

12.1 Environmental Setting

12.1.1 Introduction, Sources of Information, and Terminology

This chapter describes noise conditions in the project area. It includes regulatory, regional, and project settings to provide a context for analyzing the effects of the project. Information about noise in Napa, Sonoma, and Marin Counties was adapted from the Napa and Sonoma County General Plans and the Novato General Plan. Additional information was taken from the City of American Canyon General Plan EIR. State and local agencies have developed guidelines for evaluating land use compatibility under different sound-level ranges; “Regulatory Setting” below summarizes those guidelines at both the state and county level. “Regional Setting” and “Project Setting” describe existing noise conditions at and adjacent to the project site.

The following noise terminology is used in this chapter:

- *Noise*: Sound that is loud, unpleasant, unexpected, or otherwise undesirable.
- *Decibel (dB)*: A unitless measure of sound on a logarithmic scale that indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micropascals.
- *A-Weighted Decibels (dBA)*: An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
- *Equivalent Sound Level (L_{eq})*: A logarithmic average of noise levels from all sources of noise in a given area over a stated period of time (e.g., 24 hours, 1 year).
- *Day-Night Equivalent Sound Level (L_{dn})*: A 24-hour average sound level with a 10-decibel “penalty” added to noise during the hours between 10 p.m. and 7 a.m. to account for the greater noise sensitivity of people at night.
- *Sensitive Receptor*: A population that is more susceptible to impacts than is the general population. Sensitive noise receptors include schools, residences, child care centers, health care facilities, and convalescent centers.

12.1.2 Regulatory Setting

In 1987, DHS published guidelines for the noise elements of local general plans. DHS has recognized the normally acceptable range for low-density residential uses, less than 65 dB L_{dn} and 55–70 dBA, as conditionally acceptable.

The Napa County Noise Ordinance states that residences in a rural area must not be exposed to noise levels greater than 45 dBA for more than half an hour between the hours of 10 p.m. and 7 a.m. Noise levels must not exceed 50 dBA L_{dn} between the hours of 7 a.m. and 10 p.m.

The county noise ordinance requires that construction activities begin no earlier than 7 a.m. and cease no later than 7 p.m. The ordinance also states that construction-related noise must not exceed 75 dBA in residential areas.

The noise element of the Sonoma County General Plan, as adopted in 1989 and revised in 1994, indicates that typical noise levels for sensitive areas range from 40 to 50 dB L_{dn} . Areas in Sonoma County are considered noise impacted if they are exposed to noise levels exceeding 60 dB L_{dn} . These thresholds pertain to an average noise level over a 24-hour period.

The Solano County General Plan also includes noise thresholds for permanent facilities and construction-related activities. The maximum allowable noise levels from construction equipment average 75 dBA at 50 feet.

The Novato General Plan was first adopted in 1996. It was updated in 1999 and 2001 to address new information and concerns regarding community noise exposure levels. The guidelines establish the following threshold outdoor noise levels.

- Up to 60 dB L_{dn} is normally acceptable for outdoor noise for residential developments, motels and hotels, schools, libraries, churches, hospitals, and nursing homes;
- up to 65 dB L_{dn} is normally acceptable for playgrounds, neighborhood parks, and open space; and
- up to 70 dB L_{dn} is normally acceptable for office buildings, golf courses, concert halls, cemeteries, and industrial and manufacturing sites.

These thresholds pertain to an average noise level over a 24-hour period.

12.1.3 Regional Setting

Although portions of Napa, Sonoma, Solano, and Marin Counties are urbanized, most of each county is generally considered rural. Ambient noise levels in urban areas typically range from approximately 60 to 70 dBA, and in rural areas from approximately 40 to 50 dBA. Major producers of noise in the counties include highway traffic, trains, planes, and industry-related machinery at various

industrial zones. Noise levels typically range from 25 dBA in rural areas to as high as 100 dBA in industrial areas. The counties have several noise-sensitive areas, including urban residential zones, schools, hospitals, and wildlife management areas.

12.1.4 Project Setting

12.1.4.1 Napa River Unit

The Napa River Unit is located in a rural area of Napa and Solano Counties. There are currently two major sources of noise near the project area. SR 37 borders the project area to the south, and the Napa County Airport is approximately 1.5 miles from the northeast corner of the project area. There are approximately 60 single-family homes along the eastern edge of Edgerley Island, immediately east of Pond 8. The nearest home is about 100 feet from Pond 8 and 1,200 feet from Ponds 7 and 7A. Homes in the Slaughterhouse Point neighborhood across the Napa River are approximately 1,000 feet from Pond 4. Because the project area is considered rural, the noise setting in the middle of the project area would most likely be between 25 and 35 dBA.

12.1.4.2 Water Delivery Project and Program Component Areas

The alignment of the Sonoma Pipeline, proposed as part of the Project Component of the Water Delivery Option, is located in a rural area of Sonoma County. The alignment is bordered primarily by a wildlife preserve, pasture, and vineyards to the south and vineyards and pasture to the north. Traffic noise from SR 12/121 and the Valley of the Moon Trap Club are the only significant noise sources in the immediate area. Although much of the Sonoma Pipeline alignment occurs within the NWPRA's ROW, the subject rail line is not currently in service. Napa County Airport is located a couple of miles east of the alignment. There are a few scattered homes along Ramal Road north of the alignment. Additionally, there are homes north of the alignment on Burndale Road and south of SR 12/121 near 8th Street East. The nearest homes are approximately 300 feet to 0.25 mile from the alignment.

The proposed CAC Pipeline alignment extends along Green Island Road and Mezzetta Road. The two major noise sources in the area include Napa County Airport, located approximately 1 mile to the north, and SR 29, which runs perpendicular to the alignment to the east. Truck traffic along Green Island Road and minimal operations by the California Northern Railroad also add to the existing noise in the area. There are 15 homes along the north side of Green Island Road. The homes are set back from the road by approximately 50–200 feet.

The Napa Pipeline alignment extends along Buchli Station Road, Las Amigas Road, and Stanly Lane. The only major noise source in the area is the Napa County Airport, located approximately 3 miles southeast of Segment 1. There are scattered homes along these roadways that are set back from the road by approximately 50 feet to 200 feet.

The potential pipeline alignment that would bring water from the LGVSD and Novato SD WWTPs under the Program Component of the Water Delivery Alternative includes portions of U.S. 101, SR 37, and SR 121. Existing major noise sources in these areas include vehicle traffic on the highways and the Marin County Airport at Gness Field (north of Novato). Pockets of residential areas as well as industrial, recreational, and commercial areas frame the subject alignment.

The potential pipeline placement from the city of Petaluma would cross a rural area of Sonoma County. There are two major existing noise sources in the immediate area: Sears Point Raceway and Schellville Field (private airport). Napa County Airport is located about 15 miles east of the alignment and Marin County Airport at Gness Field is approximately 5 miles southwest of the alignment.

12.2 Environmental Impacts and Mitigation Measures

12.2.1 Methodology and Significance Criteria

Project-related noise effects were quantitatively evaluated by considering construction effects. To assess the effects of construction noise, typical construction noise levels were predicted and compared to the ambient noise level in the vicinity of the project area. Because potential changes or additions of water pumps or recreational activities are not expected to raise ambient noise levels for residents outside the project area, they were not evaluated in noise effects.

Criteria based on the noise ordinances found in the Napa, ~~and Sonoma~~, and Solano County General Plans, the City of American Canyon General Plan EIR, and the Novato General Plan as well as the State CEQA Guidelines were used to determine the significance of noise impacts. The project would have a significant impact on noise if it would:

- increase ambient noise levels for sensitive receptors, thereby exceeding standards established in the local general plan or noise ordinance;
- result in a substantial permanent increase in ambient noise levels in the project vicinity above existing, no-project levels; or

- allow construction activities to occur at times other than between 7 a.m. and 7 p.m., or if during daytime hours noise levels would be perceived by the nearest resident as 75 dBA or higher.

The thresholds established by the Sonoma and Marin County General Plans pertain to a 24-hour average noise level, including the assignment of a penalty for noise occurring at night because of the more disturbing/intrusive nature of noise during that period. However, the project would not produce any notable operational noise; noise produced from construction would be short-term and only during daytime hours. As such, noise levels associated with construction activities cannot be compared to the L_{dn} thresholds.

Napa County, on the other hand, has established a construction-related noise threshold in addition to guidelines for long-term noise exposure. Since neither Sonoma nor Marin County has specific ordinances for construction-related noise, for the purposes of this EIR/EIS, the construction-related thresholds listed in Napa County's noise ordinance were used for construction noise level significance determinations for all three counties.

Solano County has a list of maximum allowable noise levels from construction equipment. Maximum noise levels for most construction equipment is 75 dBA but up to 95 dBA is allowed for pile drivers.

Table 12-1 summarizes typical noise levels produced by construction equipment commonly used on construction projects. As indicated, equipment involved in construction is expected to generate noise levels ranging from ~~76~~55 dB to ~~89~~95 dB at a distance of 50 feet. Noise produced by construction equipment would be reduced at a rate of about 6 dB per doubling of distance.

Table 12-1. Noise Emission Levels of Construction Equipment

Equipment	Typical Noise Level (dBA) 50 Feet from Source
Long-reach excavator	85 ¹
Diesel-powered barges	85 ²
Small to medium bulldozers	85
Dump trucks	84
Small clamshell dredge	80 ³
Sheet pile driver	95
Crane	82
Front-end loader	80
Small boat	55 ⁴

¹ Assumed same as Excavator.
² Assumed same as Dump Truck.
³ Geier and Geier Consulting 1997.
⁴ Assumed same as Pickup Truck.
Source: Thalheimer 1996.

A reasonable worst-case assumption is that the three loudest pieces of equipment would be operated simultaneously and continuously over a period of at least 1 hour. The combined sound level of three of the loudest pieces of equipment listed in Table 12-1 above (sheet pile driver, long-reach excavator, and a diesel-powered barge) is 96 dBA measured at 50 feet from the source. Table 12-2, which assumes this combined source level, summarizes predicted noise levels at various distances from an active construction site. These estimations of noise levels take into account attenuation (reduction in sound level) based on increasing distance, attenuation from molecular absorption, and anomalous excess attenuation (Hoover and Keith 1996).

Table 12-2. Estimated Construction Noise in the Vicinity of an Active Construction Site

Distance to Receptor (feet)	Sound Level at Receptor (dBA)	Comments
50	96	
100	90	
200	84	
300	80	
500	75	Significance threshold
750	71	<u>Nearest residential area for Pond 8 improvements</u>
1,000	68	
1,500	64	
2,000	61	
2,500	58	
3,000	55	<u>Nearest residential area for most construction</u>
4,000	51	
5,280	47	
7,500	40	

Notes:

The following assumptions were used:

Basic sound level dropoff rate: 6.0 dB per doubling of distance

Molecular absorption coefficient: 0.7 dB per 1,000 feet

Anomalous excess attenuation: 1.0 dB per 1,000 feet

Reference sound level: 96 dBA

Distance for reference sound level: 50 feet

This calculation does not include the effects, if any, of local shielding, which may reduce sound levels further.

12.2.2 No-Project Alternative

12.2.2.1 Impact N-1: Temporary Increase in Ambient Noise Levels as a Result of Emergency Repairs

Under the No-Project Alternative, limited levee reconstruction would occur in the event of the failure or catastrophic breach of the levees. The timing and duration of these reconstruction activities is unknown because it would depend on the extent of levee damage and the need for emergency repairs. However, emergency levee repairs could be expected to require equipment that could exceed county noise ordinance thresholds. Such equipment could produce approximately 90 dBA at residences on Edgerley Island if repair work is needed for Pond 8, and 55 dBA at residences in the Slaughterhouse Point neighborhood if work is needed on the northeast corner of Pond 3 or the east side of Pond 4. (The vandalism at Pond 3 will not be repaired because adverse effects are not anticipated and it is consistent with the general salinity reduction approach that

the project sponsors are pursuing.) The need to provide advance notice to neighbors and to ensure that equipment has appropriate sound-control devices could delay the ability to respond to needed emergency repairs. This impact is considered significant. Because this alternative would result in no project being implemented, no mitigation is required.

12.2.3 Salinity Reduction Option 1A: Napa River and Napa Slough Discharge

12.2.3.1 Impact N-2: Temporary Increase in Ambient Noise Levels as a Result of Construction

Construction of facilities associated with this option would result in a temporary increase in ambient noise levels for residents on Edgerley Island and in Slaughterhouse Point neighborhoods. ~~Canal reconstruction adjacent to Pond 7 and~~ installation of water control structures at Ponds 3, 4, 5, 7, 7A, and 8 would be the primary sources of noise related to construction activities. Each phase of construction is planned for a different time period: ~~canal reconstruction at Pond 7 is expected to take approximately 3–4 weeks; and levee breaches between Ponds 4 and 5 are expected to be completed within 2 weeks of initiation.~~

Construction-related noise associated with ~~enlargement of the canal adjacent~~ mixing chamber improvements and construction of recycled water pipeline to Pond 7 are the main construction efforts at Ponds 7 and 7A. There will be installation of a water control structure at ponds Pond 8 near the Edgerley Island residences. ~~In addition, levees at Ponds 7, 7A, and 8 will be repaired. to Pond 7 would increase outside noise levels for the nearest residents.~~ Because the nearest noise receptor is ~~750+~~ 200 feet from a construction site, it is expected that outside noise levels in the nearest residential area could be as high as ~~71~~ 68 dBA (Table 12-2). This impact is considered less than significant because it does not violate the threshold level of 75 dBA for construction activities in a residential area as established by the Napa County Noise Ordinance.

Operation of water control structures at Ponds 7, 7A, and 8 is not expected to generate any appreciable noise. ~~and related water pumps at Ponds 7, 7A, and 8 could decrease as result of increased tidal influence on the project area. Because there would be no anticipated additional increase in noise effects, impacts associated with operation of existing pumps are considered to be less than significant.~~

This impact is considered less than significant. No mitigation is required.

12.2.3.2 Impact N-3: Temporary Increase in Noise Levels as a Result of Blasting Activities

Salinity Reduction Option 1A would also involve the use of explosives for breaching internal levees in the project area. Blasting of levees would result in a temporary increase in noise levels during daytime hours within the project area. A typical sound level for blasting, measured at 50 feet from the source, is 94 dBA (Hoover and Keith 1996). Table 12-3 shows estimated blasting noise levels in the vicinity of an active blasting site and lists the assumptions on which the noise-level calculations were based. As indicated in Table 12-3, the nearest sensitive receptors are approximately 1 mile from the proposed blasting location between Ponds 4 and 5. Because of the attenuation characteristics of such blasting activities, it is not expected that these residents would be exposed to increases in outside noise levels. This is also confirmed by DFG's experience with blasting the levee between Pond 4/5 and Pond 2A. This impact is considered less than significant. No mitigation is required.

Table 12-3. Estimated Blasting Noise in the Project Construction Area

Distance to Receptor (Feet)	Sound Level at Receptor (dBA)
50	94
100	88
200	82
400	75
600	71
800	69
1,000	66
1,500	62
2,000	59
2,500	56
3,000	53
4,000	49
5,280	45 (nearest residential area)
7,500	38

The following assumptions were used:

Basic sound level drop-off rate:	6.0 dB per doubling of distance
Molecular absorption coefficient:	0.7 dB per 1,000 feet
Analogous excess attenuation:	1.0 dB per 1,000 feet
Reference sound level:	94 dBA
Distance for reference sound level:	50 feet

12.2.4 Salinity Reduction Option 1B: Napa River and Napa Slough Discharge and Breach of Pond 3

Impacts under Salinity Reduction Option 1B (Impacts N-2 and N-3) are nearly the same as those under Salinity Reduction Option 1A except that additional blasting would be required under this option.

12.2.5 Salinity Reduction Option 1C: Napa River and Napa Slough Discharge with Breaches of Ponds 3 and 4/5

Impacts under Salinity Reduction Option 1C (Impacts N-2 and N-3) are nearly the same as those under Salinity Reduction Option 1A except that additional blasting would be required under this option. The option would require the most blasting, including approximately two more explosives charges, but this temporary short-term increase in noise is not expected to adversely affect nearby residents.

12.2.6 Salinity Reduction Option 2: Napa River and San Pablo Bay Discharge

Impacts under Salinity Reduction Option 2 (Impacts N-2 and N-3) are nearly the same as those under Salinity Reduction Option 1A.

12.2.7 Water Delivery Option

12.2.7.1 Impact N-2: Temporary Increase in Ambient Noise Levels as a Result of Construction

Water Delivery Project Component (Sonoma Pipeline)

Noise related to the construction of the Sonoma Pipeline would be caused by engine exhaust, fans, transmissions, and other mechanical equipment during the installation of the pipeline. A crane (82 dBA at 50 feet), excavator (84 dBA at 50 feet), and front-end loader (80 dBA at 50 feet) running simultaneously could produce peak construction noise levels of approximately 87 dBA at 50 feet. Sensitive receptors south of SR 12/121 near 8th Street East as well as the homes at the end of Burndale Road would be most affected by an increase in ambient noise levels because of their proximity to the construction area. If and when the three aforementioned types of construction equipment were operating simultaneously, the decibel range at this receptor would be 72 dBA. The noise level at the sensitive receptors would be less than the threshold for significance, which is 75 dBA. Therefore, this impact is considered less than significant. No mitigation is required.

Water Delivery Project Component (Napa Pipeline)

Project-related construction noise along the Napa Pipeline would be caused by engine exhaust, fans, transmissions, and other mechanical equipment.

Commercial, industrial, and residential land uses border the proposed alignment with homes located within 50–200 feet of the construction zones. At this distance, the decibel range associated with the simultaneous operation of construction equipment (see above) would be approximately 75–87 dBA. This value represents a potential exceedance of the Napa County Noise Ordinance, which states that construction-related noise must not exceed 75 dBA in residential areas. In the short term, project-related construction noise would create noticeably higher ambient noise levels than currently exist at the sensitive receptors. This impact is considered significant. Implementation of Mitigation Measure N-1 would reduce this impact, but not to a less-than-significant level.

Mitigation Measure N-1: Decrease Noise Levels with Use of Noise Reduction Devices

The construction contractor will outfit and maintain construction equipment operating near noise sensitive receptors with noise-reduction devices such as high-efficiency mufflers to minimize construction noise. The use of noise-reduction devices will reduce noise by an average of 5–10 dBA at 50 feet. Wherever possible, noise-generating construction equipment will be shielded by the use of buffers such as structures or truck trailers. Such measures will reduce the predicted noise levels of 75–87 dBA associated with a scenario where three pieces of heavy-duty construction equipment are operating simultaneously.

Water Delivery Project Component (CAC Pipeline)

Project-related construction noise along the CAC Pipeline would be caused by engine exhaust, fans, transmissions, and other mechanical equipment. Primarily residential land uses border the proposed alignment with homes located within 50–200 feet of the construction zones. As stated above for the Napa Pipeline, at this distance, decibel ranges would exceed 75dBA, the threshold outlined in the Napa County Ordinance. In the short term, project-related construction noise would create noticeably higher ambient noise levels than currently exist at the sensitive receptors. This impact is considered significant. Implementation of Mitigation Measure N-1 (see above) would reduce this impact, but not to a less-than-significant level.

Water Delivery Program Component

Exact alignments and construction methods have not yet been determined for the pipelines associated with the Program Component of the Water Delivery Option. It is anticipated, however, that construction-related noise impacts of the Program Component (i.e., construction of potential future pipelines from the City of Petaluma, Novato SD, and LGVSD WWTPs) would be comparable to those described above for the Project Component. Based on preliminary alignment configurations, construction corridors would border sections of residential, commercial, agricultural, and industrial land uses. Sensitive noise receptors such as residences are likely to occur along the route and the noise levels at the receptors would depend on the setback distance of those receptors.

Project impact significance would be based on city and/or county noise thresholds as outlined above. It is possible, if not likely, that construction-related impacts would exceed thresholds of significance at some location where noise sensitive receptors are nearby. This impact is considered significant. Implementation of Mitigation Measure N-1, “Decrease Noise Levels with Use of Noise Reduction Devices,” would reduce this impact, but not to a less-than-significant level. This mitigation measure is described under “Water Delivery Project Component (Napa Pipeline)” above.

12.2.7.2 Impact N-4: Exposure of People to Excessive Ground Vibration

Water Delivery Project Component

The breaking of road pavement, movement of heavy equipment, and excavation of trenches could cause the ground to vibrate. Such vibration could be perceptible to people who are at or near the construction activity area, but it would be very localized, temporary (lasting 1 year), and of short, sporadic duration (i.e., periodically during a 3–5 day period). The occupied areas along the Sonoma Pipeline alignment are set back from the construction area a distance of between approximately 300 feet and 0.25 mile. Given that construction-related ground vibration would generally be confined to the immediate vicinity of the activity area and would be temporary, transitory, and short-term, it would not be considered excessive. This impact is considered less than significant. No mitigation is required.

There are 15 homes along Green Island Road that border the CAC Pipeline alignment; there are also scattered homes that border Buchli Station Road, Las Amigas Road, and Stanly Lane along the Napa Pipeline. These homes are set back from the road (i.e., construction area) a distance of approximately 50–200 feet. As stated above, ground vibration would only be felt in the immediate vicinity and would be temporary. This impact is considered less than significant. No mitigation is required.

Water Delivery Program Component

Exact alignments and construction methods have not yet been determined for the pipelines associated with the Program Component of the Water Delivery Option. It is anticipated, however, that impacts of ground vibration on receptors along the potential future pipelines would be comparable to those described above for the Project Component. There would be pockets of residential areas and other sensitive receptors along the potential pipeline routes. As characterized above, the construction-related ground vibrations would be very localized, temporary, and short-term. This impact is considered less than significant. No mitigation is required.

12.2.8 Habitat Restoration Option 1: Mix of Ponds and Tidal Marsh

Impacts under Habitat Restoration Option 1 (Impacts N-2 and N-3) are nearly the same as those under Salinity Reduction Option 1A, except that excavation of starter channels and levees, and construction of additional breaches for restoration would be required for this option. Although construction timing and activities would vary slightly, the same equipment would be used.

12.2.9 Habitat Restoration Option 2: Tidal Marsh Emphasis

Impacts under Habitat Restoration Option 2 (Impacts N-2 and N-3) are nearly the same as those under Habitat Restoration Option 1. These construction activities would be more extensive than under Habitat Restoration Option 1 because of additional construction on Ponds 2E and 6/6A, but operational noise would be somewhat less because less maintenance would be required. †The impact conclusions are the same.

12.2.10 Habitat Restoration Option 3: Pond Emphasis

Impacts under Habitat Restoration Option 3 (Impacts N-2 and N-3) are nearly the same as those under Habitat Restoration Option 1. This option would be the least intensive during construction and most intensive during maintenance, but the impact conclusions are the same.

12.2.11 Habitat Restoration Option 4: Accelerated Restoration

Impacts under Habitat Restoration Option 4 (Impacts N-2 and N-3) are nearly the same as those under Habitat Restoration Option 1. There would be some additional noise associated with the construction of this option because of the use of fill material, but the impact conclusions are the same.