light trucks, such as pickup trucks and jeeps, and ATVs, as well as equipment such as tractors, mowers, chainsaws, weed-eaters, and sprayers. Water management would require the use of ATVs and, occasionally, boats. In addition to the vehicles and equipment that the District would use, Table 12-7 shows the range of noise levels that they typically would generate at 50- and 400-foot distances from the source and the land uses that typically would be affected. Shovels and other hand tools that generate no noise or minimal noise are not included in this table.

Table 12-7 Vegetation Management Alternative – Primary Equipment Use, Noise Levels, and Land Use Types

Activity	Application Equipment	Predicted Noise Level (dBA)		Land Use Types				
		50 feet	400 feet	Residential	Commercial	Industrial	Agricultural	Open Space
Ground Surveillance & Application/Mgt	Light trucks	83	65	●	●	●	●	●
	ATVs	87	69				●	●
	Tractor, mower	76	58				●	●
	Weed-eater, chainsaw	67-72	49-54	●	●	●	●	●
	Sprayer	65	47	●	●	●	●	●
Water Surveillance & Applications/ Management	Airboat, other boats	75-95	57-77				●	●

12.2.5.1 Exceedance of Noise Standards

The discussion under the Surveillance Alternative related to the use of light trucks and ATVs and airboats and other boats is applicable to the Vegetation Management Alternative because similar types of vehicles would be used, and they would have comparable noise levels and also would be used for brief periods of time over multiple locations. The Vegetation Management Alternative also would require the use of equipment such as tractors, mowers, weed-eaters, chainsaws, and sprayers, but such equipment would primarily be used in agricultural and open-space areas, which are not considered noise-sensitive receptors. Noise generated would be similar to that which already occurs and would not exceed noise standards.

> **Impact N-5:** Use of equipment and vehicles under the Vegetation Management Alternative would increase noise levels during operations, but this increase would not exceed regulatory thresholds. This impact is **less than significant** based on the frequency and duration of the activity and resulting noise levels. No mitigation is required.

12.2.5.2 Substantial Temporary Increase in Noise Levels

The discussion under the Surveillance Alternative related to the use of light trucks and ATVs, airboats, and other boats is applicable to the Vegetation Management Alternative because similar types of vehicles would be used, they would have comparable noise, levels, and they also would be used for brief periods of time over multiple locations. Noise generated would be similar to that which already occurs and would not result in a substantial temporary increase in noise levels. The Vegetation Management Alternative also would require the use of equipment such as tractors, mower, weed-eaters, chainsaws, and sprayers, but such equipment would primarily be used in agricultural and open-space areas, which are not considered noise-sensitive receptors. In addition, BMPs will be implemented as appropriate by providing advance notification of noise-generating activities expected to be of concern to the public (e.g., recreationists potentially present in open-space areas) and providing a means for registering public complaints about noise, thus further minimizing the potential for public annoyance.

> **Impact N-6:** Use of equipment and vehicles under the Vegetation Management Alternative would cause a temporary increase in noise levels during operations. This increase would not be substantial, and therefore is **less than significant** based on the frequency and duration of the activity, resulting noise levels, comparability to noise resulting from existing activities, and implementation of BMPs. No mitigation is required.

12.2.6 Biological Control Alternative

The Biological Control Alternative involves the use of mosquito pathogens, parasites, and predators (i.e., mosquitofish). The parasites are not commercially available at present. The other options would generate noise, from the periodic use of light trucks (for distribution of mosquitofish at artificial waterbodies only), and occasionally, ATVs, boats, tractors, and sprayers for the pathogens which are discussed under the Chemical Control Alternative. Examples of bacteria pathogenic to mosquitoes are Bs, the several strains of Bti, and *Saacharopolyspora spinosa* (or spinosad). The focus in this section is on the use of mosquitofish.

The number and type of vehicles and equipment required, as shown in Table 12-8, which also shows the range of noise levels that they typically would generate at 50- and 400-foot distances from the source and the land uses that would be affected.

Table 12-8 Biological Control – Primary Equipment Use, Noise Levels, and Land Use Types

Activity	Application Equipment	Predicted Noise Level (dBA)[a]			Land Use Types				
		50 feet	400 feet	500 feet	Residential	Commercial	Industrial	Agricultural	Open Space
Ground Surveillance & Application/Mgt	Light trucks	83	65	—	•	•	•	•	•

12.2.6.1 Exceedance of Noise Standards

The discussion under the Surveillance Alternative related to the use of light trucks is applicable to the Biological Control Alternative because similar types of vehicles would be used, with similar noise levels, and they also would be used for brief periods of time over multiple locations. Trucks would be used for limited periods of time at any given location, within the hours allowed by the local jurisdictions, as required by the BMPs and, thus, would not exceed noise standards.

> **Impact N-7:** Use of vehicles under the Biological Control Alternative would increase noise levels during operations, but this increase would not exceed regulatory thresholds. This impact is **less than significant** based on the frequency and duration of the activity and resulting noise levels. No mitigation is required.

12.2.6.2 Substantial Temporary Increase in Noise Levels

The discussion under the Surveillance Alternative related to the use of light trucks is applicable to the Biological Control Alternative because similar types of vehicles would be used, they would have similar noise levels, and they also would be used for brief periods of time over multiple locations.

> **Impact N-8:** Use of vehicles under the Biological Control Alternative would cause a temporary increase in noise levels during operations. This increase would not be substantial and, therefore, is **less than significant** based on the frequency and duration of the activity and resulting noise levels, and implementation of BMPs. No mitigation is required.

12.2.7 Chemical Control Alternative

A variety of activities would be implemented under the Chemical Control Alternative. Some activities for mosquito larviciding and adulticiding would require extensive use of vehicles and equipment. Noise associated with applications of biological pathogens as larvicides is discussed here.

The District would use a variety of techniques and equipment to apply mosquito larvicides, including handheld sprayers, backpack sprayers and blowers, truck- or ATV-mounted spray rigs, and helicopters or other aircraft. The Districts use conventional pickup trucks, ATVs, and boats as larvicide vehicles. Equipment used in ground applications of liquid formulations include handheld sprayers (handcans or spray bottles), and backpack sprayers and blowers. Handheld sprayers (handcans) are standard 1- or 2- or 3-gallon garden style pump-up sprayers used to treat very small isolated areas. Backpack sprayers are either hand pump-up for liquid applications and have a 2.5/3 to 5-gallon tank or are gas powered. When large areas are simultaneously producing mosquito larvae at densities exceeding District treatment thresholds, then the District may use helicopters or other aircraft to apply larvicides. Aerial application by helicopter of larvicides is a relatively infrequent activity for the District, and makes up only a small portion of the District's larvicide applications each year, with each application covering from approximately 20 to

600 acres, the smaller acreage sites are typically problematic and contain dense and abundant vegetation). Aerial application of liquid larvicides typically occurs during daylight hours and at an altitude above the treatment site of approximately 50 feet or less. Granular applications would occur during daylight hours at a 50-foot altitude or less.

The most common form of adulticide application is via the use of Ultra Low Volume (ULV) methods and equipment mounted on trucks, ATVs, golf carts, and watercraft or handheld for ground applications, applying the materials at very low dosage rates.

Aerial applications of mosquito larvicides and adulticides using helicopters and, potentially, fixed-wing aircraft in the future are used to obtain effective control in expansive areas or areas in which access is especially difficult and/or impediments to applying larvicides (and adulticides) from the ground exist, such as a dense canopy cover of invasive vegetation. The flight parameters differ by program and technique. Some operators apply adulticides by flying during hours of daylight, so their applications begin either at morning's first light or before sunset and work into twilight. The aircraft can be flown at a less than 200-foot altitude, which may make it easier to hit the target area. Other operations may be conducted in the dark of the night, typically after twilight or early in the morning before dawn. The aircraft typically are flown between 200- and 300-foot altitudes. Swath widths vary from operation to operation but are normally set somewhere between 400 and -1,200 feet. Aerial applications of larvicides (but also adulticides if a very large area requires treatment) may be conducted over, but are not limited to, the following land uses within the Program Area: salt marsh, diked marsh, seasonal wetlands; evaporation ponds and wastewater ponds; and agricultural, residential, commercial, industrial, and recreational areas. Urban or suburban areas would only be treated with adulticides in the event of a severe risk of disease transmission.

The type of vehicles and equipment required, as shown in Table 12-9, which also shows the range of noise levels that they typically would generate at 50- and 400-foot distances from the source and the land uses that would be affected. Noise from helicopters also is shown at a 500-foot distance. All land use types potentially could be treated through aerial applications.

Table 12-9 Chemical Control Alternative – Primary Equipment Use, Noise Levels, and Land Use Types

Activity	Application Equipment	Predicted Noise Level (dBA)[a]			Land Use Types				
		50 feet	400 feet	500 feet	Residential	Commercial	Industrial	Agricultural	Open Space
Ground Surveillance & Application/Mgt	Light trucks, water truck	75-88	57-70	—	●	●	●	●	●
	ATVs	87	69					●	●
	Foggers	50-75	32-57		●	●	●	●	●
	Sprayers	65-75	47-57		●	●	●	●	●
Water Surveillance & Applications/Mgt	Airboat, other boats	75-95	57-77	—				●	●
	Sprayers	65	47					●	●
Aerial Applications	Helicopter, fixed-wing aircraft			84-89	●	●	●	●	●

Notes:

[a] Noise from aircraft used for agricultural operations, such as those expected to be used for aerial applications, is not regulated by the FAA and, therefore, no noise information is available. Noise likely would be comparable to that of helicopters.

12.2.7.1 Exceedance of Noise Standards

The discussion under the Surveillance Alternative related to the use of light trucks and ATVs, airboats, other boats, and sprayers is applicable to the Chemical Control Alternative because similar types of vehicles and equipment would be used, they would have comparable noise levels, and they also would be used for brief periods of time over multiple locations. The use of foggers would generate less noise than sprayers. Their use would result in a temporary noise increase at any given location, which would not exceed noise standards. Helicopters or fixed-wing aircraft would be used under this alternative; however, they would be used only briefly in any given area and generally would operate in open-space or agricultural areas, although other land use types could be affected as well. The brief increase in noise from the periodic use of helicopters and fixed-wing aircraft and other vehicles and equipment would not exceed noise standards.

> **Impact N-9:** Use of equipment and vehicles under the Chemical Control Alternative would increase noise levels during operations, but this increase would not exceed regulatory thresholds. This impact is **less than significant** based on the frequency and duration of the activity and resulting noise levels. No mitigation is required.
>
> **Impact N-10:** Helicopter/aircraft/airboat use under the Chemical Control Alternative would temporarily increase noise levels during operations, but would not exceed regulatory thresholds. This impact is **less than significant** based on the frequency and duration of the activity and resulting noise levels. No mitigation is required.

12.2.7.2 Substantial Temporary Increase in Noise Levels

The discussion under the Surveillance Alternative related to the use of light trucks and ATVs, airboats, other boats, and sprayers is applicable to the Chemical Control Alternative because similar types of vehicles and equipment would be used, they would have similar noise levels, and they also would be used for brief periods of time over multiple locations. Foggers would generate less noise than sprayers; thus, their periodic use would not result in a substantial increase in noise levels. As discussed in the preceding section, helicopters/fixed-wing aircraft also would be used, but only for brief periods up to several times a year, and they would affect any given area only briefly. Noise from helicopter/aircraft use immediately after twilight would not be expected to result in sleep disturbance. While noise from helicopters/aircraft operating during nighttime hours could result in sleep disturbance for those in the immediate vicinity, most of this activity would take place over open-space areas that are not populated. Although some of the helicopters/aircraft could operate over all land -use types, the impacts on any one location would be minimized because they would move continuously to new areas. In addition, BMPs will be implemented as appropriate by providing advance notification of noise-generating activities expected to be of concern to the public and providing a means for registering public complaints about noise, thus further minimizing the potential for public annoyance.

> **Impact N-11:** Use of equipment and vehicles under the Chemical Control Alternative would cause a temporary increase in noise levels during operations. This increase would not be substantial and, therefore, is **less than significant** based on the frequency and duration of the activity, resulting noise levels, comparability to noise resulting from existing activities, and implementation of BMPs. No mitigation is required.
>
> **Impact N-12:** Helicopter/aircraft/airboat use under the Chemical Control Alternative would temporarily increase noise levels during operations, but this increase would not be substantial. This impact is **less than significant** based on the frequency and duration of the activity, resulting noise levels, and implementation of BMPs. No mitigation is required.

12.2.8 Other Nonchemical Control/Trapping Alternative

This alternative primarily includes the trapping of rodents and/or yellow jackets that pose a threat to public health and welfare; light trucks would be used to access sites. Table 12-10 shows the range of noise levels that light trucks typically would generate at a 50-foot distances from the source and the land uses that would be affected.

Table 12-10 Other Nonchemical Control/Trapping Alternative – Primary Equipment Use, Noise Levels, and Land Use Types

Activity	Application Equipment	Predicted Noise Level (dBA)		Land Uses Types				
		50 feet	400 feet	Residential	Commercial	Industrial	Agricultural	Open Space
Ground Surveillance & Application/Mgt	Light trucks	83	65	●	●	●	●	●

12.2.8.1 Exceedance of Noise Standards

The only land-based equipment operated near residential and commercial development would be light trucks, which are commonly used in such areas and would not increase noise levels beyond the established thresholds given that only a few trucks would be used and they would be in proximity to such uses only for a brief period of time. Noise generated would be similar to that which already occurs and would not exceed noise standards.

> **Impact N-13:** Use of equipment and vehicles under the Other Nonchemical Control/Trapping Alternative would increase noise levels during operations, but this increase would not exceed regulatory thresholds. This impact is **less than significant** based on the frequency and duration of the activity and resulting noise levels. No mitigation is required.

12.2.8.2 Substantial Temporary Increase in Noise Levels

Noise from the use of light trucks generally would not be distinguishable from ambient noise levels because it takes a doubling of traffic to increase noise levels by only 3 dB. The types of light trucks that would be used (e.g., pickup trucks and jeeps) are common, and a limited number of vehicles would be used and would be dispersed over a large area. Thus, their use would not result in a substantial temporary increase in noise levels.

> **Impact N-14:** Use of equipment and vehicles under the Other Nonchemical Control/Trapping Alternative would cause a temporary increase in noise levels during operations. This increase would not be substantial and, therefore, is **less than significant** based on the frequency and duration of the activity, resulting noise levels, comparability to noise resulting from existing activities, and implementation of BMPs. No mitigation is required.

12.2.9 Cumulative Impacts

Cumulative noise impacts are discussed in Section 13.10. In summary, the potential for cumulative impacts is low, and any impacts that did occur would be of short duration and less than significant. **The incremental noise impacts from any of the Program alternatives, individually or in combination for the entire Program, would not be cumulatively considerable and would not trigger cumulative noise impacts in a given area**.

12.2.10 Environmental Impacts Summary

Table 12-11 is a summary of all of the potential noise impacts associated with the Program alternatives in comparison to existing conditions. The number of each statement correlates to its number in the text.

Table 12-11 Summary of Noise Impacts by Alternative

Impact Statement	Surveillance	Physical Control	Vegetation Management	Biological Control	Chemical Control	Other Nonchemical/ Trapping
Effects on Noise						
Impact N-1: Use of equipment and vehicles under the Surveillance Alternative would increase noise levels during operations, but this increase would not exceed noise standards. This impact is **less than significant** based on the frequency and duration of the activity, resulting noise levels, and compliance with BMPs. No mitigation is required.	LS	na	na	na	na	na
Impact N-2: Use of equipment and vehicles under the Surveillance Alternative would cause a temporary increase in noise levels during operations. This increase would not be substantial and, therefore, is **less than significant** based on the frequency and duration of the activity, resulting noise levels, comparability to noise resulting from existing activities, and implementation of BMPs. No mitigation is required.	LS	na	na	na	na	na
Impact N-3: Use of equipment and vehicles under the Physical Control Alternative would increase noise levels during operations, but this increase would not exceed regulatory thresholds. This impact is **less than significant** based on the frequency and duration of the activity and resulting noise levels. No mitigation is required.	na	LS	na	na	na	na
Impact N-4: Use of equipment and vehicles under the Physical Control Alternative would cause a temporary increase in noise levels during operations. This increase would not be substantial, and therefore is **less than significant** based on the frequency and duration of the activity, resulting noise levels, comparability to noise resulting from existing activities, and implementation of BMPs. No mitigation is required.	na	LS	na	na	na	na

Table 12-11 Summary of Noise Impacts by Alternative

Impact Statement	Surveillance	Physical Control	Vegetation Management	Biological Control	Chemical Control	Other Nonchemical/ Trapping
Impact N-5: Use of equipment and vehicles under the Vegetation Management Alternative would increase noise levels during operations, but this increase would not exceed regulatory thresholds. This impact is **less than significant** based on the frequency and duration of the activity and resulting noise levels. No mitigation is required.	na	na	LS	na	na	na
Impact N-6: Use of equipment and vehicles under the Vegetation Management Alternative would cause a temporary increase in noise levels during operations. This increase would not be substantial, and therefore is **less than significant** based on the frequency and duration of the activity, resulting noise levels, comparability to noise resulting from existing activities, and implementation of BMPs. No mitigation is required.	na	na	LS	na	na	na
Impact N-7: Use of vehicles under the Biological Control Alternative would increase noise levels during operations, but this increase would not exceed regulatory thresholds. This impact is **less than significant** based on the frequency and duration of the activity and resulting noise levels. No mitigation is required.	na	na	na	LS	na	na
Impact N-8: Use of vehicles under the Biological Control Alternative would cause a temporary increase in noise levels during operations. This increase would not be substantial and, therefore, is **less than significant** based on the frequency and duration of the activity and resulting noise levels, and implementation of BMPs. No mitigation is required.	na	na	na	LS	na	na
Impact N-9: Use of equipment and vehicles under the Chemical Control Alternative would increase noise levels during operations, but this increase would not exceed regulatory thresholds. This impact is **less than significant** based on the frequency and duration of the activity and resulting noise levels. No mitigation is required.	na	na	na	na	LS	na

Table 12-11 Summary of Noise Impacts by Alternative

Impact Statement	Surveillance	Physical Control	Vegetation Management	Biological Control	Chemical Control	Other Nonchemical/ Trapping
Impact N-10: Helicopter/aircraft/airboat use under the Chemical Control Alternative would temporarily increase noise levels during operations, but would not exceed regulatory thresholds. This impact is **less than significant** based on the frequency and duration of the activity and resulting noise levels. No mitigation is required.	na	na	na	na	LS	na
Impact N-11: Use of equipment and vehicles under the Chemical Control Alternative would cause a temporary increase in noise levels during operations. This increase would not be substantial and, therefore, is **less than significant** based on the frequency and duration of the activity, resulting noise levels, comparability to noise resulting from existing activities, and implementation of BMPs. No mitigation is required.	na	na	na	na	LS	na
Impact N-12: Helicopter/aircraft/airboat use under the Chemical Control Alternative would temporarily increase noise levels during operations, but this increase would not be substantial. This impact is **less than significant** based on the frequency and duration of the activity, resulting noise levels, and implementation of BMPs. No mitigation is required.	na	na	na	na	LS	na
Impact N-13: Use of equipment and vehicles under the Other Nonchemical Control/Trapping Alternative would increase noise levels during operations, but this increase would not exceed regulatory thresholds. This impact is **less than significant** based on the frequency and duration of the activity and resulting noise levels. No mitigation is required.	na	na	na	na	na	LS

Table 12-11 Summary of Noise Impacts by Alternative

Impact Statement	Surveillance	Physical Control	Vegetation Management	Biological Control	Chemical Control	Other Nonchemical/ Trapping
Impact N-14: Use of equipment and vehicles under the Other Nonchemical Control/Trapping Alternative would cause a temporary increase in noise levels during operations. This increase would not be substantial and, therefore, is **less than significant** based on the frequency and duration of the activity, resulting noise levels, comparability to noise resulting from existing activities, and implementation of BMPs. No mitigation is required.	na	na	na	na	na	LS

LS = Less-than-significant impact
N = No impact
na = Not applicable
SM = Potentially significant but mitigable impact
SU = Significant and unavoidable impact

12.2.11 Mitigation and Monitoring

No mitigation measures or monitoring are required because no significant impacts were identified.

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