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None

12 Noise

Chapter 12 evaluates potential noise impacts from Program implementation. Results of the evaluation 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

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 utilized. 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.

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, hand-held	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
Ringling 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
Heavy city traffic	90
Lawn mower	91-98
Chain saw	100-120

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

Noise Source	Sound Level in dBA
Jet aircraft at 500 feet overhead	115
Human pain threshold	120
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.

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, plans, and regulations pertaining to environmental noise within the nine-county Program Area are cited in this section. In addition, a representative selection of counties and cities throughout California that may be potentially treated is cited.

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.

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	Green	Green	Green	Green	Green	Green	Green	Green
Residential – Multifamily	Green	Green	Green	Green	Green	Green	Green	Green
Transient Lodging – Motel, Hotel	Green	Green	Green	Green	Green	Green	Green	Green
Schools, Libraries, Churches, Hospitals, Nursing Homes	Green	Green	Green	Green	Green	Green	Green	Green
Auditorium, Concert Hall, Amphitheaters	Green	Green	Green	Green	Green	Green	Green	Green
Sports Arena, Outdoor Spectator Sports	Green	Green	Green	Green	Green	Green	Green	Green
Playgrounds, Neighborhood Parks	Green	Green	Green	Green	Green	Green	Green	Green
Golf Courses, Riding Stables, Water Recreation, Cemeteries	Green	Green	Green	Green	Green	Green	Green	Green
Office Buildings, Business Commercial and Professional	Green	Green	Green	Green	Green	Green	Green	Green
Industrial, Manufacturing, Utilities, Agriculture	Green	Green	Green	Green	Green	Green	Green	Green

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 1998

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 noise ordinances for Contra Costa County and the cities of Brentwood, El Cerrito, Richmond and San Ramon 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 Program 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 (IMVMP) addressed in this PEIR. Noise elements are, therefore, not discussed further.

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.

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 2012.
- > Reviewed federal, state, and selected 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 existing vector control programs (existing conditions).
- > Considered the implementation of the following BMPs used by the Districts for operations that generate noise expected to be of concern to the public.
 - Measure 1: Provide Advance Notices. A variety of measures are implemented depending on the nature/magnitude of the activities and the District involved, including press releases, social media, District websites, hand-delivered flyers, posted signs, emails, and 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.
 - Measure 2: Provide Mechanism to Address Complaints. The District staff is available during regular business hours to respond to service calls and may staff phone lines to address concerns during nighttime operations.
 - Measure 3: Follow Established Procedures for Airboat Operations. Airboat operators are limited to certain areas and follow the guidelines established for those areas.
- > 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, Tables 4-1 through 4-7.

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 implemented BMPs to avoid and minimize impacts from their Program activities. The analysis of impacts considered the implementation of the following BMPs (from Table 2-9: BMPs A8, A11, and A12, respectively) that are used by the District 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.
- > 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.
- > 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 magnitude/nature of the activities undertaken by the District, and may include, but are not limited to, press releases, hand-delivered flyers, and posted signs. Public agencies and elected officials also may be notified of the nature and duration of the activities, including the Board of Supervisors or City Council, environmental health and agricultural agencies, emergency service providers, and airports.
 - Measure 2: Provide Mechanism to Address Complaints: District staff is available during regular business hours to respond to service calls and address concerns about nighttime operations.

12.2.3 Surveillance Alternative

The Surveillance Alternative would involve both ground surveillance and water surveillance. The number and type of vehicles and equipment required would vary by District, as shown in Table 12-4, but typically, 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 sprayers and most frequently would occur in agricultural and open-space areas including wildlife refuges, where noise-sensitive human receptors are typically not located. Table 12-4 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 12-4 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	ATVs	87	69				•	•
	Boat	75-85	57-67					•

12.2.3.1 Exceedance of Noise Standards

As discussed in Section 12.1.5.3, many jurisdictions specifically exempt activities intended to protect public health and safety, such as those implemented under the Proposed Program, from their noise standards. Other noise standards address either temporary construction noise or long-term or permanent noise sources, which are not relevant to the types of activities implemented as part of this Program. Some jurisdictions include provisions for brief periods of noise that exceed their land use compatibility standards, which are based on average daily noise levels, such as L_{dn} or CNEL. 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 noise levels shown in Table 12-4 represent those that would be generated while the equipment or vehicles were operating, and they would not operate constantly; thus, daily average noise levels would be considerably lower. Noise from light trucks would not exceed the long-term land use compatibility guidelines at nearby sensitive receptors because a limited number of vehicles would be used; any change to the average noise level would not be perceptible because it takes a doubling of trips to increase noise levels by only 3 dBA. ATVs and other equipment would be used primarily in agricultural and open-space areas, as well as industrial areas. Such areas are not typically considered noise-sensitive. Although certain types of open-space areas may have increased sensitivity to noise, such as those used by recreational users seeking quiet, 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 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.

12.2.3.2 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. Water surveillance activities would occur in agricultural and open-space areas, not in proximity to noise sensitive receptors; moreover, limited numbers of

equipment and vehicles would be used for brief periods of time over a large area. Given the sporadic use of vehicles and equipment 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, BMPs would 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. Airboats also would be required to operate only in certain areas, as allowed by the land management agencies, minimizing the potential for impacts in other areas.

Impact N-2: Use of equipment and vehicles 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 generated by the Districts; they include educating and advising landowners regarding appropriate methods to control 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 management associated with wastewater treatment facilities.

As shown in Table 12-5, ground management would require the periodic use of light trucks, such as pickup trucks and jeeps, and ATVs. Water management would require the use of ATVs and, occasionally, boats. In addition to the primary vehicles and equipment that would be used by each District, Table 12-5 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 12-5 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	•	•	•	•	•
	ATVs	87	69				•	•

12.2.4.1 Exceedance of Noise Standards

The discussion under the Surveillance Alternative is generally applicable to the Physical Control Alternative because similar types of vehicles and equipment would be used, or they would generate

similar amounts of noise and be used for a similar length of time. Noise generated by the Physical Control Alternative would not exceed noise standards due to the sporadic, temporary nature of the impact.

Impact N-1: Use of equipment and vehicles 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 is generally applicable to the Physical Control Alternative because similar types of vehicles and equipment would be used, or they would generate similar amounts of noise and be used for a similar length of time. The types of activities that would occur under this alternative already are being implemented by the Districts and noise impacts, therefore, would be comparable to those that already occur. In addition, BMPs would be implemented as appropriate by providing advance notification of noise-generating activities expected to be of concern to the public based on past complaints 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 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 teaching landowners 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 or thinning and sometimes would apply herbicides (chemical pesticides with specific toxicity to plants) to improve surveillance or reduce vector habitats. Vegetation removal or thinning primarily occurs in aquatic habitats to assist with 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 (or request the structures' owners to perform this task). Tools ranging from shovels and pruners to chain saws 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 prevents good water management practices that would minimize mosquito populations. Generally, however, District "brushing" activities rely almost entirely on hand tools.

The number and type of vehicles and equipment required would vary by District, as shown in Table 12-6, but typically, 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, chain saws, and weed eaters. Water surveillance would require the use of ATVs and, occasionally, boats and sprayers. In addition to the vehicles and equipment that would be used by the Districts, Table 12-6 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. Shovels and other hand tools that generate no noise or minimal noise are not included in this table.

Table 12-6 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	•	•	•	•	•

12.2.5.1 Exceedance of Noise Standards

The discussion under the Surveillance Alternative is generally applicable to the Vegetation Management Alternative because similar types of vehicles and equipment would be used, or they would have comparable noise levels and 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 exceed noise standards.

Impact N-1: Use of equipment and vehicles 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 generally is applicable to the Vegetation Management Alternative because similar types of vehicles and equipment would be used, or they would have comparable noise levels and 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. In addition, BMPs would 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. Airboats also would be required to operate only in certain permitted areas, minimizing the potential for impacts in other areas.

Impact N-2: Use of equipment and vehicles 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 water bodies only), and occasionally, ATVs, boats, tractors, and sprayers (for the pathogens which are discussed under the Chemical Control Alternative for most resources). Examples of bacteria pathogenic to mosquitoes are Bs, the several strains of Bti, and *Saacharopolyspora spinosa*. (or spinosad). San Mateo County Mosquito and

Vector Control District would use helicopters for up to approximately 5 hours a day, approximately 6 days a year. Helicopters would be used in residential, commercial, and open-space areas, remaining at any one location only briefly. Marin/Sonoma Mosquito and Vector Control District also would use helicopters for approximately 2 hours a day, up to approximately 14 days a year. A potential exists for these and other Districts to use fixed-wing aircraft as well, and other Districts also could use helicopters in the future; all land use types potentially could be treated through aerial applications as well. Aerial operations for adulticiding may be conducted in the dark of the night, typically after twilight or early in the morning before dawn. 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, thus minimizing the amount of time that aircraft are present at any one location.

The number and type of vehicles and equipment required would vary by District, as shown in Table 12-7, 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.

Table 12-7 Biological Control –Primary Equipment Use, Noise Levels, and Land Use Types

Activity	Application Equipment	Predicted Noise Level (dBA)			Land Use Types				
		50 feet	400 feet	500 feet	Residential	Commercial	Industrial	Agricultural	Open Space
Ground Surveillance & Application/Mgt	Light trucks	83	65	—	•	•	•	•	•
	Sprayers	65	47	—					•

12.2.6.1 Exceedance of Noise Standards

The discussion under the Surveillance Alternative is generally applicable to the Biological Control Alternative because similar types of vehicles and equipment would be used, or they would have similar noise levels and also would be used for brief periods of time over multiple locations. Additionally, helicopters or other aircraft would be used under this alternative, but they, too, would operate only briefly in any given area. 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-1: Use of equipment and vehicles 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-3: Helicopter/aircraft use would temporarily 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 generally is applicable to the Biological Control Alternative because similar types of vehicles and equipment would be used, or they would have similar noise levels and also would be used for brief periods of time over multiple locations.

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 would be implemented as appropriate by providing advance notification of noise-generating activities expected to be of concern to the public based on past complaints and providing a means for registering public complaints about noise, thus further minimizing the potential for public annoyance. Airboats also would be required to operate only in certain permitted areas, minimizing the potential for impacts in other areas.

Impact N-2: Use of equipment and vehicles 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.

Impact N-4: Helicopter/aircraft/airboat use 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.

12.2.7 Chemical Control Alternative

A variety of activities would be implemented under the Chemical Control Alternative. Some activities, such as baiting, would not result in noise impacts, other than from the use of vehicles to access the bait treatment sites. Others would require more extensive use of vehicles and equipment.

The Districts would use a variety of techniques and equipment to apply mosquito larvicides, including hand-held sprayers, backpack sprayers and blowers, truck- or ATV-mounted spray rigs, and helicopters or other aircraft. The Districts use conventional pickup trucks and ATVs as larvicide vehicles. Equipment used in ground applications of liquid formulations include hand-held sprayers (handcans or spray bottles), and backpack sprayers and blowers. Hand-held 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 of larvicides is a relatively infrequent activity for the Districts, typically occurring only a few times each year/once every few years, with each application covering around 10 to 400 acres. Aerial application of liquid larvicides typically occurs during daylight hours and at an altitude above the treatment site of less than 40 feet. Granular applications would occur during daylight hours at a less-than-50-foot altitude.

The most common form of adulticide application is via insecticide aerosols at very low dosages using ULV- equipment mounted on trucks, ATVs, golf carts, and boats or hand-held for ground applications. Barrier or residual treatments for adult mosquitoes consist of an application using a material generally applied with a compressed air sprayer to the preferred foliage, buildings, or resting areas of the mosquito species.

Aerial applications using helicopters and fixed-wing aircraft are used to obtain effective control in areas bordered by extensive mosquito production sites or with small, narrow, or inaccessible network of roads.

The flight parameters differ by program and technique. Some operations fly 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 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.

The number and type of vehicles and equipment required would vary by District, 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. Noise from helicopters also is shown at a 500-foot distance. All land use types potentially could be treated through aerial applications, although those shown are the most likely to be affected.

Table 12-8 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	Sprayers	87	69	—	•	•	•	•	•
Water Surveillance & Applications/Mgt	ATVs	87	69					•	•
	Boat	75-85	57-67						•
	Sprayers	87	69				•	•	•
Aerial Applications*	Helicopters			84-89				•	•
	Airboat, other boats	75-95	57-77	—					•

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 discussions under the Surveillance Alternative and Biological Control Alternative are generally applicable to the Chemical Control Alternative because similar types of vehicles and equipment would be used, or they would have comparable noise levels and also would be used for brief periods of time over multiple locations. Helicopters or fixed-wing aircraft would be used under this alternative; 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.

Impact N-1: Use of equipment and vehicles 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-3: Helicopter/aircraft use 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 discussions under the Surveillance Alternative and Biological Control Alternative are generally applicable to the Chemical Control Alternative because similar types of vehicles and equipment would be used, or they would have similar noise levels and also would be used for brief periods of time over multiple locations. 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. In addition, BMPs would 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. Airboats also would be required to operate only in certain permitted areas, minimizing the potential for impacts in other areas.

Impact N-2: Use of equipment and vehicles 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-4: Helicopter/aircraft/airboat use 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, ATVs, and boats would be used to access sites. The number and type of vehicles and equipment required would vary by District, 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.

Table 12-9 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 discussion under the Surveillance Alternative is generally applicable to the Other Nonchemical Control/Trapping Alternative because similar types of vehicles and equipment would be used, or they would have comparable noise levels and 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 exceed noise standards.

Impact N-1: Use of equipment and vehicles 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

The discussion under the Surveillance Alternative generally is applicable to the Other Nonchemical Control/Trapping Alternative because similar types of vehicles and equipment would be used, or they would have comparable noise levels and 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. In addition, BMPs would 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. Airboats also would be required to operate only in certain permitted areas, minimizing the potential for impacts in other areas.

Impact N-2: Use of equipment and vehicles 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 12-10 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 12-10 Summary of Alternative Noise Impacts

Impact Statement	Surveillance	Physical Control	Vegetation Management	Biological Control	Chemical Control	Other Nonchemical/ Trapping
Effects on Noise						
<p>Impact N-1: Use of equipment and vehicles 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-1: Use of equipment and vehicles 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.</p>	LS	LS	LS	LS	LS	LS
<p>Impact N-2: Use of equipment and vehicles 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-2: Use of equipment and vehicles 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.</p>	LS	LS	LS	LS	LS	LS

Table 12-10 Summary of Alternative Noise Impacts

Impact Statement	Surveillance	Physical Control	Vegetation Management	Biological Control	Chemical Control	Other Nonchemical/ Trapping
Impact N-3: Helicopter/aircraft use would temporarily 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-3: Helicopter/aircraft use would temporarily 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	LS	na
Impact N-4: Helicopter/aircraft/airboat use 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. Impact N-4: Helicopter/aircraft/airboat use 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	LS	LS	na

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- 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.