4.10 Noise

This section evaluates the potential impacts related to noise and vibration during construction and operation of the project.

4.10.1 Existing Setting

Fundamentals of Acoustics

Noise may be defined as unwanted sound. Noise is often objectionable when it is disturbing or annoying. The objectionable nature of sound could be caused by its pitch or its loudness. Pitch is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. Loudness is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. A decibel (dB) is a unit of measurement that indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 4.10-1.

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

Since the sensitivity to noise increases during the evening and at night, because excessive noise interferes with the ability to sleep, 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The Day/Night Average Sound Level (Ldn) is the average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 PM and 7:00 AM. The Community Noise Equivalent Level, (CNEL), is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 PM - 10:00 PM) and a 10 dB addition to nocturnal (10:00 PM - 7:00 AM) noise levels.

Table 4.10-1 Noise Technical Terms

Term	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this section are A-weighted, unless indicated otherwise.
L01, L10, L50, L90	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Equivalent Noise Level, Leq	The average A-weighted noise level during the measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 PM to 10:00 PM and after addition of 10 decibels to sound levels in the night between 10:00 PM and 7:00 AM.
Day/Night Noise Level, Ldn or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 PM and 7:00 AM.
Lmax, Lmin	The maximum and minimum A-weighted noise level during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Fundamentals of Groundborne Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several methods are typically used to quantify the amplitude of vibration including Peak Particle Velocity (PPV) and Root Mean Square (RMS) velocity. PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. RMS velocity is defined as the average of the squared amplitude of the signal, usually measured in decibels referenced to one micro-inches per second (in/sec) and reported in VdB. PPV and VdB vibration velocity amplitudes are used in this analysis to evaluate the effect on buildings and human response to vibration.

Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. This rattling phenomenon

may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows. In urban environments sources of groundborne vibration include construction activities, light and heavy rail transit, and heavy trucks and buses.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related groundborne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess groundborne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life are evaluated against different vibration limits. Studies have shown that the threshold of perception for average persons is in the range of 0.008 to 0.012 in/sec PPV. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as minor cracking of building elements, or may threaten the integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher and there is no general consensus as to what amount of vibration may pose a threat for structural damage to the building. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

Existing Noise Environment

The project is located within the communities of Samoa, Fairhaven, and Finntown (Figures 2-1 and 2-2). The primary noise source contributing to ambient conditions is traffic on New Navy Base Road. Periodic noise occurs from planes using the Samoa Field Airport; however, the airport is not considered a prominent source of noise in the area (Humboldt County 2017). There are no other major noise sources in the project area. Table 13-A (Inventory of Prominent Sources of Noise within Communities of Humboldt County) of the Humboldt County General Plan identifies the pulp mill, cogeneration plant, and shipping operations as stationary sources of noise in the project area (Humboldt County 2017). The cogeneration plant is located approximately 1,500 feet from the project, and the pulp mill is located adjacent to the proposed collection system alignment on Vance Avenue.

Noise-Sensitive Land Uses

Certain land uses, such as residences, schools, childcare centers, churches, hospitals, and nursing homes, etc. are generally more sensitive to noise impacts. Noise sensitive receptors in the project area include residential uses. Residential uses are located adjacent to the collection system alignment. Additionally, residential development is located approximately 1,000 feet from the Approved Samoa WWTF site.

4.10.2 Regulatory Framework

Federal

Federal Noise Control Act of 1972

The basic motivating legislation for noise control in the U.S. was provided by the Federal Noise Control Act (1972), which addressed the issue of noise as a threat to human health and welfare, particularly in urban areas. In response to the Noise Control Act, the U.S. Environmental Protection Agency (EPA) published Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (EPA 1974). In summary, EPA findings were that sleep, speech, and other types of essential activity interference could be avoided in residential areas if the L_{dn} did not exceed 55 dBA outdoors and 45 dBA indoors. The EPA intent was not that these findings necessarily be considered as mandatory standards, criteria, or regulatory goals, but as advisory exposure levels below which there is no reason to suspect that the general population would be at risk from any of the identified health or welfare effects of noise. The EPA Levels report also identified 5 dBA as an adequate margin of safety before an increase in noise level would produce a significant increase in the severity of community reaction (i.e., increased complaint frequency, annoyance percentages, etc.) provided that the existing baseline noise exposure did not exceed 55 dBA L_{dn}.

Table 4.10-2 provides examples of protective noise levels recommended by the EPA. The Occupational Safety and Health Administration (OSHA) regulations protect the hearing of workers exposed to occupational noise. Although responsibilities for regulating noise control policies have been transferred to local and state entities, the federal standards still provide value in the analysis of noise impacts.

Table 4.10-2 Recommended Noise Levels for the Protection of Public Health and Welfare

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

Source: EPA 1974:

Note dBA = A-weighted decibels
L_{dn} = day-night noise level
$L_{eq(24)}$ = energy-equivalent noise level over a 24-hour period.

State

No State regulations related to noise and vibration would be applicable to the project. However, Caltrans has published guidelines for evaluating potential vibration impacts from construction projects. Caltrans' Transportation and Construction Vibration Guidance Manual indicates that

vibration in excess of 0.3 in/sec PPV could cause cosmetic damage to structures, and 0.1 in/sec PPV could cause residential annoyance during sleep periods.

Regional and Local

At the local level, noise is addressed through the implementation of General Plan policies, including noise and land use compatibility guidelines, and through enforcement of a noise ordinance. General Plan policies provide guidelines for determining whether a noise environment is appropriate for a proposed or planned land use. Humboldt County does not have an adopted noise ordinance.

Humboldt County General Plan

The Humboldt County General Plan Noise Element includes a number of policies with regard to noise. The following policies are most applicable to the proposed project.

> **Policy N-P1. Minimize Noise from Stationary and Mobile Sources**. Minimize stationary noise sources and noise emanating from temporary activities by applying appropriate standards for average and short-term noise levels during permit review and subsequent monitoring.
>
> **Policy N-P4. Protection from Excessive Noise.** Protect persons from existing or future excessive levels of noise which interfere with sleep, communication, relaxation, health or legally permitted use of property.

The Humboldt County General Plan also provides the following standards applicable to the proposed project.

> **Policy N-S1. Land Use/Noise Compatibility Matrix.** The Land Use/Noise Compatibility Standards [Included in this EIR as Table 4.10-3] shall be used as a guide to ensure compatibility of land uses. Development may occur in areas identified as "normally unacceptable" if mitigation measures can reduce indoor noise levels to "Maximum Interior Noise Levels" and outdoor noise levels to the maximum "Normally Acceptable" value for the given Land Use Category.
>
> **Short-term Noise Performance Standards (Lmax).** The following noise standards, unless otherwise specifically indicated, shall apply to all property within their assigned noise zones and such standards shall constitute the maximum permissible noise level within the respective zones [Included in this EIR as Short-Term Noise Standards (Lmax)].
>
> **Exceptions.** The Short-Term Noise levels [included in this EIR as Table 4.10-4] shall not apply to uses such as, but not limited to:
>
> 1. Portable generator use in areas served by public electricity when electrical service is interrupted during emergencies as determined by the Planning Director.
> 2. Temporary events in conformance with an approved Conditional Use Permit.
> 3. Use of chainsaws for cutting firewood and power equipment used for landscape maintenance when accessory to permitted on-site uses.

4. Heavy equipment and power tools used during construction of permitted structures when conforming to the terms of the approved permit.
5. Emergency vehicles.

Table 4.10-3 Land Use/Noise Compatibility Standards

Land Use Category	Maximum Interior Exposure (Ldn1)	Land Use Interpretation for Ldn Value			
		Clearly Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential Single-Family, Duple, Mobile Homes	45	Under 55	55-60	60-75	Above 75
Residential- Multi-Family, Dormitories, etc.	45	Under 55	55-60	60-75	Above 75
Transient Lodging	45	Under 65	65-70	70-80	Above 80
School Classrooms, Libraries, Churches	45	Under 60	60-65	65-75	Above 75
Hospitals, Nursing Homes	45	Under 60	60-65	65-75	Above 75
Auditoriums, Concert Halls, Music Shells	35	Under 50	50-60	60-70	Above 70
Sports Arenas, Outdoor Spectator Sports	N/A	Under 60	60-65	65-75	Above 75
Playgrounds, Neighborhood Parks	N/A	Under 55	55-65	65-75	Above 75
Golf Courses, Riding Stables, Water Rec., Cemeteries	N/A	Under 60	60-70	70-80	Above 80
Office Buildings, Personal, Business, Professional	50	Under 65	65-75	75-80	Above 80
Commercial- Retail, Movie Theatres, Restaurants	50	Under 65	65-75	75-80	Above 80
Commercial- Wholesale, Some Retail, Ind. Mfg., Util.	N/A	Under 70	70-80	80-85	Above 85
Manufacturing Communications (Noise Sensitive)	N/A	Under 55	55-70	70-80	Above 80
Livestock Farming, Animal Breeding	N/A	Under 60	60-75	75-80	Above 80
Agriculture (except Livestock), Mining, Fishing	N/A	Under 75	Above 75	N/A	N/A
Public Right-of-Way	N/A	Under 75	75-85	Above 85	N/A
Extensive Natural Recreation Areas	N/A	Under 60	60-75	75-85	Above 85

Notes: N/A=Not Applicable
[1]. Due to Exterior Noise Levels
Source: Humboldt County 2017

Table 4.10-4 Short-Term Noise Standards (Lmax)

Zoning Classification	Day (maximum) 6:00 a.m. to 10:00 p.m. dBA	Night (maximum) 10:00 p.m. to 6:00 a.m. dBA
MG, MC, AE, TPZ, TC, AG, FP, FR, MH	80	70
CN, MB, ML, RRA, CG, CR, C-1, C-2, C-3	75	65
RM, R-3, R-4	65	60
RS, R-1, R-2, NR	65	60

Source: Humboldt County 2017

4.10.3 Evaluation Criteria and Thresholds of Significance

For the purpose of this EIR, the evaluation criteria and significance thresholds summarized below are used to determine if the project would have a significant effect related to noise. The following questions are from CEQA Guidelines' Appendix G Environmental Checklist. Would the project result in:

a. Exposure of persons to or generation of noise levels in excess of standards established in local general plan or noise ordinance, or applicable standards of other agencies?

   – Compliance with Humboldt County General Plan – Land Use Noise Compatibility Guidelines

b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

   – Exceeds 0.3 in/sec PPV (Caltrans Transportation and Construction Vibration Guidance Manual)

c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

   – Exceed applicable Humboldt County General Plan – Land Use Noise Compatibility Guidelines standard of 60 dBA

d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

   – Daytime - 60 dBA Leq and 5 dBA Leq or more above the ambient for a period greater than one year – (Standard industry practice)

e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

4.10.4 Methodology

The noise and vibration impact assessment evaluates noise and vibration impacts associated with construction and operation of the project. The assessment of potential noise impacts was conducted using the anticipated noise that would be produced during construction and operation of the project as compared to noise level thresholds established by the regulatory criteria. The assessment of

vibration impacts was conducted using information on anticipated vibration levels generated during construction of the project.

For construction noise, the potential for impacts was assessed by considering several factors, including the proximity of project-related noise sources to noise-sensitive land uses (i.e., sensitive receptors), typical noise levels associated with construction equipment, the potential for construction noise levels to interfere with daytime activities, and the duration that sensitive receptors would be affected. Construction-generated noise is exempted from the short-term noise level standards identified by the Humboldt County General Plan. Therefore, the short-term thresholds of 60 dBA Leq and 5 dBA Leq or more above the ambient for a period greater than one year is applied.

For operational noise, the potential for impacts was assessed by evaluating the noise generation potential of project noise sources, proximity of sensitive receptors, and the potential for operational noise to exceed the applicable land use noise compatibility standards provided by the Humboldt County General Plan and identified in Table 4.10-3. The nearest receptors are single-family residences located approximately 1,000 feet north of the Approved Samoa WWTF site. The applicable noise compatibility standard is 60 dBA.

The Caltrans guidelines for vibration are the basis for the significance criteria for annoyance and potential building damage. Caltrans recommends a vibration limit of 0.5 in/sec PPV for buildings structurally sound and designed to modern engineering standards, 0.3 in/sec PPV for buildings that are found to be structurally sound but where structural damage is a major concern, and a conservative limit of 0.08 in/sec PPV for ancient buildings or buildings that are documented to be structurally weakened. This analysis assumes that proposed construction areas would not be in the vicinity of fragile structures, but that older structures exist within the vicinity of the project sites. Based on Caltrans guidance, this analysis establishes 0.3 in/sec PPV as the significance threshold for construction vibration to avoid damage to buildings from vibration sources.

4.10.5 Impact Analysis

Impact NOI-1: **Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?**

This impact analysis addresses CEQA Guidelines Appendix G checklist item XII.a) identified in Section 4.10.3.

The Humboldt County General Plan identifies land use compatibility standards for all designated land uses within the county, as well as short-term noise standards (Humboldt County 2017). The maximum allowable acceptable noise standards for residential uses is 60 dBA. The applicable short-term noise standard for residential uses is 65 dBA between 6:00 a.m. and 10:00 p.m., unless the noise source qualifies for one of the exceptions, such as construction noise. Nighttime construction is not anticipated.

Construction

The construction phase of the project (approximately twelve months in duration) would require the use of heavy equipment for excavation, grading, etc., and would temporarily increase ambient noise levels for the duration of project

construction. Construction activities would also involve the use of smaller power tools, generators, and other sources of noise. During construction, noise levels would vary based on the amount of equipment in operation and the location of the activity in proximity to adjacent uses. Noise levels associated with the construction phase would be consistent with the reference noise levels in Table 4.10-5, Construction Equipment Reference Noise Levels Measures at 50 Feet, below.

Sound from a point source is known to attenuate, or reduce, at a rate of 6 dB for each doubling of distance. For example, a noise level of 84 dB Leq[1] as measured at 50 feet from the noise source would attenuate to 78 dB Leq at 100 feet from the source and to 72 dB Leq at 200 feet from the source to the receptor. Based on the reference noise levels below, the noise levels generated by construction equipment for the collection system, improvements to the Approved Samoa WWTF, and disposal system, may reach a maximum of approximately 85 dB Leq at 50 feet during site excavation, and construction. The County of Humboldt General Plan includes short-term noise standards for each of the land uses located within the county (Table 4.10-4); however, construction noise is exempt from these standards as long as construction conforms to the terms of the approved permit for the activity. Therefore, the project construction would not result in exposure of persons to, or generation of noise levels in excess of, standards established in the local general plan.

The project would have a **less than significant** impact during the construction phase of the project.

Table 4.10-5 Construction Equipment Reference Noise Levels Measured at 50 Feet

Equipment	Noise Level (dB)
Drill Rig Truck	84
Horizontal Boring, Hydraulic Jack	80
Front end Loader or Backhoe	80
Excavator	85
Jackhammer	85
Large Generator	82
Paver or Roller	85
Dump Truck	84

Operation

Operation of the project would consist of collection, treatment, and disposal of effluent through the project facilities, and maintenance of the project facilities. Pump stations located along the collection system would be located below

[1] Equivalent sound level (Leq) is a steady-state sound that has the same energy and A-weighted level as the community noise over a given time interval.

ground surface with an access hatch. The project's collection and disposal systems would be located underground and would not generate noise. The pump stations would also be located underground, and would generate some noise. With proper design, the noise levels would not exceed 60 dBA outside of the pump station. Pump station design is currently unknown; therefore, the impact is **significant**.

The project's proposed improvements to the Approved Samoa WWTF would be constructed within the footprint of the WWTF. The closest sensitive receptors to the Approved Samoa WWTF are located approximately 1,000 feet north within the Town of Samoa. The primary sources of operational noise would be occasional emergency generator testing and handling of treated solids and 4 haul trips per year for solids disposal. Although operation of the project improvements to the Approved Samoa WWTF may result in a slight increase in operational noise, it is not anticipated that the proposed additions would exceed the maximum acceptable threshold for residential uses of 60 dBA at the closest receptor, due to the type of activity and distance to the receptor.

Maintenance and employee trips would occur at a rate of approximately 1 trip per day and would not noticeably add to traffic that would cause an increase in the noise environment. The noise impact from maintenance and employees would be **less than significant**.

Summary

Construction noise is exempt from the county's short-term noise standards and, therefore, the construction activities associated with the project would not conflict with an applicable general plan policy. Operation of pump stations may generate **significant** levels of noise. All other noise associated with operation of the project is anticipated to attenuate below county standards at the nearest sensitive receptors or not alter the current noise environment due to their location underground or so minimal that it would not noticeably alter the current noise levels in the project area; the impact from other operations would have a **less than significant** impact related to exposing persons to or generating noise levels above the thresholds established in the Humboldt County General Plan.

Significance *Significant*

Mitigation **NOI-1: Noise Attenuation Design for Pump Stations**

The County shall require the each pump station design to include a demonstration that pump-generated noise would be attenuated to less than 60 dBA at the exterior of the pump station.

After Mitigation *Less Than Significant with Mitigation*

Implementation of Mitigation Measure NOI-1 includes a demonstration that pump station design would result in noise levels to be less than 60 dBA outside of the pump station; Mitigation Measure NOI-1 reduces the project's impact to **less than significant**.

Impact NOI-2: Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

This impact analysis addresses CEQA Guidelines Appendix G checklist item XII.b) identified in Section 4.10.3.

Construction

Construction of the proposed project would generally include site preparation, excavation/grading, trenching, and repaving. Major sources of groundborne vibration such as impact or vibratory pile drivers are not proposed as part of the project.

Table 4.10-6 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet. As indicated in Table 4.10-6, vibration levels produced by a vibratory roller can reach 0.210 in/sec, PPV at a distance of 25 feet. Jackhammers typically generate vibration levels of 0.035 in/sec PPV and drilling typically generates vibration levels of 0.09 in/sec PPV at a distance of 25 feet. Vibration levels would vary depending on soil conditions, construction methods, and equipment used.

Table 4.10-6 Vibration Source Levels for Project Construction Equipment

Equipment	PPV at 25' (in/sec)	Approximate Lv At 25' (VdB)
Vibratory Roller	0.201	94
Hoe Ram	0.089	87
Large Bulldozer	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79
Small Bulldozer	0.003	58

A review of the construction equipment list for the project was made to identify the specific pieces of construction equipment that would result in the highest vibration levels at nearby receptors. A vibratory roller would be used during the repaving phases of the project, and the nearest receptor would be located approximately 35 feet from portions of the collection system that would be repaved. At a distance of 35 feet, vibration levels produced by a vibratory roller would be below the 0.3 in/sec PPV threshold used to avoid cosmetic damage to buildings that are found to be structurally sound but where structural damage is a major concern. Vibration levels produced by other equipment proposed as part of the project and at locations further from receptors, such as the approved Samoa WWTF, would also be less than the 0.3 in/sec PPV threshold. The impact from vibration during construction would be **less than significant**.

Operation

It is not anticipated that the project would utilize any equipment during that operational phase that would generate excessive groundborne vibration or

groundborne noise levels. Therefore, **no impact** would occur during the operational phase.

Summary

During the construction phase the project would utilize certain equipment that could result in generation of groundborne vibration; however, it is anticipated that the levels of vibration at the closest sensitive receptor would be below the threshold. Therefore, a **less than significant** impact would occur during the construction phase. No groundborne vibration is anticipated to be generated during the operational phase. Therefore, **no impact** would occur during project operations.

Significance *Less than Significant*

Mitigation **None Required**

Impact NOI-3: **Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?**

This impact analysis addresses CEQA Guidelines Appendix G checklist item XII.c) identified in Section 4.10.3.

Construction

Construction of the proposed project would be temporary, lasting approximately twelve months. Therefore, the construction phase would not result in a permanent increase in ambient noise levels and the impact would be **less than significant**.

Operation

The project's sewer lines would be located underground and would not generate noise, and the weekly maintenance trip is not anticipated to increase the noise environment above the existing ambient conditions. The pump stations would also be located underground, and would generate some noise. With proper design, the noise levels would not exceed 60 dBA outside of the pump station. Pump station design is currently unknown; therefore, the impact is **significant**.

The nearest sensitive receptor is located approximately 1,000 feet away from the Approved Samoa WWTF. Improvements to the Approved Samoa WWTF include SBR basins, UV disinfection reaction chambers, a dewatering basin, and solids drying beds. These improvements are not sources of substantial noise. The main source of noise from operation of improvements at the Approved Samoa WWTF would be from use of a front end loader or backhoe during loading of treated solids approximately 4 times per year. Noise from the proposed improvements are anticipated to be below the threshold of 60 dBA as measured at the nearest residential receptor, and would not result in a substantial permanent increase in ambient noise levels in the project vicinity. Therefore, the proposed project would not substantially increase the ambient noise environment above the levels existing without the project. The impact is **less than significant**.

Summary

The construction phase of the project would be temporary and therefore would not result in a permanent increase in the ambient noise environment. Construction phase impact would be **less than significant**. Project operations include use of subterranean pump stations that may generate substantial noise; this impact is **significant**. Project operation at the Approved Samoa WWTF site could result in new noise sources; however, the closest sensitive receptor is located approximately 1,000 feet away and operational noise would attenuate below the residential threshold and not noticeable to the existing residents. Therefore, the project operations at the Approved Samoa WWTF would be **less than significant**.

Significance *Significant*

Mitigation **NOI-1: Noise Attenuation Design for Pump Stations**

Refer to Impact NOI-1 above for the full text of Mitigation Measure NOI-1: Noise Attenuation Design for Pump Stations.

After Mitigation *Less Than Significant with Mitigation*

Implementation of Mitigation Measure NOI-1 includes a demonstration that pump station design would result in noise levels to be less than 60 dBA outside of the pump station; Mitigation Measure NOI-1 reduces the project's impact to **less than significant**.

Impact NOI-4: **Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?**

This impact analysis addresses CEQA Guidelines Appendix G checklist item XII.d) identified in Section 4.10.3.

Construction

Project-related construction activities would result in temporary noise increases at sensitive receptors located throughout the collection system alignment. Construction noise levels would vary at any given receptor depending on the type of construction activity, construction phase, equipment type and duration of use, distance between the noise source and receptor, and the presence or absence of barriers between the noise source and receptor. Typical construction equipment generates noise levels ranging from about 76 to 88 dBA at a distance of 50 feet from the source, with higher levels of about 86 to 98 dBA for certain types of earthmoving and impact equipment (e.g., jack hammers, pavement breakers, rock drills). The rate of attenuation or reduction is about 6 dBA for every doubling of distance from a point source. Table 4.10-5 lists noise levels for typical construction equipment at 50 feet from the noise source.

Calculations made based on a review of the proposed construction equipment list indicates that hourly average noise levels would range from approximately 80

to 85 dBA Leq at a distance of 50 feet from the center of any particular active construction location during busy construction periods.

Construction-phase noise generation would occur for pipeline installation, street restoration, staging, pump station installation, and improvements made to the Approved Samoa WWTF. Daytime construction noise levels (there is no construction planned during evening hours) are calculated to exceed the 60 dBA L_{max} threshold at receptors within close proximity to project construction activities. Although construction activities would extend for approximately 12 months overall, exposure to any one sensitive receptor would be for a shorter duration. For example, pipeline construction is conservative expected to progress at about 50 to 100 feet per day and construction of improvements at the Approved Samoa WWTF would last only 6 months. Although construction would result in a temporary increase in ambient noise levels in the immediate project vicinity, the exposure from daytime construction noise would be limited, and less than 12 months, and is not considered substantial. The impact would be **less than significant** recognizing the relatively short-duration of the proposed construction activities.

Operation

The majority of the project facilities would be located underground and therefore would not noticeably alter the noise environment. Occasional maintenance trips and haul trips would occur; however, due to the existing traffic within the project area this is not anticipated to contribute substantially increase the noise environment.

During operation of the project, temporary sources of noise include periodic testing of back-up generators and use of a front end loader or backhoe to load treated solids approximately 4 times per year. The project's improvements to the Approved Samoa WWTF facilities would be located within the WWTF footprint. As the facility would be located at minimum 1,000 feet away from the nearest sensitive receptors, the project would not result in a substantial temporary or periodic increase in the ambient noise environment as the improvements would be consistent with the facilities included in the Approved Samoa WWTF and would not noticeably alter the existing ambient conditions. A **less than significant** impact would occur.

Summary

Project construction would utilize equipment that would temporarily increase the ambient noise environment. However, due to the short-term nature of the activity and the fact that construction would be completed within twelve months, the temporary increase would not be considered substantial and a **less than significant** impact would occur. During operation, the intermittent maintenance trips and haul trips would not contribute substantially to the noise environment given the existing traffic located within the project area. Additionally, the proposed project facilities may contribute to the existing ambient environment; however, the closest sensitive noise receptors are located approximately 1,000 feet away from the Approved WWTF site and, therefore, it is assumed that noise would

attenuate below a noticeable level. Therefore, the project would have a **less than significant** impact during the operational phase.

Significance *Less than Significant*

Mitigation **None Required**

Impact NOI-5: **Would the project be located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, and expose people residing or working in the project area to excessive noise levels?**

This impact analysis addresses CEQA Guidelines Appendix G checklist item XII.e) identified in Section 4.10.3.

The proposed project is located in close proximity to the Samoa Field Airport, which is owned by the City of Eureka and located off of New Navy Base Road, southwest of Fairhaven. However, the proposed project does not include the construction of residences and would not expose people to excessive noise from Samoa Field Airport. Therefore, **no impact** would occur.

Significance *No Impact*

Mitigation **None Required**

Impact NOI-6: **Would the project be located within the vicinity of a private airstrip, and expose people residing or working in the project area to excessive noise levels?**

This impact analysis addresses CEQA Guidelines Appendix G checklist item XII.f) identified in Section 4.10.3.

The proposed project is not located within the vicinity of a private airstrip; therefore, **no impact** would occur.

Significance *No Impact*

Mitigation **None Required**

4.10.6 Cumulative Impacts

Impact NOI-C-1: **Would the project contribute to cumulatively considerable noise impacts?**

For noise and vibration, the geographic scope of potential cumulative impacts is limited to the immediate project vicinity as well as areas adjacent to any routes designated for access and hauling. A cumulative noise impact would only occur if noise sources from two (or more) projects occurred at the same time in the same general area, and if they contributed to an increase in ambient noise levels above county standards.

Construction

Regarding noise from construction, the cumulative analysis of impacts is limited to the time when the construction activities occur and the proximity of other

projects that are under construction or other sources of noise in the immediate vicinity of proposed project construction activities. Construction impacts do not occur once construction has ceased. There are four projects located within the immediate vicinity of the project; however, only one is anticipated to occur during construction of the proposed project. The Approved Samoa WWTF would be constructed in 2020, same as the proposed project. Therefore, there is potential for a cumulative noise impact in the immediate vicinity of the project at the Approved Samoa WWTF site. However, as discussed above under Impact NOI-1, the nearest sensitive receptor to the Approved Samoa WWTF are located approximately 1,000 feet away; therefore, construction noise is anticipated to attenuate below noticeable levels. Therefore, noise impacts would not be considered cumulatively considerable.

Vibration impacts are often associated with construction activities. Reasonably foreseeable future projects could contribute to a cumulatively significant impact but only if located in proximity to the project site. Construction of the Approved Samoa WWTF is the only project within the vicinity that has the potential to occur during the construction phase. However, due to the distance to the nearest receptor and the fact that the project would not generate a significant amount of vibration, it is unlikely that this would result in a cumulatively considerable effect associated with vibration. Therefore, vibration impacts would not be considered cumulatively considerable.

Operation

Regarding noise from operations, the proposed project's individual impact would be less than significant. The Approved Samoa WWTF would operate similarly to the proposed project and is not anticipated to significantly increase noise in the vicinity above the current noise environment. There are no known past, present, or reasonably foreseeable future projects in the immediate vicinity of the Approved Samoa WWTF which would contribute to a cumulatively considerable noise impact. The other components of the project would generally be located underground and are therefore not expected to contribute substantially to a cumulatively considerable operational impact.

Significance *Less than Cumulatively Considerable (Less than Significant)*

Mitigation **None Required**

4.10.7 References

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Environmental Protection Agency. 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare within an Adequate Margin of Safety. March.

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