

Section 15

Noise

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3 This section discusses the impacts of noise and vibration, and includes both construction and operations.
4 This section describes the associated study area, the environmental setting, the significance of potential
5 environmental impacts, and mitigation measures.

6 The Delta Plan (the Proposed Project) does not propose implementation of any particular physical project;
7 rather it seeks to influence, either through limited policy regulation or through recommendations, other
8 agencies to take certain actions that will lead to achieving the dual goals of Delta ecosystem protection
9 and water supply reliability. Those actions, if taken, could lead to physical changes in the environment.
10 This is described in more detail in part 2.1 of Section 2A, Proposed Project and Alternatives, and in
11 Section 2B, Introduction to Resource Sections.

12 The types of noise-generating construction activities that may occur with implementation of Delta Plan-
13 encouraged projects include earth moving, excavation of fill, importing and exporting fill material, pile
14 driving, dredging, barge traffic, and generators among others including small hand held equipment.
15 Construction noise would be associated with water supply reliability, ecosystem restoration, water quality
16 improvement, flood risk reduction, and recreation actions primarily in the Delta and in the Delta
17 watershed and to a lesser extent in areas outside the Delta that use Delta water. The types of noise-
18 generating operational activities consist primarily of pumping (groundwater, surface water, and sea
19 water). Increased recreational use at new parks, wildlife viewing areas, and hunting are considered
20 operations-related noise generated by the Delta Plan-encouraged projects.

21 Construction-related impacts would be potentially significant, but could be reduced to less than
22 significant when feasible mitigation measures can be implemented. The Delta Stewardship Council does
23 not have the authority to require the adoption of mitigation in all cases. Therefore, some construction
24 activities conducted by other agencies on the basis of Delta Plan recommendations (i.e., activities that are
25 not covered actions), may not be mitigated to a less-than-significant level. For example, this might occur
26 when the agency allows 24-hour construction in conflict with a city or county noise ordinance. Likewise,
27 long-term noise from facilities operated by agencies that the Delta Stewardship Council cannot require
28 mitigation may exceed city or county standards.

29 An example of this situation might be locating a parking lot for a recreational facility near a sensitive
30 receptor without an adequate setback for a noise buffer. In both of these cases, potential short-term
31 construction and long-term operation noise impacts could be significant and unavoidable. This section
32 evaluates and discloses the significance of noise impacts before and after the implementation of
33 mitigation measures.

15.1 Study Area

The study area is defined as the geographical area in which the majority of potential impacts are expected to occur. The noise study area consists of Sacramento County, Yolo County, Solano County, San Joaquin County, and Contra Costa County that are within the Delta and Suisun Marsh. No noise receptors exist in the portion of Alameda County included in the Delta, so this county is not discussed further in this analysis. It is not anticipated that changes outside this noise study area within the Delta would occur as a result of implementing the Delta Plan or the project alternatives. As described in Section 2A, Proposed Project and Alternatives, facilities could be constructed, modified, or reopened in the Delta, Delta watershed, or areas located outside the Delta that use Delta water. It is unclear where actions would be located. While it is unclear where the Proposed Project might have effects outside the Delta, this section discusses the general types of noise effects that might occur in the Delta watershed and areas outside the Delta that use Delta water.

15.2 Regulatory Framework

Appendix D, Regulatory Framework, provides an overview of the plans, policies, and regulations relating to noise within the study area.

15.3 Background and Terminology

Noise is often described as unwanted sound. Sound is defined as any pressure variation in air that the human ear can detect. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second, called hertz (Hz). Table 15-1 provides definitions of acoustic terminology used in this section.

Table 15-1
Acoustic Terminology

Term	Definition
Acoustics	The science of sound.
Ambient noise	The distinctive acoustical characteristics of a given space, consisting of all noise sources audible at that location. In many cases, the term "ambient" is used to describe an existing or pre-project condition, such as the setting in an environmental noise study.
Attenuation	The reduction of an acoustic signal.
A-weighting	A frequency-response adjustment of a sound-level meter that conditions the output signal to approximate human response.
Community noise equivalent level (CNEL)	The 24-hour average noise level with noise occurring during evening hours (7:00–10:00 p.m.) weighted by a factor of 3 and noise occurring during nighttime hours (10:00 p.m.–7:00 a.m.) weighted by a factor of 10 before averaging.
Decibel (dB)	A fundamental unit of sound. A bel is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A decibel is one-tenth of a bel.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second, or Hz.
Ldn	Day/night average sound level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.

Table 15-1
Acoustic Terminology

Term	Definition
Sound exposure level	A rating, in decibels, of a discrete event, such as an aircraft flyover or train pass-by, that compresses the total sound energy of the event into a 1-second period.
Threshold of hearing	The lowest sound threshold that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of pain	Approximately 120 dB above the threshold of hearing.

Source: Caltrans 2009, pp. 9-1–9-19

1 Measuring sound directly in terms of pressure would require a large and awkward range of numbers.
 2 To avoid this, the dB scale was devised. The dB scale uses the hearing threshold (20 micropascals of
 3 pressure) as a point of reference, defined as 0 dB. Other sound pressures are then compared to the
 4 reference pressure, and the logarithm is used to keep the numbers in a practical range. The decibel scale
 5 allows a millionfold increase in pressure to be expressed as 120 dB. Another useful aspect of the dB scale
 6 is that changes in levels (dB) correspond closely to human perception of relative loudness. Table 15-2
 7 shows examples of noise levels for several common noise sources and environments.

Table 15-2
Typical Sound Levels Measured in the Environment and Industry

A-weighted Sound Level in Decibels	Qualitative Description
130	Threshold of pain
120	Jet aircraft takeoff at 100 feet
110	Riveting machine at operator's position
100	Shotgun at 200 feet
90	Bulldozer at 50 feet
80	Diesel locomotive at 300 feet
70	Commercial jet aircraft interior during flight
60	Normal conversation speech at 5–10 feet
50	Open office background level
40	Background level within a residence
30	Soft whisper at 2 feet
20	Interior of recording studio

Source: Adapted from New York Department of Environmental Conservation 2001, p. 19

8 As shown in Table 15-2, noise can be generated by numerous sources: mobile (transportation-related)
 9 sources such as automobiles, trucks, and airplanes, and stationary (nontransportation-related) sources such
 10 as construction activity and commercial and industrial operations. Perceived noise declines the greater the
 11 distance is from the source. As acoustic energy spreads through the atmosphere from the source to the
 12 receiver, noise levels attenuate (decrease) depending on ground absorption characteristics, atmospheric
 13 conditions, and the presence of physical barriers.

14 Depending on the intervening ground type between the source and the receptor, noise generated from
 15 mobile sources attenuate at a rate of 3 dB (typical for hard surfaces, such as asphalt) to 4.5 dB (typical for
 16 soft surfaces, such as grasslands) per doubling of distance. Stationary noise sources attenuate at a rate of
 17 6 to 7.5 dB per doubling of distance, depending on the intervening ground type between the source and
 18 the receptor (Caltrans 2009, pp. 2-29 and 2-32). Atmospheric conditions, such as wind speed, turbulence,
 19 temperature gradients, and humidity, may additionally alter the propagation of noise and affect levels at a

1 receptor. Furthermore, the presence of a large object (e.g., barriers, topographic features, intervening
2 building façades) between the source and the receptor can significantly reduce noise levels. Natural
3 barriers, such as berms, hills, or thick dense woods, and human-made features, such as stockpiles,
4 buildings, and walls, may be effective noise barriers (Caltrans 2009, pp. 2-34–2-41).

5 **15.3.1.1 Effects of Noise on People**

6 The perception of loudness is predictable and can be approximated by weighing the frequency response of
7 a sound level meter by means of the standardized A-weighting network (known as A-weighted decibels,
8 or dBA). There is a strong correlation between A-weighted sound levels and community response to
9 noise. For this reason, the A-weighted sound level has become the standard tool of environmental noise
10 assessment.

11 Community noise is commonly described in terms of the ambient noise level, which is defined as the
12 all-encompassing noise level associated with a given environment. A common statistical tool to measure
13 the ambient noise level is the average, or equivalent, sound level (L_{eq}) over a given period (usually
14 1 hour). The L_{eq} is the foundation of the day-night average level noise descriptor, L_{dn} , and shows very
15 good correlation with community response to noise.

16 The day-night average level (L_{dn}) is based on the average noise level over a 24-hour day, with a +10-dBA
17 weighting applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime
18 penalty is based on the assumption that people react to nighttime noise exposures as though they were
19 twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise
20 short-term variations in the noise environment.

21 To control noise from fixed sources that have developed from processes other than zoning or land use
22 planning, many jurisdictions have adopted community noise control ordinances. Such ordinances are
23 intended to abate noise nuisances and to control noise from existing sources. They also may be used as
24 performance standards to judge the creation of a potential nuisance or potential encroachment of sensitive
25 uses on noise-producing facilities. Community noise control ordinances are generally designed to resolve
26 noise conflicts attributable to stationary sources (usually by means of hourly noise level criteria), rather
27 than the 24-hour L_{dn} , which is typically used for evaluating transportation sources.

28 Because many rural residential areas experience low noise levels, residents may express concern about
29 the introduction of a sound that was not audible previously. In quiet environments, the introduction of
30 virtually any change in local activities will cause an increase in noise levels. Audibility of a new noise
31 source and/or increases in noise levels within recognized acceptable limits are not usually considered to
32 be significant noise impacts, but these concerns should be addressed and considered in the planning and
33 environmental review processes.

34 **15.3.1.2 Vibration**

35 Vibration is similar to noise in that it is a pressure wave traveling through an elastic medium, such as air;
36 however, vibration occurs as a result of high-frequency energy input on a structure or surface, such as in
37 buildings or the ground. Vibration may be caused by either natural phenomena (e.g., earthquakes,
38 volcanic eruptions, sea waves, landslides) or human activity (e.g., explosions, operation of machinery,
39 traffic, trains, construction equipment). Vibration sources may be continuous (e.g., operating factory
40 machinery) or transient (e.g., explosions).

41 Vibration levels are characterized by amplitude and frequency and are commonly expressed in peak
42 particle velocity (PPV). PPV is the maximum instantaneous positive or negative peak of a vibration
43 signal. Transient and impact vibration typically are expressed in PPV, which correlates well to the
44 stresses experienced by buildings (FTA 2006, pp. 7-1–7-8; Caltrans 2004, pp. 5-7). PPV is normally
45 described in inches per second.

1 Vibration effects on humans are evaluated in terms of root mean square vibration velocity that is
 2 expressed in VdB, as shown in Table 15-3. The range of vibration that is considered relevant occurs from
 3 approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is
 4 the general threshold where minor damage can occur in fragile buildings (FTA 2006, pp. 8-1–8-8).

Table 15-3
Human Response to Different Levels of Groundborne Noise and Vibration

Vibration-Velocity Level	Human Reaction
65 VdB	Approximate threshold of perception.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.
85 VdB	Vibration acceptable only if there is an infrequent number of events per day.

Source: FTA 2006, pp. 7-8

VdB: vibration decibels referenced to 1 microinch per second and based on the root mean square velocity amplitude.

5 Vibration in the community has often been cited as a health problem in terms of inhibiting general
 6 well-being and contributing to undue stress and annoyance. Vibration can interfere with human activities,
 7 including sleep, speech, recreation, and tasks demanding concentration or coordination. Some typical
 8 community sources of perceptible vibration are construction equipment, steel-wheeled trains, and traffic
 9 on rough roads. Although effects may be imperceptible at low levels, at moderate and high levels,
 10 groundborne vibration may result in detectable vibrations and slight damage to nearby structures,
 11 respectively. At the highest levels of vibration, damage to structures is primarily architectural
 12 (e.g., loosening and cracking of plaster or stucco coatings) and rarely results in damage to structural
 13 components.

14 15.4 Environmental Setting

15 This section describes the existing noise environment in the Delta and the Suisun Marsh and Delta
 16 watershed and areas outside the Delta that use Delta water, and the receptors that may potentially be
 17 affected by noise and vibration.

18 15.4.1 Major Sources of Information

19 Land use and transportation maps prepared for and incorporated into this environmental impact report
 20 (EIR) were consulted to identify both noise sources (e.g., industrial areas, transportation facilities) and
 21 noise-sensitive land uses (e.g., residential areas).

22 15.4.2 Delta and Suisun Marsh

23 15.4.2.1 Existing Noise Sources

24 15.4.2.1.1 Sacramento County

25 Noise sources in western Sacramento County, City of Sacramento, Elk Grove, and Isleton include
 26 stationary sources and mobile sources (transportation activities). Mobile noise sources include agricultural
 27 operations, parks and school playing fields, landscape maintenance, and commercial and industrial
 28 sources. Commercial and industrial sources include heating and cooling equipment, natural gas
 29 compression stations, and heavy equipment use. Transportation noise sources include the following:

30 " Traffic along the corridors of Interstate 5 (I-5) and Interstate 80 (I-80), Highway 50, and State
 31 Route (SR) 160

- 1 " Rail operations for freight and passenger traffic
- 2 " Aircraft from the Sacramento International Airport, Sacramento Executive Airport, Franklin Field
- 3 " Airport, and Borges-Clarksburg Airport
- 4 " Motorized boats along the Sacramento River

5 **15.4.2.1.2 Yolo County**

6 Noise sources in eastern Yolo County and West Sacramento include stationary sources and mobile
7 sources (transportation activities). Stationary noise sources include agricultural operations, parks and
8 school playing fields, landscape maintenance, and commercial and industrial sources. Commercial and
9 industrial sources include heating and cooling equipment, natural gas compression stations, and heavy
10 equipment use are also stationary sources of noise.

11 Mobile noise sources include the following:

- 12 " Traffic noise along the corridors of I-5, I-80, and SR-84
- 13 " Rail operations for freight and passenger traffic
- 14 " Aircraft from the Sacramento International Airport and Bourges-Clarksburg Airport
- 15 " Boats along the Sacramento River

16 **15.4.2.1.3 Solano County**

17 Noise in Solano County, which includes Rio Vista, Fairfield, Benicia, Suisun City, the Suisun Marsh, and
18 a portion of the northern Delta, is generated by stationary and mobile sources. Stationary noise sources in
19 the county include agricultural operations, parks and school playing fields, landscape maintenance, and
20 commercial and industrial sources. Commercial and industrial sources include heating and cooling
21 equipment, natural gas compression stations, and heavy on-site equipment use. Mobile sources include
22 the following:

- 23 " Traffic noise along the corridors of I-680 and SR-84, -113, -160, and -12
- 24 " Rail operations for freight and passenger traffic
- 25 " Aircraft from the Rio Vista Municipal Airport, Travis Air Force Base, and Nut Tree Airport
- 26 " Motorized boats along the Sacramento River

27 **15.4.2.1.4 San Joaquin County**

28 Noise sources in western San Joaquin County, including Stockton, Lathrop, Manteca, and Tracy, include
29 stationary and mobile (transportation) sources. Stationary noise sources include agricultural operations,
30 parks and school playing fields, landscape maintenance, and commercial and industrial sources.
31 Commercial and industrial sources include heating and cooling equipment, natural gas compression
32 stations, and heavy equipment use. Transportation noise sources include the following:

- 33 " Traffic along the corridors of I-5 and SR-4 and -12
- 34 " Rail operations for freight and passenger traffic
- 35 " Aircraft from the Stockton Metropolitan Airport, Kingdon Airpark, Lodi Airport, Lodi Airpark,
- 36 " Tracy Municipal Airport, and New Jerusalem Airport
- 37 " Boats along the San Joaquin River

38 **15.4.2.1.5 Contra Costa County**

39 Noise sources in eastern Contra Costa County, northern Pittsburg, eastern Antioch, Oakley, and
40 Brentwood include stationary sources and mobile (transportation) sources. Stationary noise sources
41 include agricultural operations, parks and school playing fields, landscape maintenance, and commercial

1 and industrial sources. Commercial and industrial sources include heating and cooling equipment, natural
2 gas compression stations, and heavy equipment use. Mobile sources include the following:

- 3 " Traffic noise along the corridors of SR-4 and -160
- 4 " Rail operations for freight and passenger traffic
- 5 " Aircraft from the Byron Airport and Buchanan Field
- 6 " Motorized boats along the San Joaquin River

7 **15.4.2.2 Existing Noise-sensitive Land Uses**

8 **15.4.2.2.1 Sacramento County**

9 Sacramento County land in the Delta is primarily in agricultural, recreation, natural preserve, and open
10 space uses. Residential, commercial, and industrial uses are concentrated in the communities and cities
11 (including Sacramento and Isleton) in the Delta (see Section 6, Land Use and Planning). Residential uses,
12 natural preserves, and open space uses are the primary noise-sensitive land uses within the county.

13 **15.4.2.2.2 Yolo County**

14 Yolo County land in the Delta is primarily in agricultural use. Public residential, commercial, office and
15 industrial, private recreation, and vacant land uses also exist within the county. Residential, commercial,
16 and industrial uses are concentrated in the community of Clarksburg, in the east-central portion of the
17 county along the border of Yolo and Sacramento counties, and in the City of West Sacramento.
18 Residential uses are the primary noise-sensitive land uses within the county.

19 **15.4.2.2.3 Solano County**

20 Solano County land in the Delta and Suisun Marsh is primarily in agricultural or natural resources use in
21 unincorporated areas. Rural residential development has occurred in various communities in the
22 unincorporated county. Residential and commercial land uses are concentrated in highway areas and in
23 Rio Vista, Fairfield, Benicia, and Suisun City. Residential uses are the primary noise-sensitive land uses
24 within the county.

25 **15.4.2.2.4 San Joaquin County**

26 San Joaquin County land in the Delta is primarily in agricultural use. Residential, commercial, industrial,
27 and public facilities are mostly adjacent to the cities of Stockton, Lathrop, western Manteca, and Tracy.
28 Natural preserves, open space uses, and residential land uses are the primary noise-sensitive land uses
29 within the county.

30 **15.4.2.2.5 Contra Costa County**

31 Contra Costa County land in the Delta is primarily in agricultural and recreational use. Residential,
32 commercial, industrial, and open space land uses also exist in the unincorporated and incorporated areas
33 of the county. Residential, commercial, and industrial uses are concentrated in the City of Oakley, in
34 eastern Contra Costa County. Residential uses are the primary noise-sensitive land uses within the county
35 and are concentrated in the cities of Pittsburg, Antioch, Oakley, and Brentwood, and the unincorporated
36 community of Byron (see Section 6, Land Use and Planning).

37 **15.4.3 Delta Watershed**

38 Existing sources of noise and vibration in the Delta watershed area are primarily from roadway traffic,
39 rail, aircraft noise, and other sources, such as farming, mining, timber harvesting, industrial, and
40 construction equipment. Noise is also generated by watercraft and by stationary noise sources such as
41 mechanical equipment.

1 Sensitive receptors consist of residences, transient lodging, wildlife viewing areas, and passive
2 recreational facilities. Major transportation corridors in agricultural and rural areas are generally focused
3 on interstate and State highways and railroads.

4 Interstate 5 (I-5) is the main north-south interstate freeway in the region. Several major arterials run
5 north-south, generally parallel to the Sacramento River. SR-99 and SR-70 run north-south; certain
6 sections of both of these routes are expressways. SR 273 runs north-south from Redding, generally
7 paralleling the Sacramento River before it intersects with I-5 several miles north of the Shasta/Tehama
8 county line. Major east-west routes on the east side of the Sacramento Valley include SR-70, -49, and -88;
9 U.S. Highway 50 (U.S. 50); and I-80.

10 The Union Pacific Railroad (UPRR) and Western Pacific Railroad both have rail lines serving the region.
11 The UPRR main line follows the I-5 alignment. The UPRR and Atchison, Topeka, and Santa Fe lines
12 provide primary rail service connecting the Delta region to the San Joaquin River basin. The alignments
13 of these rail lines generally follow the I-5 alignment through the San Joaquin Valley.

14 A number of airports of various sizes in terms of acreage and daily operations are located in the vicinity
15 of the Delta and Suisun Marsh. Twenty-one airports located in the Delta watershed in the vicinity of the
16 Delta and Suisun Marsh are shown on Figure 19-4.

17 Industrial, light industrial, commercial, and public service facilities that could produce objectionable
18 noise levels at nearby noise-sensitive uses are dispersed throughout the primary study area. Among these
19 fixed noise sources are lumber mills, auto maintenance shops, car washes, loading docks, recycling
20 centers, electricity generating stations, landfills, and athletic fields.

21 **15.4.4 Areas Outside the Delta That Use Delta Water**

22 As described in Section 2A, Proposed Project and Alternatives, facilities could be constructed, modified,
23 or reoperated areas outside of the Delta that use Delta water. Water use could also be modified in the
24 areas outside the Delta that use Delta water. Those areas include a wide range of land uses that range from
25 agricultural, rural residential, suburban, to high-density urban. Noise is less prevalent in agricultural,
26 rural, and rural-residential areas than in suburban and urban areas. Local agencies generally restrict
27 increased noise levels above ambient conditions.

28 Numerous freeways and expressways serve portions of the areas that use Delta water. U.S. 101 extends
29 north and south near the coast from San Luis Obispo south to Los Angeles, and I-5 runs north-south
30 through the Central Valley to Los Angeles and on to San Diego. An extensive, intricate freeway system
31 serves the Los Angeles area. I-10 runs east from Los Angeles to Arizona, while I-8 runs east-west from
32 San Diego to Arizona.

33 The UPRR line runs north-south near the coast, from the San Francisco Bay Area through Los Angeles,
34 then southeast toward the Arizona/Mexico border.

35 The Los Angeles–Long Beach installation on San Pedro Bay is one of the leading ports of California. The
36 growth of Los Angeles led to the creation of its artificial harbors. Other harbors in this area serving
37 commercial shipping include Port Hueneme, Los Angeles, Long Beach, and San Diego harbors.

15.5 Impacts Analysis of Project and Alternatives

15.5.1 Assessment Methods

The Delta Plan alternatives would not directly result in construction or operation of projects or facilities, and therefore would result in no direct noise impacts.

The Delta Plan alternatives could encourage the implementation of actions or activities by other agencies to construct and operate facilities or infrastructure that are described in Sections 2A, Proposed Project and Alternatives, and 2B, Introduction to Resource Sections. Examples of potential actions that could generate noise include the construction of water and wastewater treatment plants; conveyance facilities, including pumping plants; surface water or groundwater storage facilities; ecosystem restoration projects; flood control levees; or recreation facilities. Noise generated by operations include pumping and recreation uses. Implementation of these types of actions and construction and operation of these types of facilities could result in noise and vibration impacts.

The precise magnitude and extent of project-specific noise-related impacts would depend on the type of action or project being evaluated, its specific location, its total size, and a variety of project- and site-specific factors that are undefined at the time of preparation of this program-level EIR. Project-specific impacts would be addressed in project-specific environmental studies conducted by the lead agency at the time the projects are proposed for approval.

Noise and vibration impacts from implementation of the Delta Plan alternatives were evaluated by how project components could introduce temporary or permanent noise and vibration sources near noise-sensitive land uses (for example, residential) and the potential for noise levels to exceed applicable thresholds for these land uses. Because project-level construction details are not available for the project components analyzed, the proximity of noise and vibration sources to noise-sensitive land uses was evaluated for construction in many areas of California.

Potential noise levels were evaluated based on the type of noise-generating activity (e.g., construction), type of equipment that would likely be used, and expected duration of its use. Expected noise levels for short-term construction activities were estimated in terms of the worst-case noise exposure level that would be expected to occur at a distance of 50 feet from the source (L_{\max} dBA at 50 feet) based on the types of equipment likely to be used. Vibration impacts were evaluated in terms of the potential for these vibration sources to occur in proximity to sensitive land uses and based on the worst-case vibration level (PPV at 25 feet in inches per second [in/sec]) that would occur with the types of equipment that would likely be used. Permanent noise sources were evaluated based on the type of equipment and potential for noise levels to cause a substantial change in ambient noise levels where noise-sensitive land uses are located.

This EIR proposes mitigation measures for noise impacts. The ability of these measures to reduce noise impacts to less-than-significant levels depends on project-specific environmental studies; enforceability of these measures depends on whether or not the project being proposed is a covered action. This is discussed in more detail in Section 15.5.3.6 and in Section 2B, Introduction to Resource Sections.

1 15.5.2 Thresholds of Significance

2 Based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines, an impact related
3 to noise is considered significant if the Proposed Project would do any of the following:

- 4 " Expose persons to or generate noise levels in excess of standards established in the local general
5 plan or noise ordinance or applicable standards of other agencies
- 6 " Expose persons to or generate excessive groundborne vibration or noise levels
- 7 " Result in a substantial permanent increase in ambient noise levels in the project vicinity above
8 levels existing without the project
- 9 " Result in a substantial temporary or periodic increase in ambient noise levels in the project
10 vicinity above levels existing without the project
- 11 " For a project located within an airport land use plan or, where such a plan has not been adopted,
12 within 2 miles of a public airport or public-use airport, expose people residing or working in the
13 project area to excessive noise levels
- 14 " For a project within the vicinity of a private airstrip, expose people residing or working in the
15 project area to excessive noise levels

16 As described in Section 19, Transportation, Traffic, and Circulation, numerous airports are located in the
17 vicinity of the Delta and Suisun Marsh, including smaller private airstrips and public regional airports
18 (Figure 19-4). The Proposed Project would not introduce new inhabitants or workers that would reside or
19 work in the area of an airport or airstrip for an extended period. Therefore, these issues are not discussed
20 further in this EIR.

21 Temporary and short-term construction noise impacts would be considered significant if construction-
22 generated noise levels exceed the applicable standards at nearby noise-sensitive land uses. Several cities
23 and counties, such as the City of Sacramento and the counties of San Joaquin and Sacramento, have
24 exempted construction activities from restrictive noise limits during specified daytime hours. Although
25 each jurisdiction has adopted slightly different limits, they are generally consistent with one another for
26 normal working hours. The noise standards for applicable jurisdictions are provided in Appendix D,
27 Regulatory Framework.

28 Short-term vibration impacts would be significant if project construction or operation would result in the
29 exposure of sensitive receptors to, or would generate, vibration levels that exceed Caltrans' recommended
30 standard of 0.2 in/sec PPV. This standard relates to the prevention of structural damage for normal
31 buildings (Caltrans 2004) or the Federal Transit Administration's (FTA's) maximum acceptable vibration
32 standard of 80 VdB with respect to human response for residential uses (such as, annoyance) (FTA 2006)
33 at any nearby existing sensitive land uses.

34 Examples of uses that generate long-term vibration include railroads with frequent train trips and haul
35 routes with substantial numbers of continuous truck trips. Long-term vibration impact mechanisms would
36 be locating sensitive receptors, such as residential land uses, near these types of vibration-generating uses.
37 The Proposed Project would not result in the location of new residents near railroads or haul routes.
38 Therefore, long-term vibration is not discussed further in this EIR.

39 Operation of facilities would be considered to result in a significant noise impact if operations are
40 expected to result in noise that exceeds the existing or presumed ambient sound level by more than 5 dB
41 at sensitive receptor locations.

1 The following discussion of environmental impacts is limited to those potential impacts that could result
2 from actions or projects the Delta Plan alternatives could encourage. As individual activities are proposed
3 by other agencies, these individual activities will need to be evaluated in site-specific environmental
4 documents prepared by those agencies.

5 The impact analysis for the Proposed Project was structured to allow more detailed analysis of impacts as
6 they relate to the Delta Plan policy elements (Reliable Water Supply, Delta Ecosystem Restoration, Water
7 Quality Improvement, Flood Risk Reduction, Protection and Enhancement of Delta as an Evolving
8 Place). To avoid unnecessary repetition in the analysis of impacts that could occur under the alternatives
9 to the Proposed Project, each impact is discussed only once for each alternative.

10 15.5.3 Proposed Project

11 15.5.3.1 *Reliable Water Supply*

12 As described in Sections 2A, Proposed Project and Alternatives, and 2B, Introduction to Resource
13 Sections, the Delta Plan does not direct the construction of specific projects, nor would projects be
14 implemented under the direct authority of the Delta Stewardship Council. However, the Delta Plan seeks
15 to improve water supply reliability by encouraging various actions that, if taken, could lead to completion,
16 construction, and/or operation of projects that could provide a more reliable water supply. Such projects
17 and their features could include the following:

- 18 " Surface water projects (water intakes, treatment and conveyance facilities, reservoirs,
19 hydroelectric generation)
- 20 " Groundwater projects (wells, wellhead treatment, conveyance facilities)
- 21 " Ocean desalination projects (water intakes, brine outfalls, treatment and conveyance facilities)
- 22 " Recycled wastewater and stormwater projects (treatment and conveyance facilities)
- 23 " Water transfers
- 24 " Water use efficiency and conservation program implementation

25 The number and location of all potential projects that would be implemented are not known at this time.
26 Three possible projects, however, are known to some degree and are named in the Delta Plan: the North
27 of Delta Offstream Storage Investigation (aka Sites Reservoir), Los Vaqueros Reservoir Project (Phase 2),
28 and Upper San Joaquin River Basin Storage Investigation Plan (aka Temperance Flat). Of these three
29 projects, the Los Vaqueros Reservoir Project has undergone project-specific environmental review
30 (Los Vaqueros Reservoir Expansion EIS/EIR) (Reclamation et al. 2009). California Department of Water
31 Resources (DWR) Bulletin 118, which is also named in the Delta Plan, presents a list of 10 recommen-
32 dations for the management of groundwater but does not result in a specific project the construction or
33 operation of which could generate noise; therefore, Bulletin 118 is not evaluated in this section.

34 15.5.3.1.1 Impact 15-1a: Exposure of Sensitive Receptors to Excessive Temporary, Short-term 35 Construction Noise

36 Construction-related activities at construction sites for the types of reliable water supply actions or
37 projects and features the Delta Plan is encouraging generally would be the same and could require the use
38 of heavy equipment, such as excavators, graders, scrapers, bulldozers, backhoes, and concrete mixing and
39 pumping trucks. Depending on the type and model of equipment used for construction, noise levels would
40 range from 80 to 85 L_{max} dBA at 50 feet (FHWA 2006). Haul trucks that would be used to move borrow
41 and spoils and other materials could generate up to 88 L_{max} dBA at 50 feet.

1 Actual exposure levels would depend on the intensity of the construction activity and the distance of
2 sensitive receptors to the noise source. In the Delta, sensitive receptors that could be exposed include
3 residents of Sacramento, Elk Grove, Freeport, Hood, Courtland, Locke, Walnut Grove, Isleton, West
4 Sacramento, Clarksburg, Rio Vista, Fairfield, Benicia, Suisun City, Stockton, Lathrop, Manteca, Tracy,
5 Pittsburg, Antioch, Oakley, and Brentwood; and rural residents of Sacramento, Yolo, Solano, San
6 Joaquin, and Contra Costa counties located in the vicinity of construction activities or along public roads
7 that could be used for transporting construction equipment and materials. Applicable noise standards for
8 construction in the Delta would be those specified by county or city ordinance or general plan.

9 Actions or projects the Delta Plan is encouraging could be constructed within the Delta watershed and
10 areas outside the Delta that use Delta water. Construction of the projects encouraged by the Delta Plan
11 also could expose sensitive receptors in the vicinity of the construction and haul corridors to noise levels
12 exceeding applicable local standards.

13 It is unclear at this time how implementation of the Proposed Project would result in specific construction
14 activities, including the location, number, capacity, and methods and duration of construction activities.
15 However, the Delta Plan encourages at least to some degree implementation of the North of Delta
16 Offstream Storage Investigation, Los Vaqueros Reservoir Project (Phase 2), and the Upper San Joaquin
17 River Basin Storage Investigation Plan. These are possible new or expanded surface water storage
18 facilities.

19 The Los Vaqueros Project has undergone project-specific environmental review via an EIS/EIR; the other
20 two projects have not. The Los Vaqueros EIS/EIR, however, provides analogous information about the
21 impacts expected from construction of the two other projects, which are similar to the Los Vaqueros
22 Project. In addition, the project-specific EIR for another surface storage project (not named in the Delta
23 Plan)—the Calaveras Dam Replacement Project—also provides analogous information.

24 The Los Vaqueros Reservoir Expansion EIS/EIR (Reclamation et al. 2009) evaluated three alternatives to
25 increase water storage, a new Delta intake structure, and conveyance facilities. In this case, sensitive
26 noise receptors are located close to construction sites and would therefore be exposed to excessive
27 construction noise. The lead agency found that with implementation of mitigation measures, construction
28 of the Los Vaqueros Reservoir Expansion project would have a less-than-significant noise impact on
29 sensitive noise receptors.

30 The San Francisco Public Utilities Commission (SFPUC) found in the EIR prepared for the project that
31 the Calaveras Dam Replacement project (SFPUC 2011) could not ensure that construction noise impacts
32 to sensitive receptors would be reduced to less-than-significant levels. It was determined that it was not
33 feasible to silence backup warning systems on construction trucks, which would cause the sensitive noise
34 receptors to be exposed to noise levels that exceed applicable limits.

35 Impacts on noise-sensitive land uses in the Delta, Delta watershed, or areas outside the Delta that use
36 Delta water are expected to vary in a similar manner to these two examples. Construction of the types of
37 water supply reliability projects listed in Section 15.5.3.1 other than surface water storage (water intakes,
38 pumping plants, pipelines and tunnels, canals, regulating reservoirs, ocean desalination plants, and
39 hydroelectric generation facilities) generally would have noise impacts similar to the noise impacts
40 caused by the construction of surface water storage projects.

41 Although not named in the Delta Plan, the following projects, based on a review of their project-specific
42 EIRs, are illustrative of the types of construction-related noise impacts associated with water supply
43 reliability projects: the Davis-Woodland Water Supply Project (City of Davis 2007), which includes a
44 water intake in the Sacramento River, pumping plants, and conveyance and water treatment facilities; the
45 Huntington Beach Seawater Desalination Project (City of Huntington Beach 2010) and the Carlsbad
46 Precise Development Plan and Desalination Plant Project (City of Carlsbad 2005), both of which illustrate

1 some of the likely short-term noise impacts of constructing seawater desalination plants; and the Western
2 Municipal Water District Riverside-Corona Feeder Pipeline Project (WMWD and Reclamation 2011),
3 which includes the installation of a 28-mile-long underground pipeline and groundwater treatment, water
4 storage, and pumping facilities. The City of Davis found that constructing the diversion/intake structure
5 and groundwater well may require 24-hour construction, thereby making the implementation of noise
6 mitigation measures infeasible and resulting in a significant and unavoidable impact. The City of
7 Huntington Beach found that construction of the ocean desalination plant and appurtenant facilities would
8 have less-than-significant noise impacts through compliance with its noise ordinance. Likewise, the City
9 of Carlsbad found no potentially significant noise impacts from construction of an ocean desalination
10 facility. Western Municipal Water District found that installation of an underground water pipeline could
11 have significant construction-related noise impacts. Mitigation measures were required that reduced
12 construction-related noise impacts to a less-than-significant level.

13 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
14 time such projects are proposed by lead agencies. However, because of the potential for residents and
15 other sensitive receptors in the vicinity of related construction activities (e.g., in the vicinity of the
16 construction of a new intake facility) to experience exposure to noise exceeding applicable local
17 standards, the potential impacts are considered **significant**.

18 15.5.3.1.2 Impact 15-2a: Temporary and Short-term Exposure of Sensitive Receptors to Excessive 19 Groundborne Vibrations

20 Construction-related activities at construction sites for the types of reliable water supply actions or
21 projects and features the Delta Plan is encouraging (see Section 15.5.3.1) generally would be the same
22 and could require the use of pile drivers, large bulldozers, haul trucks, and jackhammers. These types of
23 equipment could generate groundborne vibrations ranging from 0.035 to 1.518 in/sec PPV at 25 feet, with
24 the range representing the maximum amplitude and frequency of vibration waves that could be caused by
25 these types of equipment (FTA 2006).

26 Actual exposure levels would depend on the distance between sensitive receptors and the vibration
27 source. Sensitive receptors that could be affected by groundborne vibrations are primarily structures.
28 Within the range of expected amplitude, groundborne vibrations would pose the greatest risk to extremely
29 fragile historic structures (buildings, ruins, ancient monuments), fragile buildings, historic structures
30 (buildings, bridges, gates, weirs, and other levee structures that are older than 50 years old) and some old
31 structures (less than 50 years old but not constructed to current building standards). In the Delta, sensitive
32 receptors that could be exposed are located in Sacramento, Elk Grove, Freeport, Hood, Courtland, Locke,
33 Walnut Grove, Isleton, West Sacramento, Clarksburg, Rio Vista, Fairfield, Benicia, Suisun City,
34 Stockton, Lathrop, Manteca, Tracy, Pittsburg, Antioch, Brentwood, and Oakley; and rural residents of
35 Sacramento, Yolo, Solano, San Joaquin, and Contra Costa counties located in the vicinity of construction
36 activities or along public roads that could be used for transporting construction equipment and materials.

37 It is unclear at this time how implementation of the Proposed Project would result in all construction
38 activities, including the location, number, capacity, and methods and duration of construction activities.
39 However, the Delta Plan encourages implementation of the following surface water storage projects:
40 North of Delta Offstream Storage Investigation, Los Vaqueros Reservoir Project, and the Upper San
41 Joaquin River Basin Storage Investigation Plan. The Los Vaqueros Project has undergone project-specific
42 environmental review via an EIS/EIR; the other two projects have not. The Los Vaqueros EIS/EIR,
43 however, provides analogous information about the impacts expected from construction of the two other
44 projects, which are similar to the Los Vaqueros Project. In addition, the project-specific EIR for another
45 surface storage project (not named in the Delta Plan)—the Calaveras Dam Replacement Project—also
46 provides analogous information.

1 The Los Vaqueros Reservoir Expansion EIS/EIR (Reclamation et al. 2009) evaluated increased water
2 storage, a new Delta intake structure, and conveyance facilities; blasting was one of the construction
3 methods. Where the Los Vaqueros Reservoir Expansion EIS/EIR found that sensitive noise receptors are
4 located close to construction sites and would therefore be exposed to excessive construction noise, the
5 sensitive noise receptors are located at a sufficient distance from vibration-generating construction
6 activities and would not to be affected by groundborne vibration. In addition to blasting, the Calaveras
7 Dam Replacement project (SFPUC 2011) involves the use of vibrators. In the Calaveras Dam
8 Replacement EIR, the lead agency found that vibration would have less-than-significant impacts on
9 sensitive receptors. No mitigation was required for either project.

10 As described in Section 15.5.3.1.1, additional documents reviewed for examples of potential impacts of
11 water supply reliability projects other than surface water projects include EIRs for the Davis-Woodland
12 Water Supply Project (City of Davis 2007), Huntington Beach Seawater Desalination Project (City of
13 Huntington Beach, 2010), Carlsbad Precise Development Plan and Desalination Plant Project (City of
14 Carlsbad 2005), and the Western Municipal Water District Riverside-Corona Feeder Pipeline Project
15 (WMWD and Reclamation 2011).

16 The City of Davis found that pile driving activities would be located at a sufficient distance from sensitive
17 receptors that would have less than significant groundborne vibration impacts. The City of Huntington
18 Beach found that buildings located near the greatest vibration causing construction activities were
19 designed and constructed at standards that would withstand the peak velocity vibrations; therefore,
20 groundborne vibrations would be less than significant. The City of Carlsbad and the West Municipal
21 Water District did not evaluate the effects of construction-related groundborne vibrations.

22 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
23 time such projects are proposed by lead agencies. However, because of the potential for sensitive
24 receptors in the vicinity of related construction activities (e.g., pile driving associated with a desalination
25 plant) to experience exposure to groundborne vibration levels exceeding recommended thresholds, the
26 potential impacts are considered **significant**.

27 15.5.3.1.3 Impact 15-3a: Long-term Exposure of Sensitive Receptors to Excessive Noise from 28 Operations

29 Operation of the types of projects mentioned in Section 15.5.3.1 could introduce new long-term noise
30 sources greater than ambient noise levels depending upon the location, types of operation, and worker and
31 public use of the new or modified facilities and distance to sensitive noise receptors. Generally, the major
32 sources of noise from these projects would be water pumps and, in the case of hydroelectric generation,
33 turbines and falling water.

34 In the Delta, sensitive receptors that could be exposed include residents of Sacramento, Elk Grove,
35 Freeport, Hood, Courtland, Locke, Walnut Grove, Isleton, West Sacramento, Clarksburg, Rio Vista,
36 Fairfield, Benicia, Suisun City, Stockton, Lathrop, Manteca, Tracy, Pittsburg, Antioch, Brentwood, and
37 Oakley; and rural residents of Sacramento, Yolo, Solano, San Joaquin, and Contra Costa counties located
38 in the vicinity of new pumping facilities. Water pumps have a typical noise level of 81 dBA at a distance
39 of 50 feet. Applicable noise standards for ongoing facility operations in the Delta would include those of
40 the counties and cities.

41 It is unclear at this time how implementation of the Proposed Project would create noise related to
42 operations of new water supply reliability facilities because the location, number, pump capacity and
43 other details are not currently known. However, the Delta Plan mentions possible implementation of the
44 following surface storage projects: North of Delta Offstream Storage Investigation, Los Vaqueros
45 Reservoir Project, and the Upper San Joaquin River Basin Storage Investigation Plan. The Los Vaqueros
46 Project has undergone project-specific environmental review via an EIS/EIR; the other two projects have

1 not. The Los Vaqueros EIS/EIR, however, provides analogous information about the impacts expected
2 from operation of the two other projects, which are similar to the Los Vaqueros Project. In addition, the
3 project-specific EIR for another surface storage project (not named in the Delta Plan)—the Calaveras
4 Dam Replacement Project—also provides analogous information.

5 The Los Vaqueros Reservoir Expansion EIS/EIR (Reclamation et al. 2009) evaluated operations of
6 increased water storage, a new Delta intake structure, and conveyance facilities. Although it was
7 determined that operations of the Los Vaqueros Reservoir Expansion Project would generate traffic,
8 stationary source, and area source noise, the noise would be similar to existing noise levels and would not
9 exceed local standards. The lead agency found that operations would have less-than-significant impacts
10 on sensitive receptors. The lead agency made a similar finding for the Calaveras Dam Replacement
11 Project. The distinction between these two projects is that operational noise of Calaveras Dam operations
12 is attenuated before it reaches sensitive receptors. Neither project requires mitigation.

13 As described in Section 15.5.3.1.1, additional documents reviewed for potential impacts of water supply
14 reliability projects other than surface water projects include EIRs for the Davis-Woodland Water Supply
15 Project (City of Davis 2007), Huntington Beach Seawater Desalination Project (City of Huntington Beach
16 2010), Carlsbad Precise Development Plan and Desalination Plant Project (City of Carlsbad 2005), and
17 Western Municipal Water District Riverside-Corona Feeder Pipeline Project (WMWD and Reclamation
18 2011).

19 The City of Davis found that the diversion/intake structure and wastewater treatment facility would have
20 less-than-significant operational noise impacts but potentially significant operational noise impacts from
21 groundwater pumps and emergency generators. It determined that with the implementation of mitigation,
22 operational noise of these features could be reduced to less-than-significant levels. The City of
23 Huntington Beach found that operation of pumps at the desalination facilities could exceed the city's
24 noise ordinance standard for nighttime noise levels. The city determined that this potentially significant
25 impact could be reduced to less than significant through the implementation of mitigation. The City of
26 Carlsbad found no significant operations-related impacts. Western Municipal Water District, like the City
27 of Huntington Beach, found the operation of pumps to be potentially significant and required mitigation
28 measures to reduce the operational noise levels to less than significant. Other water supply projects that
29 include the development of hydroelectric generation facilities would emit noise from electric power
30 generators and discharges to downstream waters, similar to water released for other purposes. For
31 purposes of this analysis, hydroelectric generation facilities would not emit noise substantially different
32 from the other water supply facilities previously noted.

33 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
34 time such projects are proposed by lead agencies. However, because of the potential for sensitive
35 receptors in the vicinity of related operations (e.g., operation of pumps at an intake facility) to experience
36 exposure to long-term noise increases exceeding recommended thresholds, the potential impacts are
37 considered **significant**.

38 *15.5.3.2 Delta Ecosystem Restoration*

39 As described in Sections 2A, Proposed Project and Alternatives, and 2B, Introduction to Resource
40 Sections, the Delta Plan does not direct the construction of specific projects, nor would projects be
41 implemented under the direct authority of the Delta Stewardship Council. However, the Delta Plan seeks
42 to improve the Delta ecosystem by encouraging various actions and projects that, if taken, could lead to
43 completion, construction, and/or operation of projects that could improve the Delta ecosystem.

1 Features of such actions and projects that could be implemented as part of efforts to restore the Delta
2 ecosystem include the following:

- 3 " Floodplain restoration
- 4 " Riparian restoration
- 5 " Tidal marsh restoration
- 6 " Ecosystem stressor management (e.g., continuation of ongoing programs managing pesticide
7 runoff, water quality, water flows)
- 8 " Invasive species management (including removal of invasive vegetation)

9 The number and location of all potential projects that would be implemented are not known at this time.
10 The following restoration areas, projects, and programs, however, are known to varying degrees and are
11 named in the Delta Plan:

- 12 " Cosumnes River-Mokelumne River Confluence: North Delta Flood Control and Ecosystem
13 Restoration Project
- 14 " Suisun Marsh Habitat Management, Preservation, and Restoration Plan (includes Hill Slough
15 Restoration Project)
- 16 " Cache Slough Complex (includes Prospect Island Restoration Project)
- 17 " Yolo Bypass
- 18 " Lower San Joaquin River Bypass Proposal
- 19 " Water Quality Control Plan Update for the San Francisco Bay/Sacramento–San Joaquin Delta
20 Estuary (water flow objectives update)
- 21 " Delta Conservancy Strategic Plan
- 22 " Variance of the U.S. Army Corps of Engineers' (USACE's) Vegetation Policy
- 23 " California Department of Fish and Game's (DFG's) Stage Two Actions for Nonnative Invasive
24 Species included in the Ecosystem Restoration Plan for the Sacramento-San Joaquin Bay Delta

25 Of these, the North Delta Flood Control and Ecosystem Restoration Project (North Delta Flood Control
26 and Ecosystem Restoration Project EIR) (DWR 2010) and the Suisun Marsh project (Suisun Marsh
27 Habitat Management, Preservation, and Restoration Plan Draft EIS/EIR) (Reclamation et al. 2010) have
28 undergone project-specific environmental review.

29 15.5.3.2.1 Impact 15-1b: Exposure of Sensitive Receptors to Excessive Temporary, Short-term 30 Construction Noise

31 Construction-related activities at construction sites for ecosystem restoration (operable barriers; channel
32 dredging; floodplain, riparian, and wetlands restoration; and levee modification and associated
33 infrastructure) could require the use of heavy equipment, such as excavators, graders, scrapers,
34 bulldozers, backhoes, pile drivers, barges, and dredges. Depending on the type and model of equipment
35 used for construction, noise levels would range from 80 to 85 L_{max} dBA at a distance of 50 feet (FHWA
36 2006). Haul trucks that would be used to move borrow and spoils and other materials could generate up to
37 88 L_{max} dBA at 50 feet. The facilities could be located in the Delta, in the Delta watershed, or in areas
38 outside the Delta that use Delta water, as described in Section 2A, Proposed Project and Alternatives.

1 Construction of the types of ecosystem restoration projects listed in Section 15.5.3.2 could expose
2 sensitive receptors in the vicinity of the construction and haul corridors to noise levels exceeding
3 applicable local standards. Actual exposure levels would depend on the intensity of the construction
4 activity and the distance of sensitive receptors to the noise source. In the Delta, sensitive receptors that
5 could be exposed include residents of cities and communities listed in the discussion of reliable water
6 supply actions (Section 15.5.3.1.1).

7 It is not known at this time exactly what types or where construction of specific restoration projects that
8 could expose sensitive receptors to excessive construction noise would occur. However, the Delta Plan
9 encourages and/or mentions implementation of the nine projects listed in Section 15.5.3.2. There are
10 ongoing projects that are similar to these restoration projects, the environmental evaluation of which
11 would be comparable to some of the actions/activities that would be expected with the encouraged
12 projects. These ongoing projects include the Suisun Marsh Habitat Management, Preservation, and
13 Restoration Plan (a project named in the Delta Plan) and North Delta Flood Control and Ecosystem
14 Restoration Project.

15 The Suisun Marsh Management, Preservation, and Restoration Plan EIS/EIR (Reclamation et al. 2010)
16 evaluated three alternatives to restore marsh habitat and create managed wetlands in Suisun Marsh. The
17 lead agency found that because of the distance of the sensitive noise receptors from construction,
18 construction-related noise impacts would be less than significant and required no mitigation for
19 construction.

20 The North Delta Flood Control and Ecosystem Restoration Project (DWR 2010) involves more
21 construction activities than the Suisun Marsh Management, Preservation, and Restoration Plan. The types
22 of equipment that would be used in these projects include dredges, pile drivers, derrick cranes, scrapers,
23 graders, and tugboats among others. DWR found that construction-related noise from general
24 construction, material hauling, and dredging would be significant. Mitigation measures were feasible and
25 reduced construction noise impacts to sensitive receptors to less-than-significant levels.

26 Generally, construction-related noise impacts for ecosystem restoration projects would be less than
27 construction-related noise impacts of reliable water supply-type actions, given the generally remote
28 distance of ecosystem projects from noise-sensitive land uses in the Delta, Delta watershed, or areas
29 outside the Delta that use Delta water. While construction-related noise impacts are expected to be similar
30 to these two examples, the specific location of sensitive noise receptors and the types of equipment are
31 not known at this time. Therefore, construction-related noise impacts on sensitive receptors cannot be
32 accurately determined, and it is uncertain whether feasible mitigation measures would be available for
33 implementation.

34 Project-level noise impacts related to ecosystem project construction would be addressed in future site-
35 specific environmental analysis conducted at the time such projects are proposed by lead agencies.
36 However, because of the potential for residents in the vicinity of related construction activities
37 (e.g., degradation of levees for floodplain restoration) to experience exposure to noise exceeding
38 applicable local standards, the potential impacts are considered **significant**.

39 15.5.3.2.2 Impact 15-2b: Temporary and Short-term Exposure of Sensitive Receptors to Excessive 40 Groundborne Vibrations

41 Construction-related activities at construction sites for floodplain, riparian, and wetlands restoration,
42 invasive species management, and levee modifications would require the use of the same types of heavy
43 equipment listed in the discussion of reliable water supply and the construction noise impacts of
44 ecosystem restoration actions. These types of equipment could generate groundborne vibrations
45 ranging from 0.035 to 1.518 in/sec PPV at a distance of 5 feet, with the range representing the

1 maximum amplitude and frequency of vibration waves that could be caused by these types of equipment
2 (FTA 2006).

3 Construction of the projects encouraged by the Delta Plan could expose sensitive receptors in the vicinity
4 of the construction and haul corridors to excessive groundborne vibrations. Actual exposure levels would
5 depend on the intensity of the construction activity and the distance of sensitive receptors to the vibration
6 source. In the Delta, sensitive receptors that could be exposed include fragile, historic, and older
7 structures as described in the reliable water supply discussion.

8 It is not known at this time what types or where construction of specific restoration projects that could
9 expose sensitive receptors to excessive groundborne vibrations would occur. However, the Delta Plan
10 encourages and/or mentions implementation of the nine projects listed in Section 15.5.3.2. One of these—
11 the Suisun Marsh Habitat Management, Preservation, and Restoration Plan—has undergone project-level
12 environmental review the results of which are analogous to the other projects above and of the general
13 ecosystem project elements listed in Section 15.5.3.2. Another project—the North Delta Flood Control
14 and Ecosystem Restoration Project—a project named in the Delta Plan, also is similar to the other
15 projects above and the general ecosystem project elements listed in Section 15.5.3.2; it underwent project-
16 level environmental review, the results of which also are analogous to the other projects above and of the
17 general ecosystem project elements listed in Section 15.5.3.2.

18 The North Delta Flood Control and Ecosystem Restoration Project (DWR 2010) involves more
19 construction activities than the Suisun Marsh Management, Preservation, and Restoration Plan. The types
20 of equipment that would be used in these projects include pile drivers, derrick cranes, scrapers, and
21 graders among others. The lead agencies for both projects found that groundborne vibrations would be
22 less than significant. Mitigation measures were not required. While groundborne vibrations are expected
23 to be similar to these two examples, the specific location of sensitive receptors and the types of equipment
24 are not known at this time. Therefore, groundborne vibration impacts on sensitive receptors cannot be
25 accurately determined, and it is uncertain whether feasible mitigation measures would be available for
26 implementation.

27 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
28 time such projects are proposed by lead agencies. However, because of the potential for sensitive
29 receptors in the vicinity of related construction activities (e.g., pile driving used for the installation of
30 coffer dams in tidal marsh restoration) to experience exposure to vibrations exceeding applicable local
31 standards, the potential impacts are considered **significant**.

32 15.5.3.2.3 Impact 15-3b: Long-term Exposure of Sensitive Receptors to Excessive Noise from 33 Operations

34 Few actions under ecosystem restoration (operations of restored floodplains, riparian, and wetlands
35 habitats, ongoing invasive species management, and levee maintenance) would create long-term noise.
36 Maintenance of new or modified facilities could increase long-term noise levels, but these maintenance
37 activities would not be continuous but punctuated by time intervals of days, weeks, months, or years.
38 Maintenance and other related activities would be required to comply with applicable maintenance
39 standards, reducing effects on the noise environment.

40 For example, the Suisun Marsh Management, Preservation, and Restoration Plan EIS/EIR (Reclamation
41 et al. 2010) evaluated the use of pumping to manage the integration of floodplains and restored wetlands.
42 No significant noise impact from operations was found and no mitigation measures were required.

43 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
44 time such projects are proposed by lead agencies. However, because the long-term noise effects from
45 pumps operating for floodplain management would be expected to be limited and periodic, this potential
46 impact would be **less than significant** and no mitigation is required.

1 **15.5.3.3 Water Quality Improvement**

2 As described in Sections 2A, Proposed Project and Alternatives, and 2B, Introduction to Resource
3 Sections, the Delta Plan does not direct the construction of specific projects, nor would projects be
4 implemented under the direct authority of the Delta Stewardship Council. However, the Delta Plan seeks
5 to improve water quality by encouraging various actions and projects that, if taken, could lead to
6 completion, construction, and/or operation of projects that could improve water quality.

7 Features of such actions and projects that could be implemented as part of efforts to improve water
8 quality include the following:

- 9 " Water treatment plants
- 10 " Conveyance facilities (pipelines, pumping plants)
- 11 " Wastewater treatment and recycle facilities
- 12 " Municipal stormwater treatment facilities
- 13 " Agricultural runoff treatment (eliminate, capture and treat/reuse)
- 14 " Wellhead treatment facilities
- 15 " Wells (withdrawal, recharge, and monitoring)

16 The number and location of all potential actions and projects that would be implemented are not known at
17 this time. Various projects, however, are known to varying degrees and are named in the Delta Plan:

- 18 " North Bay Aqueduct Alternative Intake Project
- 19 " Central Valley Drinking Water Policy
- 20 " Central Valley Pesticide Total Maximum Daily Load and Basin Plan Amendment for diazinon
21 and chlorpyrifos (regulatory processes, research, and monitoring)
- 22 " Central Valley Pesticide Total Maximum Daily Load and Basin Plan Amendment for pyrethroids
23 (regulatory processes, research, and monitoring)
- 24 " Total Maximum Daily Load and Basin Plan Amendments for selenium and methylmercury
25 (regulatory processes, research, and monitoring)
- 26 " Water Quality Control Plan Update for the San Francisco Bay/Sacramento–San Joaquin Delta
27 Estuary (water flow objectives update)
- 28 " State Water Resources Control Board/Central Valley Regional Water Quality Control Board
29 Strategic Workplan
- 30 " Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS)

31 Of these named projects/actions, only the North Bay Aqueduct Project and the CV-SALTS effort would
32 involve construction and/or operation of facilities that could have noise and/or vibration impacts. The
33 remaining six are programs, policies, or studies that would not result in a specific project, the construction
34 or operation of which, could generate noise; therefore, these programs, policies, and studies are not
35 evaluated in this section.

36 **15.5.3.3.1 Impact 15-1c: Exposure of Sensitive Receptors to Excessive Temporary, Short-term** 37 **Construction Noise**

38 Construction-related activities for the types of water quality improvement actions/projects listed in
39 Section 15.5.3.3 are similar to the construction-related activities listed for reliable water supply actions
40 (Section 15.5.3.1). Water quality projects would include construction of water treatment plants, pipelines,
41 wastewater reclamation facilities, stormwater treatment facilities, and facilities for treating agricultural

1 runoff. The range of noise levels for heavy equipment would be the same as was described for reliable
2 water supply and ecosystem restoration projects (80 to 85 L_{\max} dBA at 50 feet). Haul trucks that would be
3 used to move borrow and spoils and other materials could generate up to 88 L_{\max} dBA at 50 feet. The
4 facilities could be located in the Delta, Delta watershed, and in areas outside the Delta that use Delta
5 water, as described in Section 2A, Proposed Project and Alternatives.

6 Construction of the projects encouraged by the Delta Plan also could expose sensitive receptors in the
7 vicinity of the construction and haul corridors to noise levels exceeding applicable local standards. Actual
8 exposure levels would depend on the intensity of the construction activity and the distance of sensitive
9 receptors to the noise source. As with the categories of actions already discussed, it is unclear at this time
10 how implementation of the Proposed Project would result in all construction activities, including the
11 location, number, methods, and duration of construction and which projects would get constructed.

12 The Delta Plan encourages implementation of the North Bay Aqueduct Alternative Intake Project and the
13 Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) effort. CV-SALTS
14 would result in the construction of new wastewater treatment facilities. The new North Bay Alternative
15 Intake Structure serves the purpose of meeting CV-SALTS and water discharge requirements. The new
16 alternative intake structure would be located on the Sacramento River in a rural area of Sacramento or
17 Yolo County and the new pipeline would extend from the new intake structure to the existing North Bay
18 Regional Water Treatment Plant. The diversion/intake structure and water conveyance pipeline are
19 similar to those associated with the Davis-Woodland Water Supply Project, which while not named in the
20 Delta Plan nevertheless provides analogous information.

21 The Davis-Woodland Water Supply Project EIR (City of Davis 2007) found that the project could, for the
22 most part, mitigate potentially significant construction noise. However, it was determined that it was not
23 feasible to preclude nighttime construction of the new water intake structure. Therefore, construction of
24 the project would cause sensitive noise receptors to be exposed noise exceeding the city's nighttime noise
25 standard.

26 Another document reviewed for potential impacts is the Grassland Bypass Project EIS/EIR (Reclamation
27 and San Luis & Delta-Mendota Water Authority 2008). This document found that the temporary
28 construction noise impacts on sensitive receptors were less than significant.

29 However, the specific details of named projects and projects encouraged by the Delta Plan
30 (Section 15.5.3.3) and the specific locations of sensitive noise receptors and the specific types of
31 equipment to be used are not known at this time. Therefore, construction-related noise impacts on
32 sensitive receptors from water quality improvement projects cannot be accurately determined, and it is
33 uncertain whether feasible mitigation measures would be available for implementation.

34 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
35 time such projects are proposed by lead agencies. However, because of the potential for residents in the
36 vicinity of related construction activities (e.g., construction of water treatment plants near urban areas) to
37 experience exposure to noise exceeding applicable local standards, the potential impacts are considered
38 **significant**.

39 15.5.3.3.2 Impact 15-2c: Temporary and Short-term Exposure of Sensitive Receptors to Excessive 40 Groundborne Vibrations

41 Construction-related activities for water quality improvement are similar to the construction-related
42 activities listed for reliable water supply actions (Section 15.5.3.1). Water quality projects would include
43 construction of water treatment plants, pipelines, wastewater reclamation facilities, stormwater treatment
44 facilities, and facilities for treating agricultural runoff. The range of groundborne vibration levels for
45 heavy equipment would be the same as was described for reliable water supply and ecosystem restoration
46 projects (0.035 to 1.518 in/sec PPV at 25 feet).

1 Construction of the projects encouraged by the Delta Plan also could expose sensitive receptors in the
2 vicinity of the construction and haul corridors to excessive groundborne vibrations. Actual exposure
3 levels would depend on the intensity of the construction activity and the distance of sensitive receptors to
4 the noise source.

5 As with the categories of actions already discussed, it is unclear at this time how implementation of the
6 Proposed Project would result in specific construction activities, including the location, number, methods,
7 and duration. The Delta Plan encourages implementation of the North Bay Aqueduct Alternative Intake
8 Project and the CV-SALTS effort. CV-SALTS would result in the construction of new wastewater
9 treatment facilities. The new North Bay Alternative Intake Structure serves the purpose of meeting
10 CV-SALTS and water discharge requirements. The new alternative intake structure would be located on
11 the Sacramento River in a rural area of Sacramento or Yolo County and the new pipeline would extend
12 from the new intake structure to the existing North Bay Regional Water Treatment Plant. The
13 diversion/intake structure and water conveyance pipeline are similar to those associated with the
14 Davis-Woodland Water Supply Project, which while not named in the Delta Plan nevertheless provides
15 analogous information.

16 The Davis-Woodland Water Supply Project EIR (City of Davis 2007) found that the groundborne
17 vibrations generated during construction of the Davis-Woodland Water Supply Project would be less than
18 significant. No mitigation measures are needed. Another document reviewed for potential impacts is the
19 EIR/EIS for the Grassland Bypass Project (Reclamation and San Luis & Delta-Mendota Water Authority
20 2008). This document found that construction-related vibration impacts would be less than significant.
21 Although the details of many of the aspects of named projects and projects encouraged by the Delta Plan
22 area not known, based on these examples, it is likely that the vibration impacts of water quality
23 improvement projects encouraged by the Delta Plan would be less than significant.

24 However, the specific details of named projects and projects encouraged by the Delta Plan
25 (Section 15.5.3.3) and the specific location of sensitive noise receptors and the types of equipment to be
26 used are not known at this time. Therefore, groundborne-vibration impacts on sensitive receptors cannot
27 be accurately determined or if feasible mitigation measures are available for implementation.

28 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
29 time such projects are proposed by lead agencies. However, because of the potential for sensitive
30 receptors in the vicinity of related construction activities (e.g., pile driving needed for the construction of
31 water treatment plants) to experience exposure to groundborne vibration levels exceeding recommended
32 thresholds, the potential impacts are considered **significant**.

33 15.5.3.3.3 Impact 15-3c: Long-term Exposure of Sensitive Receptors to Excessive Noise from 34 Operations

35 Operations-related activities for water quality improvement are similar to the operations-related activities
36 listed for reliable water supply actions (Section 15.5.3.1.3). Water quality projects would include the
37 operation of water treatment plants, pipelines, wastewater reclamation facilities, stormwater treatment
38 facilities, and facilities for treating agricultural runoff.

39 It is unclear at this time how implementation of the Proposed Project would create noise related to
40 operations of new water quality facilities because the location, number, design, and other details of the
41 facilities are not currently known.

42 The Delta Plan, however, encourages implementation of the North Bay Aqueduct Alternative Intake
43 Project and the CV-SALTS effort. CV-SALTS would result in the operation of new wastewater treatment
44 facilities. The new North Bay Alternative Intake Structure serves the purpose of meeting CV-SALTS and
45 water discharge requirements. The diversion/intake structure and water conveyance pipeline for this
46 project are similar to those associated with the Davis-Woodland Water Supply Project, which while not

1 named in the Delta Plan does provide analogous information and has undergone project-specific
2 environmental review. The Davis-Woodland Project also includes a water treatment plant component.

3 The Davis-Woodland Water Supply Project EIR (City of Davis 2007) found that the diversion/intake
4 structure and wastewater treatment facility would have less-than-significant operational noise impacts, but
5 potentially significant operational noise impacts from groundwater pumps and emergency generators. It
6 determined that with the implementation of mitigation, operational noise of these features could be
7 reduced to less-than-significant levels.

8 Another document reviewed for potential impacts is the EIR/EIS for the Grassland Bypass Project
9 (Reclamation and San Luis & Delta-Mendota Water Authority 2008). This document found that noise
10 impacts from project operations would be less than significant because it would authorize the ongoing use
11 of the San Joaquin River Water Quality Improvement Project; therefore, there would be no significant
12 change in the existing noise environment.

13 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
14 time such projects are proposed by lead agencies. However, because of the potential for sensitive
15 receptors in the vicinity of related operations (e.g., operation of pumping facilities associated with
16 conveyance systems) to experience exposure to long-term noise increases exceeding recommended
17 thresholds, the potential impacts are considered **significant**.

18 **15.5.3.4 Flood Risk Reduction**

19 As described in Sections 2A, Proposed Project and Alternatives, and 2B, Introduction to Resource
20 Sections, the Delta Plan does not direct the construction of specific projects, nor would projects be
21 implemented under the direct authority of the Delta Stewardship Council. However, the Delta Plan seeks
22 to reduce the risk of floods in the Delta by encouraging various actions that, if taken, could lead to
23 completion, construction, and/or operation of projects that could reduce flood risks in the Delta. Such
24 projects and their features could include the following:

- 25 " Setback levees
- 26 " Floodplain expansion
- 27 " Levee maintenance
- 28 " Levee modification
- 29 " Dredging
- 30 " Stockpiling of rock for flood emergencies
- 31 " Subsidence reversal
- 32 " Reservoir reoperation

33 The number and location of all potential projects that would be implemented are not known at this time.
34 Two possible projects, however, are known to some degree and are named in the Delta Plan: the
35 Sacramento Deep Water Ship Channel and Stockton Deep Water Ship Channel Dredging (the United
36 States Army Corps of Engineer's Delta Dredged Sediment Long-Term Management Strategy included in
37 Appendix C, Attachment C-7 of this EIR) and DWR's A Framework for Department of Water Resources
38 Investments in Delta Integrated Flood Management. There is no project-specific environmental evaluation
39 of the Sacramento Deep Water Ship Channel and Stockton Deep Water Ship Channel Maintenance
40 Project. The DWR framework is a program, not an activity that would generate noise; therefore, it is not
41 evaluated in this section.

42 **15.5.3.4.1 Impact 15-1d: Exposure of Sensitive Receptors to Excessive Temporary, Short-term** 43 **Construction Noise**

44 Construction-related activities would require the use of the same types of heavy equipment listed in
45 the discussion of water supply reliability (Section 15.5.3.1.1) and ecosystem restoration

1 (Section 15.5.3.2.1) actions. Noise levels would range from 80 to 85 L_{\max} dBA at 50 feet (FHWA 2006).
2 Haul trucks would generate up to 88 L_{\max} dBA at a distance of 50 feet. The facilities could be located in
3 the Delta, Delta watershed, or in areas outside the Delta that use Delta water, as described in Section 2A,
4 Proposed Project and Alternatives, although they would be located primarily in the Delta.

5 Construction of the projects encouraged by the Delta Plan could expose sensitive receptors in the vicinity
6 of the construction and haul corridors to noise levels exceeding applicable local standards. Actual
7 exposure levels would depend on the intensity of the construction activity and the distance of sensitive
8 receptors to the noise source. In the Delta, sensitive receptors that could be exposed include residents of
9 cities and communities listed in the discussion of reliable water supply actions. As noted previously,
10 applicable noise standards for construction in the Delta would be those specified in county or city
11 ordinances or general plans.

12 It is not known at this time what types or where construction of specific flood risk reduction projects that
13 could expose sensitive receptors to excessive construction noise would occur. However, in addition to
14 levee construction and levee repairs, the Delta Plan encourages implementation of dredging to reduce
15 flood risk, including such as would be involved in the Sacramento Deep Water Ship Channel and
16 Stockton Deep Water Ship Channel Dredging Project (which has not undergone project-specific
17 environmental review). A project that involves similar hydraulic dredging, and levee construction actions
18 is the North Delta Flood Control and Ecosystem Restoration Project, which has undergone project-
19 specific environmental review (DWR 2010).

20 The North Delta Flood Control and Ecosystem Restoration Project was discussed in the ecosystem
21 restoration subsection (Section 15.5.3.2.1). DWR found that construction-related noise from general
22 construction, material hauling, and dredging would be significant. Mitigation measures were feasible and
23 with implementation would reduce construction-related noise impacts to sensitive receptors to less-than-
24 significant levels.

25 Other documents reviewed for potential impacts included the EIR for the Long-Term Management
26 Strategy for the Placement of Dredged Material in the San Francisco Bay Region Final Policy
27 (USACE et al. 1998) and the USACE Draft Supplemental EIS/EIR for the Sacramento River Deep Water
28 Ship Channel (USACE and Port of West Sacramento 2011). Both documents found that the construction-
29 related noise impacts on sensitive receptors would be less than significant with mitigation.

30 However, the specific details of named projects and projects encouraged by the Delta Plan
31 (Section 15.5.3.4) and the specific location of sensitive noise receptors and the types of equipment to be
32 used are not known at this time. Therefore, construction-related noise impacts on sensitive receptors from
33 flood risk reduction cannot be accurately determined, and it is uncertain whether feasible mitigation
34 measures would be available for implementation.

35 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
36 time specific flood risk reduction projects are proposed by lead agencies. However, because of the
37 potential for sensitive receptors to be located in the vicinity of construction activities (e.g., dredging) that
38 could cause noise that exceeds an applicable local standard, the potential impacts are considered
39 **significant**.

40 15.5.3.4.2 Impact 15-2d: Temporary and Short-term Exposure of Sensitive Receptors to Excessive 41 Groundborne Vibrations

42 Construction-related activities would require the use of the same types of heavy equipment listed in the
43 discussion of reliable water supply (Section 15.5.3.1) and ecosystem restoration actions
44 (Section 15.5.3.2). These types of equipment could generate groundborne vibrations ranging from
45 0.035 to 1.518 in/sec PPV at 25 feet, with the range representing the maximum amplitude and frequency
46 of vibration waves that could be caused by these types of equipment (FTA 2006).

1 Construction of the projects encouraged by the Delta Plan could expose sensitive receptors in the vicinity
2 of the construction and haul corridors to excessive groundborne vibrations. Actual exposure levels would
3 depend on the intensity of the construction activity and the distance of sensitive receptors to the noise
4 source. In the Delta, sensitive receptors that could be exposed include fragile, historic, and older
5 structures as described in the reliable water supply discussion.

6 Implementation of the Proposed Project could also expose sensitive receptors to groundborne vibrations
7 from increased construction to improve Delta levees compared to existing conditions. Most of the projects
8 encouraged by the Delta Plan would occur in rural areas, distant from urban areas and dense concen-
9 trations of sensitive receptors. However, some of these levee improvement projects could occur near the
10 cities of Lathrop, Stockton (southern sphere of influence), Elk Grove, West Sacramento, Isleton, Suisun
11 City, and Oakley, as well as unincorporated residential subdivisions in San Joaquin County (San Joaquin
12 River Club), Sacramento County (Ida Island), and Contra Costa County (Bethel Island).

13 As mentioned in the preceding impact discussion (Section 15.5.3.4.1), the North Delta Flood Control and
14 Ecosystem Restoration Project provides analogous information. DWR found in the North Delta Flood
15 Control and Ecosystem Restoration Project EIR that groundborne vibrations from general construction,
16 material hauling, and dredging would be less than significant (DWR 2010). No mitigation was required.

17 Other documents reviewed for potential impacts included the EIR for the Long-Term Management
18 Strategy for the Placement of Dredged Material in the San Francisco Bay Region Final Policy
19 (USACE et al. 1998) and the USACE Draft Supplemental EIS/EIR for the Sacramento River Deep Water
20 Ship Channel (USACE and Port of West Sacramento 2011). Both documents found that the vibration
21 impacts on sensitive receptors would be less than significant.

22 However, the specific details of named projects and projects encouraged by the Delta Plan
23 (Section 15.5.3.4) the specific location of sensitive vibration receptors and the types of equipment to be
24 used are not known at this time. Therefore, construction-related vibration impacts from flood risk
25 reduction cannot be accurately determined, and it is uncertain whether feasible mitigation measures would
26 be available for implementation.

27 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
28 time such projects are proposed by lead agencies. However, because of the potential for sensitive
29 receptors in the vicinity of related construction activities (e.g., stockpiling rock near a historic bridge) to
30 experience exposure to groundborne vibration levels exceeding recommended thresholds, the potential
31 impacts are considered **significant**.

32 15.5.3.4.3 Impact 15-3d: Long-term Exposure of Sensitive Receptors to Excessive Noise from 33 Operations

34 As with the ecosystem restoration category of projects (Section 15.5.3.2.3), few actions under flood risk
35 reduction would create long-term noise. Maintenance of new or modified facilities could increase long-
36 term noise levels, but these maintenance activities would not be continuous but punctuated by time
37 intervals of days, weeks, months, or years. Maintenance and other related activities would be required to
38 comply with applicable maintenance standards, reducing effects on the noise environment.

39 Documents reviewed for potential impacts included the EIR for the Long-Term Management Strategy for
40 the Placement of Dredged Material in the San Francisco Bay Region Final Policy (USACE et al. 1998),
41 North Delta Flood Control and Ecosystem Restoration Project EIR (DWR 2010), and USACE Draft
42 Supplemental EIS/EIR for the Sacramento River Deep Water Ship Channel (USACE and Port of West
43 Sacramento 2011). All found that the operations-related noise impacts on sensitive receptors would be
44 less than significant.

1 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
2 time such projects are proposed by lead agencies. However, because the long-term noise effects would be
3 expected to be limited and periodic, this potential impact would be **less than significant** and no
4 mitigation is required.

5 **15.5.3.5 Protection and Enhancement of Delta as an Evolving Place**

6 As described in Sections 2A, Proposed Project and Alternatives, and 2B, Introduction to Resource
7 Sections, the Delta Plan does not direct the construction of specific projects, nor would projects be
8 implemented under the direct authority of the Delta Stewardship Council. However, the Delta Plan seeks
9 to protect and enhance the Delta as an evolving place by encouraging various actions and projects that, if
10 taken, could lead to completion, construction, and/or operation of associated projects. Features of such
11 actions could include the following:

- 12 " Gateways, bike lanes, parks, trails, and marinas and facilities to support wildlife viewing, angling,
13 and hunting opportunities
- 14 " Additional retail and restaurants in legacy towns to support tourism

15 The number and location of all potential projects that would be implemented are not known at this time.
16 However, four possible projects are known to some degree and are named in the Delta Plan: new State
17 parks at Barker Slough, at Elkhorn Basin, and in the southern Delta and the Economic Sustainability Plan.
18 There are no project-specific environmental evaluations of the three State park projects. The Economic
19 Sustainability Plan is not an activity that would generate noise; therefore, it is not evaluated in this
20 section.

21 **15.5.3.5.1 Impact 15-1e: Exposure of Sensitive Receptors to Excessive Temporary, Short-term** 22 **Construction Noise**

23 Construction-related activities for the actions/projects listed in Section 15.5.3.5 would require the use of
24 heavy equipment. Noise levels would range from 80 to 85 L_{max} dBA at a distance of 50 feet (FHWA
25 2006). Haul trucks would generate up to 88 L_{max} dBA at a distance of 50 feet. The facilities would be
26 focused in the Delta.

27 Construction of the Delta enhancement projects encouraged by the Delta Plan could expose sensitive
28 receptors in the vicinity of the construction and haul corridors to noise levels exceeding applicable local
29 standards. Actual exposure levels would depend on the intensity of the construction activity and the
30 distance of sensitive receptors to the noise source. In the Delta, sensitive receptors that could be exposed
31 include residents of cities and communities listed in the discussion of reliable water supply actions.

32 It is not known at this time what types or where construction of specific Delta as evolving place type
33 projects that could expose sensitive receptors to excessive construction noise would occur. However, the
34 Delta Plan encourages implementation of State parks at Barker Slough, at Elkhorn Basin, and in the
35 southern Delta, none of which have undergone project-specific environmental review. There are ongoing
36 projects that are similar to these park projects and that would be comparable to the general types of Delta-
37 enhancing projects listed above. These ongoing projects have undergone project-specific environmental
38 review in the Bidwell-Sacramento River State Park Habitat Restoration and Outdoor Recreation Facilities
39 Development Project EIR (The Nature Conservancy and California Department of Parks and Recreation
40 2008) and San Luis Rey River Park Master Plan EIR (San Diego County Department of Parks and
41 Recreation 2008). In both cases, the lead agency found that because of the distance of the sensitive noise
42 receptors from construction and with the implementation of mitigation measures, construction-related
43 noise impacts would be less than significant.

44 Generally, construction-related noise impacts would be less than construction-related noise impacts of
45 reliable water supply-type actions, given the remote proximity of construction activities to noise-sensitive

1 land uses in the Delta. The specific location of sensitive noise receptors and the types of equipment are
2 not known at this time. Therefore, construction-related noise impacts on sensitive receptors cannot be
3 accurately determined, and it is uncertain whether feasible mitigation measures would be available for
4 implementation—for example, if sensitive land uses are located close to a construction site and
5 construction equipment would require the use of backup warning systems that would exceed a local noise
6 ordinance.

7 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
8 time such projects are proposed by lead agencies. However, because of the potential for residents in the
9 vicinity of related construction activities (e.g., construction of new retail businesses in a legacy town) to
10 experience exposure to noise exceeding applicable local standards, the potential impacts are considered
11 **significant**.

12 15.5.3.5.2 Impact 15-2e: Temporary and Short-term Exposure of Sensitive Receptors to Excessive 13 Groundborne Vibrations

14 Construction-related activities for the actions/projects listed in Section 15.5.3.5 would require the use of
15 heavy equipment. These types of equipment could generate groundborne vibrations ranging from 0.035 to
16 1.518 in/sec PPV at a distance of 25 feet, with the range representing the maximum amplitude and
17 frequency of vibration waves that could be caused by these types of equipment (FTA 2006).

18 Construction of the projects encouraged by the Delta Plan could expose sensitive receptors in the vicinity
19 of the construction and haul corridors to excessive groundborne vibrations. Actual exposure levels would
20 depend on the intensity of the construction activity and the distance of sensitive receptors to the source of
21 vibrations. In the Delta, sensitive receptors that could be exposed include fragile, historic, and older
22 structures as described in the reliable water supply discussion (Section 15.5.3.1.3).

23 It is not known at this time what types or where construction of specific Delta enhancement projects that
24 could expose sensitive receptors to excessive groundborne vibrations would occur. However, the Delta
25 Plan encourages implementation of State parks at Barker Slough, at Elkhorn Basin, and in the southern
26 Delta. As mentioned above, the Bidwell-Sacramento River State Park Habitat Restoration and Outdoor
27 Recreation Facilities Development Project EIR (The Nature Conservancy and California Department of
28 Parks and Recreation 2008) and San Luis Rey River Park Master Plan EIR (San Diego County
29 Department of Parks and Recreation 2008) provide analogous information. In both cases, the lead agency
30 found that because of the distance of the sensitive noise receptors from construction that groundborne
31 vibration impacts would be less than significant.

32 However, the specific details of named projects and projects encouraged by the Delta Plan
33 (Section 15.5.3.5), the specific location of sensitive vibration receptors, and the types of equipment to be
34 used are not known at this time. Therefore, construction-related vibration impacts from Delta
35 enhancements cannot be accurately determined, and it is uncertain whether feasible mitigation measures
36 would be available for implementation.

37 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
38 time such projects are proposed by lead agencies. However, because of the potential for sensitive
39 receptors in the vicinity of related construction activities (e.g., pile driving associated with a new marina)
40 to experience exposure to groundborne vibration levels exceeding recommended thresholds, the potential
41 impacts are considered **significant**.

42 15.5.3.5.3 Impact 15-3e: Long-term Exposure of Sensitive Receptors to Excessive Noise from 43 Operations

44 Operation of Delta enhancement projects (gateways, bike lanes, trails, parks, marinas, retail/restaurants,
45 and other facilities) has the potential to introduce long-term noise, depending on the type of facility

1 proposed and the amount of increased use. The types of facilities that could result in significant long-term
2 operational noise impacts include dog parks, playing fields, parking lots (including bus loading and
3 unloading zones), marinas, restaurants with outdoor seating areas, and boat ramps.

4 It is not known at this time what types or where specific projects that could expose sensitive receptors to
5 excessive operations noise would occur. However, the Delta Plan encourages implementation of State
6 parks at Barker Slough, at Elkhorn Basin, and in the southern Delta. As mentioned above, the Bidwell-
7 Sacramento River State Park Habitat Restoration and Outdoor Recreation Facilities Development Project
8 EIR (The Nature Conservancy and California Department of Parks and Recreation 2008) and San Luis
9 Rey River Park Master Plan EIR (San Diego County Department of Parks and Recreation 2008) provide
10 analogous information

11 The lead agency found Bidwell-Sacramento River State Park Habitat Restoration and Outdoor Recreation
12 Facilities Development Project would have less than significant operational noise impacts because of the
13 distance of the sensitive noise receptors from the site. San Luis Rey River Park (San Diego County
14 Department of Parks and Recreation 2008), on the other hand found that certain proposed uses could be
15 located in proximity to sensitive receptors such that they would be exposed to excessive noise from
16 operations. The lead agency determined that feasible mitigation measures would reduce potential
17 operational noise impacts to a less-than-significant level.

18 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
19 time such projects are proposed by lead agencies. However, because of the potential for sensitive
20 receptors in the vicinity of related facilities to experience exposure to excessive long-term noise levels
21 exceeding recommended thresholds (e.g., noise generated by new traffic associated with new restaurant
22 uses in Delta legacy towns), the potential impacts are considered **significant**.

23 ***15.5.3.6 Mitigation Measures***

24 Any covered action that would have one or more of the significant environmental impacts listed above
25 shall incorporate the following features and/or requirements related to such impacts (e.g., construction
26 noise mitigation for construction noise impacts).

27 With regard to covered actions implemented under the Delta Plan, these mitigation measures will reduce
28 the impacts of the Proposed Project. Project-level analysis by the agency proposing the covered action
29 will determine whether the measures are sufficient to reduce those impacts to a less-than-significant level.
30 Generally speaking, many of these measures are commonly employed to minimize the severity of an
31 impact and in many cases would reduce impacts to a less-than-significant level, as discussed below in
32 more detail.

33 With regard to actions taken by other agencies on the basis of Delta Plan recommendations (i.e., activities
34 that are not covered actions), the implementation and enforcement of these measures would be within the
35 responsibility and jurisdiction of public agencies other than the Delta Stewardship Council. Those
36 agencies can and should adopt these measures as part of their approval of such actions, but the Delta
37 Stewardship Council does not have the authority to require their adoption. Therefore, significant impacts
38 of noncovered actions could remain **significant and unavoidable**.

39 How mitigation measures in this EIR relate to covered and noncovered actions is discussed in more detail
40 in Section 2B, Introduction to Resource Sections.

1 15.5.3.6.1 Mitigation Measure 15-1

2 The following mitigation measures would reduce the effects of Impact 15-1a through e, Exposure of
3 Sensitive Receptors to Excessive Temporary, Short-Term Noise:

4 " Limit the hours of operation at noise-generation sources located near or adjacent to
5 noise-sensitive areas, wherever practicable, to reduce the level of exposure to meet applicable
6 local standards.

7 " Locate construction equipment away from sensitive receptors, to the extent feasible, to reduce
8 noise levels below applicable local standards.

9 " Maintain construction equipment to manufacturers' recommended specifications, and equip all
10 construction vehicles and equipment with appropriate mufflers and other approved noise-control
11 devices.

12 " Limit idling of construction equipment to the extent feasible to reduce the time that noise is
13 emitted.

14 " Conduct individual traffic noise analysis of identified haul routes and provide mitigation, such as
15 reduced speed limits, at locations where noise standards cannot be maintained for sensitive
16 receptors.

17 " Incorporate use of temporary noise barriers, such as acoustical panel systems, between
18 construction activities and sensitive receptors if it is concluded that they would be effective in
19 reducing noise exposure to sensitive receptors.

20 " Near sensitive receptors, avoid or minimize use of construction equipment known to generate
21 high levels of groundborne vibration (for example, pile drivers).

22 These mitigation measures are commonly employed on a variety of construction projects. In many cases,
23 they reduce significant construction-related noise impacts to less-than-significant levels. Implementation
24 of these mitigation measures would reduce the significance of construction-related noise impacts by
25 limiting construction noise-generating activities to hours when sensitive receptors would not be home or
26 not trying to sleep, locating construction noise-generating activities at a distance sufficient from sensitive
27 receptors for noise to attenuate before reaching the sensitive receptor, operating equipment that generates
28 less noise than equipment that is not well maintained, limiting the duration of noise emissions, and using
29 noise barriers to attenuate noise before it reaches sensitive receptors when construction cannot be moved
30 away from sensitive receptors. In cases when 24-hour construction is required, it is not feasible to relocate
31 construction activities away from sensitive receptors, or noise barriers are not adequate to attenuate noise,
32 construction-related noise impacts would remain **significant**.

33 15.5.3.6.2 Mitigation Measure 15-2

34 The following mitigation measures would reduce the effects of Impact 15-2a through e, Temporary and
35 Short-term Exposure of Sensitive Receptors to Excessive Groundborne Vibrations:

36 " Conduct a preliminary groundborne vibration analysis report to determine future construction-
37 related groundborne vibration levels based on, but not limited to, a detailed equipment list, hours
38 of operation and distances to sensitive receptors located within 500 feet of project sites.

39 " Provided that future groundborne vibration results in significant impacts at sensitive receptors,
40 the following measures shall be implemented:

41 · Designate a complaint coordinator and post this person's contact information in a location
42 near construction areas where it is clearly visible to the nearby receptors most likely to be

- 1 affected. The coordinator will manage complaints and concerns resulting from activities that
2 cause vibrations. The severity of the vibration concern should be assessed by the coordinator
3 and, if necessary, evaluated by a qualified noise and vibration control expert.
- 4 · Vibration monitoring will be conducted before and during vibration generating operations
5 occurring within 100 feet of historic structures. Every attempt will be made to limit
6 construction-generated vibration levels during pile driving and other groundborne noise and
7 vibration-generating activities in the vicinity of the historic structures in accordance with
8 recommendations of the appropriate agency with authority.
 - 9 · Adjacent historic features will be covered or temporarily shored, as necessary, for protection
10 from vibrations, in consultation with the appropriate cultural resources authority.
 - 11 · Pile driving required within a 50-foot radius of residences will use alternative installation
12 methods where possible (e.g., pile cushioning, jetting, predrilling, cast-in-place systems,
13 resonance-free vibratory pile drivers). This would reduce the number and amplitude of blows
14 required to seat the pile.
 - 15 · Pile-driving activities conducted within 285 feet of sensitive receptors will occur during
16 daytime hours to avoid sleep disturbance during evening and nighttime hours.

17 These mitigation measures are commonly employed on a variety of construction projects. In many cases,
18 they reduce significant construction-related groundborne vibration impacts to less-than-significant levels.
19 Implementation of these mitigation measures would reduce the significance of construction-related
20 vibration impacts by determining whether receptors sensitive to groundborne vibrations (for example,
21 historic structures) are located near the construction activity and, if they are, relocating vibration-emitting
22 activities to a distance sufficient from sensitive receptors for vibrations to attenuate before reaching the
23 sensitive receptor, stopping vibration-generating construction if area residents complain of vibration
24 nuisance, and using alternate construction techniques to completely avoid the generation of groundborne
25 vibrations. In cases when it is not feasible to relocate construction activities away from sensitive
26 receptors, if it is not feasible to stop vibration-generating construction activities after construction has
27 commenced, or alternate construction techniques would cause a project to not be constructed because of
28 severe additional cost relative to the overall cost of the project, construction-related groundborne
29 vibration impacts would remain **significant**.

30 15.5.3.6.3 Mitigation Measure 15-3

31 The following mitigation measures would reduce the effects of Impact 15-3a through e, Long-term
32 Exposure of Sensitive Receptors to Excessive Noise from Operations:

- 33 · Identify noise-sensitive receptors in the vicinity of project activities and design projects to
34 minimize exposure of sensitive receptors to long-term, operational noise sources (for example,
35 water pumps) to reduce noise levels below applicable local standards.
- 36 · Conduct a preliminary noise analysis report to determine future operation-related noise and
37 distances to sensitive receptors. Provided that future operation-related noise results in significant
38 at sensitive receptors, incorporate into construction design measures such as a structure encasing
39 the new noise generating infrastructure. Materials (masonry brick, metal shed, wood) used to
40 house the infrastructure will be of solid construction and void of gaps at the ground, roof line, and
41 joints. All vents will include acoustically rated louvers.
- 42 · Locate dog parks no closer than 200 feet from the nearest residential property line and at least
43 75 feet from habitat for noise-sensitive wildlife species.

- 1 " Locate parking lots no closer than 65 feet from the nearest residential property line and at least
2 25 feet from habitat for noise-sensitive wildlife species unless a detailed noise study is conducted
3 that determines that placement of parking lots closer than the distances specified above will not
4 result in noise levels that exceed 67 dBA at the nearest residential property line or 60 dBA from
5 noise-sensitive habitat, or appropriate mitigation measures, including permanent noise barriers,
6 can be incorporated to reduce noise levels to equal the ambient noise level or referenced
7 thresholds for residential property and noise sensitive habitat.
- 8 " Locate playing fields no closer than located at least 125 feet from the nearest residential property
9 line and at least 50 feet from habitat for noise-sensitive wildlife species unless a detailed noise
10 study is conducted that determines that placement of playing fields closer than the distances
11 specified above will not result in noise levels that exceed 67 dBA at the nearest residential
12 property line or 60 dBA from noise-sensitive habitat, or appropriate mitigation measures,
13 including permanent noise barriers, can be incorporated to reduce noise levels to equal the
14 ambient noise level or referenced thresholds for residential property and noise sensitive habitat

15 These mitigation measures are commonly employed on a variety of projects. In many cases, they reduce
16 significant operations-related noise impacts to less-than-significant levels. Implementation of these
17 mitigation measures would reduce the significance of operations-related noise impacts by locating noise-
18 generating facilities or land uses at a distance sufficient from sensitive receptors for noise to attenuate
19 before reaching the sensitive receptor or using construction materials and design features to attenuate
20 noise at the site of operations. In cases when it is not feasible to relocate noise-generating facilities or land
21 uses away from sensitive receptors or the cost of special construction materials or design would prevent a
22 project from being constructed because of severe additional cost relative to the overall cost of the project,
23 operations-related noise impacts would remain **significant**.

24 15.5.4 No Project Alternative

25 As described in Section 2A, Proposed Project and Alternatives, the No Project Alternative is based on the
26 continuation of existing plans and policies and the continued operation of existing facilities into the future
27 and permitted and funded projects. Seven ongoing projects have been identified as part of the No Project
28 Alternative. The list of projects included in the No Project Alternative is presented in Table 2-2.

29 The significance of noise impacts is associated with the effects of excessive noise levels on sensitive
30 receptors. These effects are characterized by intensity (loudness), duration (brief or prolonged), and time
31 of day (expectations differ regarding daytime and ambient noise levels). With the No Project Alternative,
32 project-construction at the seven specific project sites is expected to be completed within the next
33 2-5 years.

34 To the extent that the specific projects are located near sensitive receptors, construction of these facilities
35 could have significant construction-related noise impacts in the near-term period. After construction is
36 completed, construction-related impacts would cease, and noise from project operations would
37 commence. There may be a period of time between the completion of construction and the start of
38 operations.

39 For example, construction of the Freeport Regional Water Project was completed but operations will not
40 start until warranted by dry-year hydrologic conditions. Therefore, in this particular case, the project has
41 no ongoing construction-related or operations-related effects on the ambient noise environment. To the
42 extent that particular noise generating facilities are located near sensitive receptors; whether the project
43 incorporates noise-attenuating construction materials; whether the facilities operate continuously or
44 seasonally, and whether they operate around the clock or only during the daytime, operations-related
45 noise impacts could be significant.

1 With the No Project Alternative, the Delta Plan would not be in place to encourage various other projects
2 to move forward. To the extent that the absence of the Delta Plan prevents those projects from moving
3 forward, there could be fewer construction-related noise impacts in the near term and fewer construction-
4 and operations-related noise impacts over the long-term. Because noise impacts are related to the location
5 of the noise generating activity from sensitive receptors, the No Project Alternative could result in
6 significant construction- and operations-related noise impacts like those of the Proposed Project.

7 The No Project Alternative is expected to have fewer noise impacts than the Proposed Project in the near
8 term because there would be less construction and therefore the reduced possibility of exposing sensitive
9 receptors to excessive noise levels. The No Project Alternative is expected to have fewer long-term noise
10 impacts than the Proposed Project because there would be fewer facilities in operation. Therefore, the No
11 Project Alternative would have **fewer** occurrences of noise impacts when compared to the Proposed
12 Project; however these occurrences may be **significant** depending on site-specific conditions.

13 15.5.5 Alternative 1A

14 With Alternative 1A, the construction and operation of surface water projects (water intakes, treatment
15 and conveyance facilities, and reservoirs) would be the same as under the Proposed Project. As described
16 in Section 2A, Proposed Project and Alternatives, there would be fewer groundwater projects (wells,
17 wellhead treatment, conveyance facilities), ocean desalination projects, and recycled wastewater and
18 stormwater projects (treatment and conveyance facilities) compared with the Proposed Project. Water
19 transfers and water use efficiency and conservation programs also would be reduced relative to the
20 Proposed Project, but these activities would not be expected to generate noise levels that would exceed
21 any of the thresholds of significance.

22 Projects to restore the Delta ecosystem would be reduced in comparison to the Proposed Project.
23 Implementation of flow objectives would not generate noise. Ecosystem stressor management activities
24 and invasive species management (including removal of invasive vegetation) would be the same as
25 described for the Proposed Project.

26 Projects and actions to improve water quality would be the same as under the Proposed Project. Flood
27 risk reduction projects also would be the same as under the Proposed Project, except that there would be
28 less emphasis on levee maintenance and modification for levees that protect agricultural land and more
29 emphasis on levees that protect water supply corridors, which could result in an overall reduction in these
30 activities. Projects to protect and enhance the Delta as an evolving place would be the same as under the
31 Proposed Project.

32 15.5.5.1.1 Impact 15-1: Exposure of Sensitive Receptors to Excessive Temporary, Short-term 33 Construction Noise

34 The same types of temporary noise impacts from construction of water supply reliability projects would
35 occur under Alternative 1A as described under the Proposed Project, but the number of noise-generating
36 activities would be reduced because fewer facilities would be constructed. Temporary noise impacts
37 resulting from the construction associated with habitat restoration also would be reduced because fewer
38 acres of habitat would be restored. Temporary noise impacts from vegetation removal associated with
39 invasive species reduction would be the same for Alternative 1A as for the Proposed Project.

40 With Alternative 1A, less emphasis would be placed on levee construction in sparsely populated
41 agricultural areas, which could lead to a reduction in levee construction relative to the Proposed Project.
42 While fewer miles of levee would be modified and overall noise-generating activities would be reduced,
43 the temporary construction noise could affect a number of noise-sensitive receptors similar to the number
44 that would be affected under the Proposed Project because of the emphasis on protecting levees in
45 populated areas. Thus, the impact could be the **same as** for the Proposed Project.

1 There would be the same construction-related noise impacts as the Proposed Project for the construction
2 of water quality (Section 15.5.3.3) and Delta enhancement (Section 15.5.3.5) projects because Alternative
3 1A would result in the same number of construction projects as the Proposed Project.

4 Overall, significant impacts related to temporary construction noise under Alternative 1A would be **less**
5 **than** under the Proposed Project.

6 As compared to existing conditions, the impacts related to temporary construction noise under
7 Alternative 1A would be **significant**.

8 15.5.5.1.2 Impact 15-2: Temporary and Short-term Exposure of Sensitive Receptors to Excessive 9 Groundborne Vibrations

10 The same types of temporary groundborne vibration impacts from construction would occur under
11 Alternative 1A as described for the Proposed Project, except that there would be fewer water supply
12 reliability projects constructed and levees modified. A reduction in the number of water supply facilities,
13 such as groundwater storage and ocean desalination plants, could reduce the potential for temporary
14 groundborne vibrations that would affect sensitive receptors (historic-era structures such as bridges,
15 trestles, and buildings).

16 Flood risk reduction projects described in Section 15.5.3.4.2, including construction of levees in the
17 Delta, would be less likely under Alternative 1A than under the Proposed Project. If fewer miles of levees
18 would be modified under Alternative 1A, the potential for overall temporary groundborne vibration would
19 be reduced and fewer sensitive receptors could be affected. However, because Alternative 1A emphasizes
20 levee modification in populated areas where most of the sensitive receptors are located, the impacts of
21 temporary groundborne vibrations might be the same as for the Proposed Project.

22 There would be fewer Delta ecosystem restoration projects implemented with Alternative 1A than with
23 the Proposed Project, thereby reducing the potential for groundborne vibration impacts. Nonnative
24 vegetation removal would be the same with Alternative 1A as with the Proposed Project; therefore, there
25 would be no difference for potential groundborne vibration impacts.

26 Impacts resulting from water quality and Delta enhancement projects under Alternative 1A would be the
27 same as described for the Proposed Project.

28 Overall, significant impacts related to temporary groundborne vibrations under Alternative 1A would be
29 **less than** under the Proposed Project.

30 As compared to existing conditions, the impacts related to temporary groundborne vibrations under
31 Alternative 1A would be **significant**.

32 15.5.5.1.3 Impact 15-3: Long-term Exposure of Sensitive Receptors to Excessive Noise from 33 Operations

34 Alternative 1A would have the same types of operational noise impacts as the Proposed Project; however,
35 fewer water supply reliability facilities, such as groundwater storage and ocean desalination, would be
36 operated, thereby reducing the overall amount of noise related to operations when compared with the
37 Proposed Project. Fewer acres of habitat would be restored with Alternative 1A, but operation of
38 restoration sites would not be expected to generate noise that would exceed any significance threshold.
39 The noise impacts associated with operation of water quality and Delta enhancement facilities under
40 Alternative 1A would be the same as under the Proposed Project.

41 Noise generation associated with levee construction and modification would occur primarily during
42 construction. Once constructed, levees would not have noise-generating operations, except for occasional
43 noise generation during maintenance.

1 Overall, significant impacts related to long-term exposure of sensitive receptors to excessive noise from
2 operations under Alternative 1A would be **less than** under the Proposed Project.

3 As compared to existing conditions, the impacts related to long-term exposure of sensitive receptors to
4 excessive noise from operations under Alternative 1A would be **significant**.

5 **15.5.5.2 Mitigation Measures**

6 Mitigation measures for Alternative 1A would be the same as those described in Sections 15.5.3.6.1
7 (Mitigation Measure 15-1), 15.5.3.6.2 (Mitigation Measure 15-2), and 15.5.3.6.3 (Mitigation
8 Measure 15-3) for the Proposed Project. Because it is not known whether the mitigation measures listed
9 above would reduce Impacts 15-1, 15-2, and 15-3 to a less-than-significant level for Alternative 1A, these
10 potential impacts are considered **significant and unavoidable**.

11 **15.5.6 Alternative 1B**

12 With Alternative 1B, the construction and operation of surface water projects (water intakes, treatment
13 and conveyance facilities, and reservoirs) would be the same as under the Proposed Project. As described
14 in Section 2A, Proposed Project and Alternatives, there would be fewer groundwater projects (wells,
15 wellhead treatment, conveyance facilities) and recycled wastewater and stormwater projects (treatment
16 and conveyance facilities) compared with the Proposed Project. Water transfers and water use efficiency
17 and conservation programs, which would be reduced relative to the Proposed Project, would not generate
18 noise. There would be no ocean desalination projects.

19 Projects to restore the Delta ecosystem would be reduced in extent relative to the Proposed Project and
20 would not emphasize restoration of floodplains in the lower San Joaquin River. Implementation of flow
21 objectives would not be accelerated or include public trust considerations. Ecosystem stressor
22 management activities and invasive species management (including removal of invasive vegetation)
23 would be increased compared to the Proposed Project, and a variance to the USACE Levee Vegetation
24 Policy would not be pursued. In addition, Alternative 1B would not require conformance with the habitat
25 types and elevation maps presented in the Conservation Strategy for Restoration of the Sacramento-San
26 Joaquin Delta Ecological Management Zone and the Sacramento and San Joaquin Valley Regions (DFG
27 2011).

28 Water quality improvement projects, including water treatment plants, conveyance facilities, and wells
29 and wellhead treatment facilities would be less emphasized relative to the Proposed Project, and greater
30 emphasis would be placed on the construction and operation of wastewater treatment and recycle
31 facilities, and municipal stormwater treatment facilities.

32 Flood risk reduction would place greater emphasis on levee modification/maintenance and dredging than
33 under the Proposed Project, but there would be no construction of setback levees or subsidence reversal
34 projects. Floodplain expansion projects would be fewer or less extensive, and use of reservoir reoperation
35 would be reduced. Actions to protect and enhance the Delta as an evolving place would be consistent with
36 the Economic Sustainability Plan, but the locations for new parks, as encouraged by the Proposed Project,
37 would not be emphasized.

38 **15.5.6.1.1 Impact 15-1: Exposure of Sensitive Receptors to Excessive Temporary, Short-term** 39 **Construction Noise**

40 With Alternative 1B, the construction of surface water projects, and construction-related temporary noise
41 impacts, would be the same as with the Proposed Project. The reduction in groundwater and recycled
42 wastewater and stormwater projects would result in fewer short-term construction noise impacts
43 associated with those types of facilities. Fewer acres of habitat would be restored with this alternative, but

1 temporary noise impacts from vegetation removal would be greater for Alternative 1B than for the
2 Proposed Project because a variance to the USACE Levee Vegetation Policy would not be pursued.

3 With Alternative 1B, flood risk reduction projects described in Section 15.5.3.4.1 would be less
4 emphasized for levees that protect less populated agricultural lands, and improvements would be focused
5 on levees that protect water supply corridors and urban areas. As described for Alternative 1A, the
6 temporary construction noise could affect a number of noise-sensitive receptors similar to that affected
7 under the Proposed Project because of the emphasis on protecting levees in populated areas.

8 Under Alternative 1B, the emphasis on the types of water quality projects would shift toward more
9 wastewater treatment and recycle facilities and more municipal stormwater treatment facilities and fewer
10 of the other types of water quality improvement facilities. It is unclear if this shift would result in more or
11 less construction activity; therefore, noise impacts are expected to be similar to those under the Proposed
12 Project.

13 Alternative 1B would produce the same types of construction-related noise impacts associated with Delta
14 enhancement projects as would the Proposed Project, but not at the named locations of the proposed State
15 parks.

16 Overall, significant impacts related to temporary construction noise under Alternative 1B would be the
17 **same as** under the Proposed Project.

18 As compared to existing conditions, the impacts related to temporary construction noise under
19 Alternative 1B would be **significant**.

20 15.5.6.1.2 Impact 15-2: Temporary and Short-term Exposure of Sensitive Receptors to Excessive 21 Groundborne Vibrations

22 As described in Section 15.5.6.1.1 above, groundwater and recycled wastewater and stormwater projects
23 would be reduced under Alternative 1B. The construction of fewer facilities could result in a reduced
24 potential for groundborne vibrations to adversely affect sensitive receptors. The impacts associated with
25 other water supply projects would be the same as for the Proposed Project.

26 Because fewer acres of habitat would be restored with this alternative, the potential for a groundborne
27 vibration impact might be reduced, but temporary vibration impacts on historic-era structures from
28 vegetation removal could be greater for Alternative 1B than for the Proposed Project because a variance
29 to the USACE Levee Vegetation Policy would not be pursued.

30 With Alternative 1B, flood risk reduction projects described in Section 15.5.3.4.1 would be less
31 emphasized for levees that protect agricultural lands, and improvements would be focused on levees that
32 protect water supply corridors and urban areas. While fewer miles of levee would be modified and overall
33 vibration-generating activities would be reduced, the temporary construction vibration could affect a
34 number of sensitive receptors (historic-era structures) similar to the number that would be affected under
35 the Proposed Project because of the emphasis on protecting levees in populated areas.

36 Under Alternative 1B, the emphasis on the types of water quality projects would shift toward more
37 municipal stormwater treatment and more wastewater treatment and recycle facilities and fewer of the
38 other types of water quality improvement facilities. It is unclear if this shift would result in more or less
39 construction activity; therefore, impacts are expected to be similar to those under the Proposed Project.

40 With Alternative 1B, flood risk reduction projects described in Section 15.5.3.4.1 would be less
41 emphasized for levees that protect agricultural lands, and improvements would be focused on levees that
42 protect water supply corridors and urban areas. As described for Alternative 1A, the temporary exposure
43 to excessive groundborne vibration could affect a number of sensitive receptors similar to the number that

1 would be affected under the Proposed Project because more historic-era structures would likely be located
2 in the populated areas.

3 The types of groundborne vibration impacts and the overall amount of groundborne vibration impacts
4 related to Delta enhancement projects would be the same for Alternative 1B as for the Proposed Project,
5 but the impacts would not occur at the named locations of the proposed State parks.

6 Overall, significant impacts related to temporary groundborne vibrations under Alternative 1B would be
7 **less than** under the Proposed Project.

8 As compared to existing conditions, the impacts related to temporary groundborne vibrations under
9 Alternative 1B would be **significant**.

10 15.5.6.1.3 Impact 15-3: Long-term Exposure of Sensitive Receptors to Excessive Noise from 11 Operations

12 The number of surface water facilities (water intakes, treatment and conveyance facilities, and reservoirs)
13 in operation under Alternative 1B would be the same as discussed in Section 15.5.3.1.3; therefore,
14 impacts associated with operations-related noise would be the same for Alternative 1B and for the
15 Proposed Project. The reduction in groundwater facilities and recycled wastewater and stormwater
16 projects could result in a reduction in long-term exposure to excessive noise resulting from operation of
17 these facilities relative to the Proposed Project.

18 Under Alternative 1B, less ecosystem restoration activity would be conducted, which would reduce
19 operations-related noise impacts. Vegetation removal related to compliance with the USACE Levee
20 Vegetation Policy is considered a construction project and would have no operations-related noise.

21 The emphasis on the types of water quality projects under Alternative 1B would shift toward more
22 municipal stormwater treatment and more wastewater treatment and recycle facilities and fewer of the
23 other types of water quality improvement facilities. It is unclear if this shift would result in more or less
24 noise generation during operation; therefore, noise impacts during operation are expected to be similar to
25 those under the Proposed Project.

26 Flood risk reduction projects described in Section 15.5.3.4.3 are construction projects only and would not
27 result in any noise-generating operations. Similarly, the operational noise impacts for Delta enhancement
28 projects with Alternative 1B would be the same as those under the Proposed Project, but not at the named
29 locations for the proposed State parks..

30 Overall, significant impacts related to long-term exposure of sensitive receptors to excessive noise from
31 operations under Alternative 1B would be **less than** under the Proposed Project.

32 As compared to existing conditions, the impacts related to long-term exposure of sensitive receptors to
33 excessive noise from operations under Alternative 1B would be **significant**.

34 15.5.6.2 Mitigation Measures

35 Mitigation measures for Alternative 1B would be the same as those described in Sections 15.5.3.6.1
36 (Mitigation Measure 15-1), 15.5.3.6.2 (Mitigation Measure 15-2), and 15.5.3.6.3 (Mitigation
37 Measure 15-3) for the Proposed Project. Because it is not known whether the mitigation measures listed
38 above would reduce Impact 15-1, Exposure of Sensitive Receptors to Excessive Temporary, Short-term
39 Construction Noise, Impact 15-2, Temporary and Short-term Exposure of Sensitive Receptors to
40 Excessive Groundborne Vibrations, and Impact 15-3, Long-term Exposure of Sensitive Receptors to
41 Excessive Noise from Operations, to a less-than-significant level for Alternative 1B, these potential
42 impacts are considered **significant and unavoidable**.

1 15.5.7 Alternative 2

2 As described in Section 2A, Proposed Project and Alternatives, Alternative 2 would place greater
3 emphasis on groundwater, ocean desalination, and recycled water projects and less emphasis on surface
4 water projects. Greater emphasis also would be placed on water transfers and water use efficiency and
5 conservation programs, but these activities would not be expected to generate noise levels that would
6 exceed any of the thresholds of significance. The surface storage reservoirs considered under the DWR
7 Surface Water Storage Investigation would not be encouraged; instead, surface storage at a new facility in
8 the Tulare Basin would be emphasized.

9 Ecosystem restoration projects similar to but less extensive than those encouraged by the Proposed
10 Project would be emphasized. Alternative 2 would emphasize the development of flow objectives that
11 take into consideration updated flow criteria that support a more natural flow regime, water rights, and
12 greater protection of the Public Trust resources, none of which are noise-generating actions.

13 Actions to improve water quality would be similar to or greater than those under the Proposed Project,
14 especially the treatment of wastewater and agricultural runoff. Actions to reduce flood risk under
15 Alternative 2 would emphasize floodplain expansion and reservoir reoperation rather than levee
16 construction and modification. The stockpiling of rock and encouragement of subsidence reversal projects
17 would be the same as under the Proposed Project, as would actions to protect and enhance the Delta as an
18 evolving place.

19 15.5.7.1.1 Impact 15-1: Exposure of Sensitive Receptors to Excessive Temporary, Short-term 20 Construction Noise

21 Under Alternative 2, there would be more construction of groundwater, ocean desalination, and recycled
22 water facilities, potentially exposing a greater number of noise-sensitive receptors to construction-related
23 noise than under the Proposed Project. Fewer pieces of heavy equipment (excavators, graders, scrapers,
24 bulldozers, backhoes, and pile drivers) would be needed for construction of the surface water projects
25 named in the Delta Plan; therefore, the potential that noise-sensitive receptors would be exposed to
26 construction noise in these areas would be reduced. There would be more construction in the Tulare Basin
27 region, potentially exposing noise-sensitive receptors to noise levels that exceed local thresholds.
28 Construction-related noise generated during ecosystem restoration would be less with Alternative 2 than
29 with the Proposed Project because restoration activities would be less extensive, possibly reducing the
30 number of noise-sensitive receptors exposed to construction-related noise.

31 There would be more wastewater treatment and agricultural runoff facilities constructed under
32 Alternative 2 than under the Proposed Project. A similar number of the other types of water quality
33 improvement facilities would be constructed. It is unclear whether this shift would result in more or less
34 construction activity; therefore, noise impacts are expected to be similar but possibly greater compared to
35 the Proposed Project, depending on the location of construction.

36 Flood risk reduction projects described in Section 15.5.3.4.1, including construction of levees in the
37 Delta, may be less likely under Alternative 2 because flood risk management would emphasize floodplain
38 expansion and dam operations more than the Proposed Project. Construction-related noise from
39 floodplain expansion would likely cause similar or reduced noise impacts than the Proposed Project
40 because these actions would occur in less populated agricultural areas rather than in the more populated
41 urban areas where levee modifications would occur under the Proposed Project. Dam operations do not
42 cause construction-related noise. Rock stockpiling and temporary noise impacts from construction of
43 Delta enhancement projects would be the same for Alternative 2 as for the Proposed Project.

44 Overall, significant impacts related to temporary construction noise under Alternative 2 would be the
45 **same as** under the Proposed Project.

1 As compared to existing conditions, the impacts related to temporary construction noise under
2 Alternative 2 would be **significant**.

3 15.5.7.1.2 Impact 15-2: Temporary and Short-term Exposure of Sensitive Receptors to Excessive 4 Groundborne Vibrations

5 As described in Section 15.5.7.1, there would be more construction of groundwater, ocean desalination,
6 and recycled water facilities, potentially exposing more sensitive receptors to groundborne vibration
7 impacts than would occur under the Proposed Project. The number of groundborne vibration impacts
8 from construction of the surface water projects named in the Delta Plan would be fewer than under the
9 Proposed Project, but there would be more impacts in the Tulare Basin region because surface water
10 storage would be focused in Tulare Lake. Groundborne vibrations generated during ecosystem restoration
11 would be less with Alternative 2 for the reasons given above in Section 15.5.7.1.

12 More wastewater treatment and agricultural runoff facilities would be constructed under Alternative 2
13 than under the Proposed Project. A similar number of the other types of water quality improvement
14 facilities would be constructed for this alternative and for the Proposed Project. It is unclear if this shift
15 would result in more or less construction activity; therefore, groundborne vibration impacts are expected
16 to be similar to but possibly greater than those under the Proposed Project.

17 Under Alternative 2, flood risk management would emphasize floodplain expansion and dam operations
18 more than would be emphasized under the Proposed Project. For the reasons given in Section 15.5.7.1,
19 construction-related groundborne vibrations would likely be less with this alternative than with the
20 Proposed Project. Rock stockpiling and groundborne vibration impacts from construction of Delta
21 enhancement projects would be the same for Alternative 2 as for the Proposed Project.

22 Overall, significant impacts related to temporary groundborne vibrations under Alternative 2 would be the
23 **same as** under the Proposed Project.

24 As compared to existing conditions, the impacts related to temporary groundborne vibrations under
25 Alternative 2 would be **significant**.

26 15.5.7.1.3 Impact 15-3: Long-term Exposure of Sensitive Receptors to Excessive Noise from 27 Operations

28 Implementation of Alternative 2 would result in the operation of more groundwater, ocean desalination,
29 and recycled water facilities, potentially exposing a greater number of noise-sensitive receptors to noise
30 levels that could exceed local noise standards, particularly during 24-hour operations where a nighttime
31 noise ordinance is in place. Operations-related noise impacts of the surface water projects named in the
32 Delta Plan would be less with Alternative 2 but greater in the Tulare Basin region. As described in
33 Section 15.5.5.3, operations of ecosystem restoration projects would not generate noise that would exceed
34 local noise standards.

35 More wastewater treatment and agricultural runoff facilities would be constructed under Alternative 2
36 than under the Proposed Project. A similar number of the other types of water quality improvement
37 facilities would be in operation for this alternative and for the Proposed Project. It is unclear if this shift
38 would result in more or less operations-related noise impacts; therefore, noise impacts are expected to be
39 similar to but possibly greater than those under the Proposed Project, depending on the location of new
40 facilities.

41 Flood risk reduction projects are construction projects (floodplain expansion and levee work) and do not
42 generate noise during operations. Reoperation of existing dams for flood protection purposes would not
43 generate noise differently from existing conditions. Therefore, noise impacts from operation of flood risk
44 reduction projects would be the same for Alternative 2 as for the Proposed Project. Rock stockpiling is a

1 construction impact and does not generate operations-related noise. The amount of noise impacts from
2 operations of Delta enhancement projects would be the same for Alternative 2 as for the Proposed Project.

3 Overall, significant impacts related to long-term exposure of sensitive receptors to excessive noise from
4 operations under Alternative 2 would be **greater than** under the Proposed Project.

5 As compared to existing conditions, the impacts related to long-term exposure of sensitive receptors to
6 excessive noise from operations under Alternative 2 would be **significant**.

7 **15.5.7.2 Mitigation Measures**

8 Mitigation measures for Alternative 2 would be the same as those described in Sections 15.5.3.6.1
9 (Mitigation Measure 15-1), 15.5.3.6.2 (Mitigation Measure 15-2), and 15.5.3.6.3 (Mitigation
10 Measure 15-3) for the Proposed Project. Because it is not known whether the mitigation measures listed
11 above would reduce Impact 15-1, Exposure of Sensitive Receptors to Excessive Temporary, Short-term
12 Construction Noise, Impact 15-2, Temporary and Short-term Exposure of Sensitive Receptors to
13 Excessive Groundborne Vibrations, and Impact 15-3, Long-term Exposure of Sensitive Receptors to
14 Excessive Noise from Operations, to a less-than-significant level for Alternative 2, these potential impacts
15 are considered **significant and unavoidable**.

16 **15.5.8 Alternative 3**

17 As described in Section 2A, Proposed Project and Alternatives, the water supply reliability projects and
18 actions under Alternative 3 would be similar to those of the Proposed Project, although there would be
19 less emphasis on surface water projects. Ecosystem restoration (floodplain restoration, riparian
20 restoration, tidal marsh restoration, and floodplain expansion) would be limited in extent when compared
21 to the Proposed Project and focused on publicly owned lands, especially in Suisun Marsh and the Yolo
22 Bypass. There would be more ecosystem stressor management actions (e.g., programs for water quality,
23 water flows) and more management for nonnative invasive species. Water quality improvements would
24 be the same as for the Proposed Project.

25 Actions under Alternative 3 to reduce flood risk would not include setback levees or subsidence reversal
26 but would result in greater levee modification/maintenance and dredging relative to the Proposed Project.
27 Reservoir reoperation and rock stockpiling would be the same as for the Proposed Project, as would
28 activities to protect and enhance the Delta as an evolving place.

29 **15.5.8.1.1 Impact 15-1: Exposure of Sensitive Receptors to Excessive Temporary, Short-term** 30 **Construction Noise**

31 With the exception of the surface water storage projects named in the Delta Plan, a similar number of
32 water supply reliability facilities (groundwater, ocean desalination, and recycled water facilities) would be
33 constructed under Alternative 3 and under Proposed Project. Noise-sensitive receptors could be exposed
34 to the same or a similar noise level from the construction of treatment facilities, but there would be
35 potentially fewer noise-sensitive receptors exposed to construction-related noise from surface water
36 storage projects. Construction-related noise generated during ecosystem restoration would be less with
37 Alternative 3 than with the Proposed Project because restoration activities would be less extensive,
38 limited to public lands primarily in Suisun Marsh and the Yolo Bypass, possibly reducing the number of
39 noise-sensitive receptors exposed to construction-related noise.

40 The same amount and types of water quality improvement projects would be constructed under
41 Alternative 3 and under the Proposed Project, adversely affecting the same number of noise-sensitive
42 receptors.

43 Flood risk reduction projects described in Section 15.5.3.4.1, including construction of levees in the
44 Delta, may be less likely under Alternative 3 because flood risk management would emphasize

1 modification of existing levees, dredging, and dam operations. Construction-related noise from levee
2 modifications would likely cause a similar or greater number of noise impacts compared with the
3 Proposed Project because these actions would occur in more populated urban levee-protected areas. Noise
4 from dredging, both from barges and from land-side side-casting equipment, would be greater under this
5 alternative than under the Proposed Project because these actions would take greater precedence under
6 Alternative 3. Dam operations do not cause construction-related noise. Rock stockpiling and temporary
7 noise impacts from construction of Delta enhancement projects would be the same for Alternative 3 as for
8 the Proposed Project.

9 Overall, significant impacts related to temporary construction noise under Alternative 3 would be the
10 **same as** under the Proposed Project.

11 As compared to existing conditions, the impacts related to temporary construction noise under
12 Alternative 3 would be **significant**.

13 15.5.8.1.2 Impact 15-2: Temporary and Short-term Exposure of Sensitive Receptors to Excessive 14 Groundborne Vibrations

15 As discussed in Section 15.5.8.1 above, groundborne vibration impacts related to construction of
16 groundwater, ocean desalination, and recycled water facilities would be similar for Alternative 3 and for
17 the Proposed Project but would be less for Alternative 3 in the areas of the surface water storage projects
18 named in the Delta Plan. Construction-related groundborne vibrations generated during ecosystem
19 restoration would be less under Alternative 3 than under the Proposed Project because restoration
20 activities would be less extensive, limited to public lands primarily in Suisun Marsh and the Yolo Bypass,
21 possibly reducing the number of sensitive receptors exposed to groundborne vibrations.

22 The same number and types of water quality improvement projects would be constructed under
23 Alternative 3 as under the Proposed Project, adversely affecting the same number of sensitive receptors.

24 As discussed in Section 15.5.8.1, flood risk reduction projects would involve a larger number of levee
25 modifications, dredging, and dam operations under Alternative 3 than under the Proposed Project.
26 Construction-related groundborne vibrations from levee modifications would likely cause a similar or
27 greater number of vibration impacts compared with the Proposed Project because these actions would
28 occur in more populated urban levee-protected areas. Groundborne vibrations would not be generated
29 from dredging dam operations. Rock stockpiling and temporary groundborne vibrations impacts from
30 construction of Delta enhancement projects would be the same for Alternative 3 as for the Proposed
31 Project.

32 Overall, significant impacts related to temporary groundborne vibrations under Alternative 3 would be the
33 **same as** under the Proposed Project.

34 As compared to existing conditions, the impacts related to temporary groundborne vibrations under
35 Alternative 3 would be **significant**.

36 15.5.8.1.3 Impact 15-3: Long-term Exposure of Sensitive Receptors to Excessive Noise from 37 Operations

38 The amount of noise generated during operations of water supply reliability facilities (groundwater, ocean
39 desalination, and recycled water facilities) under Alternative 3 would be similar to that generated under
40 the Proposed Project and could exceed local noise standards, such as a nighttime noise ordinance. There
41 would be less operations-related noise from surface water storage projects, which would be deemphasized
42 under Alternative 3 compared to the Proposed Project. Operations of ecosystem restoration projects
43 would not generate noise that would exceed local noise standards.

1 The amount and types of water quality improvement projects in operation under Alternative 3 would be
2 the same as under the Proposed Project, adversely affecting the same number of noise-sensitive receptors.

3 Flood risk reduction projects are construction projects and do not generate noise during operations.
4 Reoperation of existing dams for flood protection purposes would not generate noise differently from
5 existing conditions. Rock stockpiling is a construction impact and does not generate operations-related
6 noise. The amount of noise impacts from operations of Delta enhancement projects would be the same for
7 Alternative 3 as for the Proposed Project.

8 Overall, significant impacts related to long-term exposure of sensitive receptors to excessive noise from
9 operations under Alternative 3 would be **less than** under the Proposed Project.

10 As compared to existing conditions, the impacts related to long-term exposure of sensitive receptors to
11 excessive noise from operations under Alternative 3 would be **significant**.

12 **15.5.8.2 Mitigation Measures**

13 Mitigation measures for Alternative 3 would be the same as those described in Sections 15.5.3.6.1
14 (Mitigation Measure 15-1), 15.5.3.6.2 (Mitigation Measure 15-2), and 15.5.3.6.3 (Mitigation
15 Measure 15-3) for the Proposed Project. Because it is not known whether the mitigation measures listed
16 above would reduce Impact 15-1, Exposure of Sensitive Receptors to Excessive Temporary, Short-term
17 Construction Noise, Impact 15-2, Temporary and Short-term Exposure of Sensitive Receptors to
18 Excessive Groundborne Vibrations, and Impact 15-3, Long-term Exposure of Sensitive Receptors to
19 Excessive Noise from Operations, to a less-than-significant level for Alternative 3, these potential impacts
20 are considered **significant and unavoidable**.

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