3.11 Noise

This section of the Draft EIR evaluates potential impacts to/regarding noise and vibration associated with implementation of the proposed Golden State Natural Resources Forest Resiliency Demonstration Project (proposed project). This section describes the existing noise conditions at feedstock source locations (Sustainable Forest Management Projects), proposed pellet processing facility sites in Northern California (Lassen Facility) and the Central Sierra Nevada foothills (Tuolumne Facility), and the export terminal in Stockton, California (Port of Stockton), and evaluates the potential for project-related noise and vibration impacts, considering proposed project design features that could reduce or eliminate associated impacts. Some scoping comments were received regarding noise and vibration in response to the Notice of Preparation (NOP) (see Appendix A).

3.11.1 Setting

3.11.1.1 Noise Background, Terminology and Existing Conditions

Fundamentals of Environmental Noise

Vibrations, traveling as waves through air from a source, exert a force perceived by the human ear as sound. Sound pressure level (referred to as sound level) is measured on a logarithmic scale in decibels (dB) that represents the fluctuation of air pressure above and below atmospheric pressure. Frequency, or pitch, is a physical characteristic of sound separate from sound level and is expressed in units of cycles per second or hertz. The normal frequency range of hearing for most people extends from about 20 to 20,000 hertz. The human ear is more sensitive to middle and high frequencies, especially when the noise levels are quieter. As noise levels get louder, the human ear starts to hear the frequency spectrum more evenly. To accommodate for this phenomenon, a weighting system was developed to evaluate how loud a noise level is perceived by humans. The frequency weighting, called "A" weighting, is typically used for quieter noise levels, which de-emphasizes the low-frequency components of the sound in a manner similar to the response of a human ear. This A-weighted sound level is called the "noise level" and is referenced in units of A-weighted decibels (dBA). Table 3.11-1 presents typical noise levels for common outdoor and indoor activities.

Sound is measured on a logarithmic scale; a doubling of sound energy results in a 3-dBA increase in the noise level. However, changes in a community noise level of less than 3 dBA are not typically noticed by the human ear (Caltrans 2020a). Changes from 3 to 5 dBA may be noticed by some individuals who are extremely sensitive to changes in noise. A 5-dBA increase is readily noticeable (EPA 1974). The human ear perceives a 10-dBA increase in sound level as a doubling of the sound level (*e.g.*, 65 dBA sounds twice as loud as 55 dBA to a human ear).

An individual's noise exposure occurs over a period of time; however, noise level is a measure of noise at a given instant in time. Community noise sources vary continuously, being the product of many noise sources at various distances, all of which constitute a relatively stable background or ambient noise environment. The background, or ambient, noise level gradually changes throughout a typical day, corresponding to distant noise sources such as traffic volume and changes in atmospheric conditions. The time-varying character of environmental noise is often described with use of statistical or percentile noise descriptors including L_{10}, L_{50}, and L_{90}. These are the noise levels equaled or exceeded during 10 percent, 50 percent, and 90 percent of the measured time interval. Sound levels associated with L_{10} typically describe transient or short-term events, such as the noise from distinct passing cars and trucks, measured from a position near a low-traffic roadway. L_{50} represents the median sound level during the measurement interval. Levels will be above and below this value exactly one-half of the accumulated measurement

time. L_{90} is the sound level exceeded 90 percent of the time, and often is used to describe background noise conditions or sources that are continuous or "steady-state" in character.

Table 3.11-1. Typical Noise Levels Associated with Common Activities

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet Flyover at 1,000 feet	105	
	100	
Gas Lawn Mower at three feet	95	
	90	
Diesel Truck at 50 feet, 50 miles per hour	85	Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noisy Urban Area, Daytime	75	
	70	Vacuum Cleaner at 10 feet
Commercial Area	65	Normal speech at 3 feet
Heavy Traffic at 300 feet	60	
	55	Large Business Office
Quiet Urban Daytime	50	Dishwasher (in next room)
	45	
Quiet Urban Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Nighttime	35	
	30	Library
Quiet Rural Nighttime	25	Bedroom at Night, Concert Hall (background)
	20	
	15	Broadcast/Recording Studio
	10	
	5	
Lowest Threshold of Human Hearing (Healthy)	0	Lowest Threshold of Human Hearing (Healthy)

Source: Caltrans 2020a.
Notes: dBA = A-weighted decibel; mph = miles per hour.

Noise levels are generally higher during the daytime and early evening when traffic (including aircraft), commercial, and industrial activity is the greatest. As such, noise sources experienced during nighttime hours when background levels are generally lower can be potentially more conspicuous and irritating to the perceiver. To evaluate noise in a way that considers periodic fluctuations experienced throughout the day and night, a concept termed "community noise equivalent level" (CNEL) was developed, wherein noise measurements are weighted, added, and averaged over a 24-hour period to reflect magnitude, duration, frequency, and time of occurrence.

Different types of measurements are used to characterize the time-varying nature of sound. These measurements include the equivalent sound level (L_{eq}), the minimum and maximum sound levels (L_{min} and L_{max}, respectively),

percentile-exceeded sound level (L_{xx}), the day-night sound level (L_{dn}), and the CNEL. The following list provides brief definitions of noise terminology used in this section.

- **Decibel** (dB) is a unitless measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micropascals.
- **A-weighted decibel** (dBA) is an overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
- **Equivalent sound level** (L_{eq}) is the constant level that, over a given time period, transmits the same amount of acoustic energy as the actual time-varying sound. Equivalent sound levels are the basis for both the L_{dn} and CNEL scales.
- **Maximum sound level** (L_{max}) is the maximum sound level measured during the measurement period.
- **Minimum sound level** (L_{min}) is the minimum sound level measured during the measurement period.
- **Percentile-exceeded sound level** (L_{xx}) is the sound level exceeded X% of a specific time period. L_{10} is the sound level exceeded 10% of the time.
- **Day-Night Average Sound Level** (L_{dn}) is a 24-hour average A-weighted sound level with a 10 dB penalty added each of the hourly average noise levels occurring in the nighttime hours from 10:00 p.m. to 7:00 a.m. The 10 dB penalty is applied to account for increased noise sensitivity during the nighttime hours.
- **Community Noise Equivalent Level** (CNEL) is the average equivalent A-weighted sound level during a 24-hour day. CNEL accounts for the increased noise sensitivity during the evening hours (7:00 p.m. to 10:00 p.m.) and nighttime hours (10:00 p.m. to 7:00 a.m.) by adding 5 dB to the recorded hourly average sound levels in the evening and 10 dB to the hourly average sound levels at night.

Exterior Noise Attenuation

Noise sources are classified in two forms: (1) point sources, such as stationary equipment or a group of construction vehicles and equipment working within a spatially limited area at a given time; and (2) line sources, such as a roadway with a large number of pass-by sources (motor vehicles). Sound generated by a point source typically diminishes (attenuates) at a rate of 6.0 dBA for each doubling of distance from the source to the receptor at acoustically "hard" sites and at a rate of 7.5 dBA for each doubling of distance from source to receptor at acoustically "soft" sites (Caltrans 2020a). Sound generated by a line source (i.e., a roadway) typically attenuates at a rate of 3 dBA and 4.5 dBA per doubling distance, for hard and soft sites, respectively (Caltrans 2020a). Sound levels can also be attenuated by human-made or natural barriers. For the purpose of a sound attenuation discussion, a hard or reflective site does not provide any excess ground-effect attenuation and is characteristic of asphalt or concrete ground surfaces, as well as very hard-packed soils. An acoustically soft or absorptive site is characteristic of unpaved loose soil or vegetated ground.

Here is an example of this distance-attenuation relationship for exterior noise: a 60-dBA noise level measured at 50 feet from a tractor installing fenceposts within a packed earth feedlot site would diminish to 54 dBA at 100 feet from the source, and to 48 dBA at 200 feet from the source. This scenario is governed by the point source attenuation for a hard site (6 dBA with each doubling of the distance). For the scenario where soft-site conditions exist between the point source and receptor, represented by natural vegetation, planted row crops, or plowed furrows adjacent to the work area, an attenuation rate of 7.5 dBA per doubling of distance would apply; the tractor noise measured as 60 dBA at 50 feet would diminish to 52.5 dBA at 100 feet from the source and to 45 dBA at 200 feet from the source, where soft ground exists between the sound source and the receptor location.

Structural Noise Attenuation

Sound levels can also be attenuated by human-made or natural barriers. Solid walls, berms, or elevation differences typically reduce noise levels in the range of approximately 5 to 15 dBA (Caltrans 2020a). Structures can also provide noise reduction by insulating interior spaces from outdoor noise. The outside-to-inside noise attenuation provided by typical structures is approximately 10 dB with open windows, as shown in Table 3.11-2 (FHWA 2011).

Table 3.11-2. Building Noise Reduction Factors

Building Type	Window Condition	Noise Reduction Due to Exterior of the Structure
All	Open	10 dB

Source: FHWA 2011.
Notes: dB = decibel.

Fundamentals of Vibration

Vibration is an oscillatory motion that can be described in terms of displacement, velocity, or acceleration. Heavy equipment operation, including stationary equipment that produces substantial oscillation or construction equipment that causes percussive action against the ground surface, may be experienced by building occupants as perceptible vibration. It is also common for groundborne vibration to cause windows, pictures on walls, or items on shelves to rattle. Although the perceived vibration from such equipment operation can be bothersome to building occupants, the vibration is seldom of sufficient magnitude to cause even minor cosmetic damage to buildings.

Peak particle velocity (PPV) describes particle movement over time (in terms of physical displacement of mass, expressed as inches/second or in/sec) and is generally employed for the discussion of vibration impacts on people and structures. Groundborne vibration generated by construction projects is usually highest during pile driving, rock blasting, soil compacting, jack hammering, and demolition-related activities. Next to pile driving and soil compacting, grading activity has the greatest potential for vibration impacts when earthwork involves large bulldozers, large trucks, or other heavy equipment.

Health Effects of Noise

Noise is known to have a number of different adverse effects on humans. Based upon these recognized adverse effects of noise, criteria have been established to help protect the public health and safety and prevent disruption of certain human activities. These criteria are based on effects of noise on people such as hearing loss (not generally associated with community noise), communication interference, sleep interference, physiological responses, and annoyance (EPA 1974).

3.11.1.2 Sustainable Forest Management Projects

Feedstock destined to the Lassen and Tuolumne facilities for manufacturing of wood pellets will be wood byproducts sourced from Sustainable Forest Management Projects such as hazardous fuel reduction projects, construction of shaded fuel breaks, and salvage harvests (see Chapter 2, Project Description, for a full description). The feedstock would originate from private, state, tribal, and federal timberlands located within the Working Area of the proposed facilities.

3.11.1.3 Northern California (Lassen Facility) Site

Location

The proposed Lassen wood pellet processing site is located in Nubieber, California (Lassen County), approximately 3 miles southwest of the census-designated place of Bieber in northwestern Lassen County (see Figure 2-3, Project Location (Lassen)). The Lassen site is located at 653-800 Washington Avenue, Nubieber, California. The production facilities would be located on a parcel approximately 65 acres in size, Assessor's Parcel Number (APN) 001-270-086. Log decking (storage) would occur on approximately 51 acres of the ~225-acre property immediately south of the production site (APNs 001-270-26, 001-270-29, and 013-040-13) (the "woodyard"). The project site is situated in Township 38 North, Range 7 East, and Sections 28 and 33 of the U.S. Geological Survey Bieber, California 7.5-minute quadrangle. Elevation on the Lassen site is approximately 4,120 feet above mean sea level.

The Lassen location includes a northerly parcel, formerly part of a wood processing sawmill, and a southerly parcel vacant agricultural parcel. The buildings from the prior sawmill use are located north of the project site, and were separated from the main parcel through a lot line adjustment. The Burlington Northern Sante Fe (BNSF) Railroad forms the eastern boundary of the site. An agricultural chemical company (Helena Agri-Business) and scattered residences are located to the north and west of the site, and to the east of the woodyard property. Agricultural land is located to the east and south. Most of the lands adjacent to the site are under Williamson Act contracts. Primary access to the site is from Babcock Road, which connects to State Route 299.

Existing Conditions

The Lassen site is shown in Figure 2-4, Project Site (Lassen). The northerly parcel (APN 001-270-086) was previously part of a sawmill operation, and was also used to load logs and wood products onto railcars. The parcel includes railroad siding, a gravel pad, internal roadways, a well pump house and water tower. The water tower is 102 feet tall. A rail spur crosses the project site to provide rail access to the property to the west.

The majority of the undeveloped areas of the project site consist of non-native grassland with a mix of annual grasses and forbs.

The production facility parcel contains one seasonal wetland and one seasonal wetland swale located in the southeastern portion of the parcel. These features collect water seasonally and are discernible from the adjacent upland areas by a distinct change in vegetation. The five upland ditches located throughout the project site are unlined, earthen water conveyance systems that were constructed in upland habitat and exhibit a mild break in slope and change in vegetation. Ditches within the project site are generally 5 to 6 feet wide at the top of bank and have an ordinary high water mark width of 1 to 2 feet.

The majority of the project site, including the production facility, is located within a 100-year floodplain. Therefore, finished grade of structures would need to be above base flood elevation.

The northerly production facility parcel is zoned A-1 (General Agriculture District), which is described in Chapter 18.16 of the Lassen County Ordinance Code and is classified as Town Center by the Lassen County General Plan (Lassen County 1999). The southerly woodyard property is zoned E-A-A-P (Exclusive Agricultural District – Agricultural Preserve Combining District), described in Chapters 18.66 and 18.82 of the Lassen County Ordinance Code, and is classified as Intensive Agriculture by the General Plan.

Measured Outdoor Ambient Sound

Field measurements of sound pressure level (SPL) were conducted near the Lassen site on June 22nd, 2023, to quantify and characterize the existing outdoor ambient sound levels. Table 3.11-3 provides the location, date, and time period at which these baseline noise level measurements were performed by an attending Dudek field investigator using a Soft dB-branded Piccolo II sound level meter (SLM) equipped with a 0.5-inch, pre-polarized condenser microphone with pre- amplifier. The SLM meets the current American National Standards Institute standard for a Type 2 sound level meter. The accuracy of the SLM was verified using a field calibrator before and after the measurements, and the measurements were conducted with the microphone positioned approximately 5 feet above the ground.

Three (3) short-term (ST) noise level measurement locations (ST6–ST8) that represent existing noise-sensitive receivers were selected on and near the proposed project site. The measured L_{eq} and L_{max} noise levels recorded at the ST locations are provided in Table 3.11-3 and ranged from approximately 40.6 dBA L_{eq} at ST6 to 49.5 dBA L_{eq} at ST8. Beyond the summarized information presented in Table 3.11-3, detailed noise measurement data is included in Appendix H1, Baseline Noise Measurement Field Data.

Table 3.11-3. Lassen Facility – Measured Baseline Outdoor Ambient Noise Levels

Site	Location/Address	Date/Time	L_{eq} (dBA)	L_{max} (dBA)
ST6	Northern property boundary	2023-06-22, 1:03 PM to 1:28 PM	40.6	41.7
ST7	Northwestern property boundary	2023-06-22, 1:05 PM to 1:36 PM	42.4	45.8
ST8	Northern property boundary	2023-06-22, 1:32 PM to 1:57 PM	49.5	50.2

Source: Appendix H1.

3.11.1.4 Central Sierra Nevada (Tuolumne Facility) Site

Location

The proposed Tuolumne wood pellet processing site is located at 12001 La Grange Road approximately 9 miles southwest of the community of Jamestown, in Tuolumne County, California, and in the western foothills of the Sierra Nevada Mountain Range (see Figure 2-7, Project Location (Tuolumne)). The Tuolumne site is located immediately southeast of the junction of State Route 108 and La Grange Road. The site is situated in Township 1 South, Range 13 East, and Sections 14 and 23 of the U.S. Geological Survey Tuolumne, California 7.5-minute quadrangle. Elevations on the Tuolumne site range from approximately 1,070 feet above mean sea level in the northwest corner of the site to 1,140 feet above mean sea level in the eastern portion of the site. The Tuolumne site occurs within the Upper Stanislaus River watershed.

The Tuolumne location is a previously developed site that was formerly a wood processing mill, used by the former owner, Sierra Pacific Industries, for finished bark and colored mulch processing. Prior to Sierra Pacific Industries ownership, the facility was an operational sawmill run by Louisiana Pacific. A wood shaving plant owned by American Wood Fibers is located adjacent to the west side of the site, and two residences are located adjacent to the northwest corner of the site. Agricultural land is located to the north, east, and south. A majority of the adjacent lands are under Williamson Act (California Land Conversation Act) contracts, restricting them to agricultural or

related use. Primary access to the site is from La Grange Road, which connects to CA-120 northwest of the site. The site is bordered by Sierra Northern Railroad to the west that travels along La Grange Road and intersects near the southwestern project site boundary.

Existing Conditions

The Tuolumne site is partially developed with existing structures and other features generally concentrated within the center of the site, as shown in Figure 2-8, Project Site (Tuolumne). This includes buildings, stockpiling and staging areas, paved and gravel roadways, gravel lots, and other features associated with the abandoned mill. Currently, 9.6 acres of the total 58.56 acres of the project site are paved. The site has two existing accessways: one for truck access at the southwest area of the site and one that would be improved and used for employee access at the northwest area of the site, both from La Grange Road.

The project site contains a variety of aquatic resources, including wetland and non-wetland waters. There are two freshwater emergent wetlands and two seasonal wetlands located in the northern and southern portions of the site. These features are discernible from the adjacent upland areas by a distinct change in vegetation. There is one vernal pool in the southeastern corner of the project site. An ephemeral drainage at the southern edge of the project site conveys overflow from a vernal pool and directs it through a culvert south of the project site. A freshwater pond in the northern portion of the project site is fed by two seasonal drainages originating east to northeast of the project site. Additionally, there are four humanmade detention basins constructed throughout the project site to collect and store run-off: one in the southern portion of the site, one in the northeastern portion of the site, and two located near the mid-west portion of the site. One perennial drainage is located near the southern portion of the project site, and one intermittent drainage occurs in the northeast corner of the project site.

Such geographic conditions suggest that for purposes of outdoor sound propagation modeling the vicinity topography is essentially flat (i.e., no obvious natural terrain barriers to interfere with project site sound sources and the nearest offsite surrounding noise-sensitive receptors. Additionally, the preceding description indicates that the ground cover of the project site would tend to be—on average but varying somewhat with the degree of surface water—fairly good with respect to acoustical absorption.

The current 58.56-acre site was once part of a larger mill site that included the 8.39-acre parcel to the southwest and two smaller (1.48-acre and 1.43-acre) parcels to the northwest. A wood shavings plant was constructed on the 8.39-acre parcel adjacent to the southwest under a Site Development Permit (307) granted in 1990. This wood shavings plant is now owned and operated by American Wood Fibers. The two smaller parcels each contain a single-family residence, built in 1969 as caretaker housing for the mill, and have since been sold for residential housing.

The site is zoned M-2 (Heavy Industrial), which is described in Section 17.40.020 of the Tuolumne County Ordinance Code and is classified as Heavy Industrial by the Tuolumne County General Plan (Tuolumne County 2018).

Measured Outdoor Ambient Sound

Field measurements of sound pressure level (SPL) were conducted near the Tuolumne site on June 20th, 2023, to quantify and characterize the existing outdoor ambient sound levels. Table 3.11-4 provides the location, date, and time period at which these baseline noise level measurements were performed by an attending Dudek field investigator using a Soft dB-branded Piccolo II sound level meter (SLM) equipped with a 0.5-inch, pre-polarized condenser microphone with pre- amplifier. The SLM meets the current American National Standards Institute standard for a Type 2 sound level meter. The accuracy of the SLM was verified using a field calibrator before and after

the measurements, and the measurements were conducted with the microphone positioned approximately 5 feet above the ground.

Two (2) short-term (ST) noise level measurement locations (ST1–ST2) that represent existing noise-sensitive receivers were selected on and near the proposed project site. The measured L_{eq} and L_{max} noise levels recorded at the ST locations are provided in Table 3.11-4 and ranged from approximately 59.9 dBA L_{eq} at ST1 to 66.1 dBA L_{eq} at ST2. Beyond the summarized information presented in Table 3.11-4, detailed noise measurement data is included in Appendix H1, Baseline Noise Measurement Field Data.

Table 3.11-4. Tuolumne Facility – Measured Baseline Outdoor Ambient Noise Levels

Site	Location/Address	Date/Time	L_{eq} (dBA)	L_{max} (dBA)
ST1	Northwestern property boundary	2023-06-20, 10:26 AM to 10:36 AM	59.9	66.9
ST2	CAL FIRE Green Springs Station	2023-06-20, 10:54 AM to 11:09 AM	66.1	77.1

Source: Appendix H1.

3.11.1.5 Port of Stockton

Location

Finished pellets would be transported by rail from both the Lassen and Tuolumne facilities to the Port of Stockton, California (see Figure 2-10, Port Location). The proposed GSNR facility would be located in the West Complex of the Port, formerly known as Rough and Ready Island.

Existing Conditions

The Port of Stockton is an active deep-water port. In 2019, Port activity included 234 ship calls and 4.4 million tons of import and export cargo. The West Complex, also known as Rough and Ready Island, is a former naval communication station (and previously, a naval supply annex). The property was approved for transfer to the Port of Stockton in 1966 for the benefit of maritime trade. The property was transferred in 2000.

The West Complex is 1,459 acres in size. It has 7 berths (labeled 14 through 20), with 6000 linear feet of docks, 630,000 square feet of transit sheds, and approximately 5 million square feet in warehouse space. Surface access to the West Complex is provided by Navy Drive Bridge and a parallel rail bridge on the west side, connecting to the main port, and the Port of Stockton Expressway Bridge to the south – the Expressway ultimately connects to Highway 4. The proposed GSNR facility would be located in the northwest quarter of the West Complex, on a relatively undeveloped site bordered by Davis Ave., Boone Dr., Edwards Ave., and Lipes Dr. The project site include a concrete parking lot in the southeast corner.

Measured Outdoor Ambient Sound

Field measurements of sound pressure level (SPL) were conducted near the Port of Stockton site on June 20th, 2023, to quantify and characterize the existing outdoor ambient sound levels. Table 3.11-5 provides the location, date, and time period at which these baseline noise level measurements were performed by an attending Dudek field investigator using a Soft dB-branded Piccolo II sound level meter (SLM) equipped with a 0.5-inch, pre-polarized condenser microphone with pre- amplifier. The SLM meets the current American National

Standards Institute standard for a Type 2 sound level meter. The accuracy of the SLM was verified using a field calibrator before and after the measurements, and the measurements were conducted with the microphone positioned approximately 5 feet above the ground.

Three (3) short-term (ST) noise level measurement locations (ST3–ST5) that represent existing noise-sensitive receivers were selected near the proposed project site. The measured L_{eq} and L_{max} noise levels recorded at the ST locations are provided in Table 3.11-5 and ranged from approximately 49.9 dBA L_{eq} at ST5 to 60.9 dBA L_{eq} at ST4. Beyond the summarized information presented in Table 3.11-5, detailed noise measurement data is included in Appendix H1, Baseline Noise Measurement Field Data.

Table 3.11-5. Port of Stockton Facility – Measured Baseline Outdoor Ambient Noise Levels

Site	Location/Address	Date/Time	L_{eq} (dBA)	L_{max} (dBA)
ST3	Southeast of property boundary	2023-06-20, 12:33 PM to 12:53 PM	58.7	63.8
ST4	East of property boundary	2023-06-20, 1:13 PM to 1:28 PM	60.9	67.2
ST5	Northeast of property boundary	2023-06-20, 1:41 PM to 1:55 PM	49.9	54.3

Source: Appendix H1.

3.11.2 Regulatory Setting

3.11.2.1 Federal

Department of Agriculture, U.S. Forest Service (USFS)

California contains land that is managed by the United States Forest Service (USFS), which is an agency within the United States Department of Agriculture (USDA). The USFS is subject to regulations established in Title 36 (Parks, Forests, and Public Property) of the CFR. 36 CFR 261 Subpart A contains a broad discussion of prohibitions applicable to acts and omissions occurring in the National Forest System or on a National Forest System road or trail, as well as property administered by the USFS. 36 CFR 261 Subpart B describes the process by which the Chief, each Regional Forester, each Experiment Station Director, the Administrator of the Lake Tahoe Basin Management Unit, and each Forest Supervisor may issue orders which close or restrict the use of described areas within the area over which they have jurisdiction. Lastly, 36 CFR 261 Subpart C provides for issuance of regulations by the Chief, and each Regional Forester to whom the Chief has delegated authority, prohibiting acts or omissions within all or any part of the area over which they have jurisdiction. The CFR criteria applicable to the project activities carried out on land administered by the USFS are provided below:

> 36 CFR 261.10 – Occupancy and use.
>
> The following are prohibited:
>
> (i) Operating or using in or near a campsite, developed recreation site, or over an adjacent body of water without a permit, any device which produces noise, such as a radio, television, musical

instrument, motor or engine in such manner and at such a time so as to unreasonably disturb any person.

(k) Use or occupancy of National Forest System land or facilities without special-use authorization when such authorization is required.

(l) Violating any term or condition of a special-use authorization, contract or approved operating plan.

(p) Use or occupancy of National Forest System lands or facilities without an approved operating plan when such authorization is required.

Federal Transit Administration (FTA)

In its Transit Noise and Vibration Impact Assessment guidance manual, the Federal Transit Administration (FTA) recommends a daytime construction noise level threshold of 80 dBA L_{eq} over an 8-hour period (FTA 2018) when detailed construction noise assessments are performed to evaluate potential impacts to community residences surrounding a project. Although this FTA guidance is not a regulation, it can serve as a quantified standard in the absence of such noise limits at the state and local jurisdictional levels.

With respect to vibration, Table 3.11-6 presents FTA guidance thresholds for assessing building damage risk and human annoyance. Akin to the aforementioned guidance for airborne noise from construction activities, the values in Table 3.11-6 represent recommended assessment guidance when local regulations lack such standards.

Table 3.11-6. Federal Transit Administration Vibration Threshold Guidance

Vibration Receptor	Vibration Assessment Metric	
	Peak Particle Velocity (PPV, in/sec)	Approximate Root Mean Square VdB*
Potential Damage to Structures by Building/Structural Category		
I. Reinforced-concrete, steel or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90
Residential Building Occupant Human Response		
Frequent events *(more than 70 events per day)*		72
Occasional events *(30-70 events per day)*		75
Infrequent events *(fewer than 30 events per day)*		80

Source: FTA 2018.
Notes:
* root mean square (rms) vibration level in decibels (VdB) is calculated from the PPV using a crest factor of 4 and is with respect to one (1) micro-inch per second.

3.11.2.2 State

California Department of Transportation Vibration Standards

The California Department of Transportation (Caltrans) conducted extensive research on human annoyance and damage to structures caused by vibration from short term construction activities and from long term highway operations. The criteria established by Caltrans are commonly used to assess vibration impacts from all types of projects and activities; given the absence of locally adopted vibration standards for jurisdictions in which the project would conduct operations, criteria based on the Caltrans standards are employed. Caltrans uses a threshold of 0.2 in/sec PPV for annoyance to persons, where a continuous vibration source is involved; for transient sources (represented by construction activities), Caltrans uses a threshold of 0.24 in/sec PPV (which equates to a distinctly perceptible level). For commercial buildings constructed of concrete and steel, Caltrans identifies a damage threshold of 0.5 in/sec PPV. For residential structures employing concrete foundation and wood frame construction, Caltrans identifies a conservative damage threshold vibration level standard of 0.3 in/sec PPV (Caltrans 2020b).

California Noise Control Act of 1973

Sections 46000 through 46080 of the California Health and Safety Code, known as the California Noise Control Act of 1973, declares that excessive noise is a serious hazard to the public health and welfare and that exposure to certain levels of noise can result in physiological, psychological, and economic damage. It also identifies a continuous and increasing bombardment of noise in urban, suburban, and rural areas. The California Noise Control Act declares that the State of California has a responsibility to protect the health and welfare of its citizens by the control, prevention, and abatement of noise. It is the policy of the state to provide an environment for all Californians free from noise that jeopardizes their health or welfare.

3.11.2.3 Local

Lassen County

Lassen County General Plan

Goal 1. A quiet and healthful environment with minimal noise intrusion.

Policy 1.1. Noise Generation Standards: Minimize the impact of noise generators by applying clear and appropriate standards during permit review and subsequent monitoring.

- **Action 1.1a:** Enforce Stationary Noise Source Levels. Enforce maximum and average noise level limits on permitted stationary sources based on their impact on the property line of the nearest noise-sensitive receptor as outlined in the Lassen County Noise Ordinance (Lassen County Code, Section 9.65.040). Where the noise-sensitive receptor involves a residence on a parcel with zoning or land use designation of "agriculture," the noise impact shall be evaluated at the boundary of the yard area or property line of the residence, whichever is closer to the residence.
- **Action 1.1c:** Noise monitoring may be required if determined to be necessary by the Director of Lassen County Department of Planning and Building Services or his/her designee, or if determined to be necessary by the Planning Commission or Board of Supervisors through the use permit process.

- **Action 1.1d:** Ensure Construction Occurs During Accepted Times of Day. Ensure that noise-generating construction work occurs during the accepted times of day, not between the hours of 7 p.m. and 7 a.m., pursuant to Standard N-4. Lassen County Noise Ordinance Section 9.65.070 (a)(9) exempts construction work from noise regulation between 7 a.m. and 7 p.m.

Policy 1.2. Noise Mitigation and Attenuation: Mitigate the effect of noise from new industrial or commercial uses, project-generated traffic, and short-term/temporary events on residential and other noise-sensitive land uses by applying feasible noise mitigation measures.

- **Action 1.2a:** Attenuate Project-Related Stationary Source Noise Impacts. As part of the environmental review process, the county shall work with project applicants to attenuate stationary-source noise impacts. Projects shall be designed to avoid long-term noise impacts or reduce those impacts to meet the applicable CNEL limits presented in Standard N-1.1. Noise impacts can be reduced using the following methods, or similar methods, as appropriate:
  - Create a distance buffer between stationary mechanical equipment and noise-sensitive receivers by placing parking lots, storm drain facilities, and landscaping between major stationary equipment and adjacent receivers.
  - Provide sound barriers or enclosures for equipment with significant sound-generation.
  - Where possible, place on-site buildings between major noise-generating equipment and the location of the closest adjacent noise-sensitive land use.
  - Where possible, locate/orient/direct/face/position noise-generating uses in such a way that minimizes noise for noise-sensitive receivers.
  - Use facility perimeter sound barriers (e.g., solid walls) or landscaped berms to reduce noise levels at immediately adjacent noise-sensitive uses.
- **Action 1.2b:** Require Noise Studies for Discretionary Projects. When a discretionary project has the potential to generate noise levels that exceed the standards presented in Standard N-11 (as identified through the California Environmental Quality Act [CEQA] process), a noise study and acceptable noise attenuation techniques to ensure compliance with Standard N-1 shall be required. For such discretionary projects, the environmental review process required by CEQA shall be employed to identify the required analysis and determine appropriate mitigation, as described in Standard N-2. The noise study shall be prepared in accordance with the requirements set forth in Standard N-3.
- **Action 1.2c:** Attenuate Project-Related Traffic Noise Impacts Near Sensitive Uses. Proposed discretionary developments that may result in an increase in traffic on roadways near existing noise-sensitive uses above levels allowed in the General Plan should include, as appropriate and feasible, traffic-calming design, low-noise pavement surfaces, sound barriers, or vegetated berms to minimize motor vehicle traffic noise.

Policy 1.3. Existing Land Use Incompatibilities. Help mitigate noise levels among existing incompatible land uses, as feasible, to enhance quality of life for noise-impacted residents and other sensitive receptors.

- **Action 1.3a:** Mitigate Stationary-Source Noise Impacts on Existing Residential and Other Sensitive Uses as Feasible. Upon receiving noise complaints, County Planning staff shall, in accordance with Departmental policy, investigate the noise source associated with the

complaint to determine if a violation of Ordinance-specified noise limits is occurring. Such investigation may include the direct measurement of sound levels using a sound-level meter or requiring the operator of the sound source to retain an acoustical professional to complete such measurements and analysis, as dictated in Standard N-4. Where sound levels exceed Noise Ordinance limits for stationary sound sources (Lassen County Code Section 9.65.040), the operator shall be required to install controls or alter operations in order to achieve compliance with the Noise Ordinance limits. Where sound levels investigated as the result of a complaint are in compliance, County Planning staff or the retained acoustical consultant may provide recommendations for reducing sound-level annoyance in exterior or interior areas of the property for which the complaint has been submitted. The recommendations may be followed on a voluntary basis, but cannot be used to compel the noise generator into reducing sound levels to less than those required in the Noise Ordinance.

- **Action 1.3b:** Support Attenuation of Highway Noise. The County should support efforts to reduce traffic noise levels on Highway 395, Highway 299, Highway 139, Highway 70, Highway 44, and Highway 36, along sections in proximity to concentrated residential development through prioritized roadway surface maintenance; use of noise-reducing surface treatments; traffic-safe tree or shrub plantings; or, in cases of significant noise exposure, use of lower speed limits and construction of sound walls. The County should also encourage enforcement of California Vehicle Code sections relating to adequate mufflers and modified exhaust systems.

Goal 2. A pattern of land uses that protects residents and other sensitive receptors from excessive noise.

Policy 2.1. Land Use Planning. Create General Plan land use and zoning patterns that prevent or buffer community residents and other sensitive receptors from incompatible land uses.

- **Action 2.1b:** Prohibit or Attenuate New Sensitive Uses in Noise-Impacted Areas. Prohibit new development of residential or other sensitive land uses in noise-impacted areas, as generally depicted by the limit of the 65 dBA CNEL contours illustrated in the Master Noise Exhibit (Lassen County Community Noise Levels, http://www.lassencounty.org/dept/planning-and-building-services/noise-element-and-data) unless the project design includes effective noise-attenuation measures that reduce exterior noise to 65 dBA L_{dn}/CNEL or less in exterior activity areas, and 45 dBA L_{dn}/CNEL or less in interior spaces with windows and doors closed by using the best available noise-reduction technology, which may include the following techniques:
  - Increase the distance between noise generators and noise-sensitive uses through the use of increased building setbacks and/or the dedication of noise easements.
  - Place noise-tolerant land elements of the site plan, such as parking lots, maintenance facilities, and utility areas, between vicinity noise generators and on-site receivers.
  - Use noise-tolerant structures, such as garages or carports, to shield noise-sensitive areas.
  - Orient buildings so that the noise-sensitive portions of a project, including outdoor areas, are shielded from noise sources.
  - Use berms and heavy landscaping to reduce noise levels.
  - Use sound-attenuating architectural design and building features, such as the following:
- Courtyards,
- Oriented openings and windows away from roadways

- Double- and triple-paned windows
- Additional layer of plywood and drywall in the exterior building and shell construction

With regard to building construction to achieve adequate noise attenuation, the County shall enforce the State Noise Insulation Standards (California Code of Regulations, Title 24).

Policy 2.2. Airport Noise and Highway Noise. Minimize vehicular and aircraft noise exposure for residents and occupants of noise-sensitive uses by planning land uses compatible with transportation corridors and airports, and applying noise attenuation designs and construction standards.

- **Action 2.2a:** Consult Airport Noise Contours. Noise contour lines illustrate the boundary or extent of an area subject to a given CNEL noise exposure and are generally provided in 5 dBA increments. For example, a receiver located between a 60 dBA CNEL and 65 dBA CNEL contour could be exposed to noise levels in the 60–65 dBA CNEL range. The 20-year projected airport noise contours in the Master Noise Exhibit (Lassen County Community Noise Levels, http://www.lassencounty.org/dept/planningand-building-services/noise-element-and-data) (or any Airport Land Use Compatibility Plan adopted more recently than this Noise Element) shall be used to indicate where special sound insulation measures may apply, consistent with Standard N-1. To avoid noise-related land use incompatibility, proposed noise-sensitive land uses should not be located within the 65 dBA CNEL contour associated with any of the airports in Lassen County.
- **Action 2.2b:** Consult Highway Noise Contours The 20-year projected highway noise contours in the Master Noise Exhibit (Lassen County Community Noise Levels, http://www.lassencounty.org/dept/planning-and-building-services/noise-element-and-data) shall be used to identify the location of the 65 dBA CNEL contour relative to a given highway segment. To avoid noise-related land use incompatibility, proposed noise-sensitive land uses should not be located within the 65 dBA CNEL contour associated with any highway within Lassen County. For new noise-sensitive uses proposed within the 65 dBA contour (where noise levels up to 70 dBA CNEL could exist), site design may need to include placement of exterior use areas behind proposed structures or the construction of a sound wall along the perimeter of the exterior use area.

Standards. Standards are the effective noise regulations that enforce this Noise Element consistent with the Lassen County Noise Ordinance (Lassen County Code, Chapter 9.65).

Standard N-1. CNEL Standards by Land Use Category

New noise-generating land uses may not exceed the following standards at the property line for the parcel containing said noise-generating use. For noise-sensitive uses in a project's vicinity, exterior noise standards shall be measured at the property line of the receiving noise-sensitive use (or at the yard boundary for residences on agriculture land), and interior noise standards shall be measured with all doors and windows closed.

Table 3.11-7. Community Noise Equivalent Level Standards for Receiving Land Uses

Land Use Category	Interior Noise Standard (dBA)	Exterior Noise Standard (dBA)*
Residential	45	65
Recreational/Open Space	N/A	65

Table 3.11-7. Community Noise Equivalent Level Standards for Receiving Land Uses

Land Use Category	Interior Noise Standard (dBA)	Exterior Noise Standard (dBA)*
Institutional	45	65
Commercial/Retail	50	75[b]
Industrial	N/A	90[b]
Agriculture	N/A	90
Resource Extraction	N/A	90[b]
Public Right-of-Way	N/A	90

[a] These noise generation limits are translated into hourly average (L_{eq}) limits in Lassen County Code, Section 9.65.040. Proposed new stationary noise sources must comply with both Standard N-1 and Section 9.65.040

[b] Noise levels generated from these sources are also subject to the land use noise standard of the receiving properties, where such a standard imposes a lower noise limit. For instance, while commercial noise levels of up to 75 dBA CNEL are allowed within a commercially zoned property, this commercial noise source must not exceed 65 dBA CNEL at any residential property boundary in the vicinity. The limit is applied at the receiving land use property line or (for residences in agriculture zones) at the boundary of the yard area.

Standard N-2. Environmental/Development Review Process

When noise-sensitive or noise-generating land uses, as defined in the Noise Ordinance (Lassen County Code, Chapter 9.65), are proposed and require a discretionary permit, the environmental review process required by CEQA shall be used to generate the required analysis and determine the appropriate mitigation per General Plan and state standards. For the purpose of completing CEQA review, future noise levels shall be predicted for mitigation required to address significant noise impacts (as identified in the CEQA review document) shall be ensured via incorporation of mitigation measures in a required Mitigation Monitoring and Reporting Program (MMRP), to be adopted concurrent with approval of discretionary permits for the project. Adherence to mitigation shall also be ensured through conditions of approval.

Standard N-3. Noise Study Requirements

When a discretionary project has the potential to generate noise levels in excess of N-1 standards, a noise study and acceptable plans to ensure compliance with the standards shall be required. The noise study shall measure or model the following, as appropriate: CNEL, Leq, and Lmax levels at property lines and, if feasible, receptor locations. Noise studies shall be prepared by qualified individuals using calibrated equipment under currently accepted professional standards, and include an analysis of the characteristics of the project in relation to noise levels, all feasible mitigations, and projected noise impacts. Noise studies shall do the following:

- Be the responsibility of the applicant, but accepted by the Department of Planning and Building Services.
- Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions.
- Estimate existing and projected (10 years) noise levels in terms of CNEL standards in Table 3.11-7 or the standards found in Lassen County Noise Ordinance Section 96.040, and compare predicted noise levels against such standards.
- Recommend appropriate mitigation to achieve compliance with the adopted policies and standards of the Noise Element and Noise Ordinance.
- Predict noise exposure at the property line after the prescribed mitigation measures have been implemented (quantify the noise reduction achieved by the mitigations). If the project does not comply with

the adopted standards of the Noise Element and Noise Ordinance, the analysis must provide acoustical information for a statement of overriding considerations for the project.

Standard N-4. Noise Complaint Investigation

When a noise complaint is submitted, authorized County personnel shall investigate the noise source associated with the complaint to determine if a violation of Noise Ordinance limits is occurring. If the noise level from the offending source is clearly audible over the background noise levels at the property line of the complainant, an investigation would assume to be warranted. Such investigation may include the direct measurement of sound levels by County staff using a sound-level meter or requiring the operator of the sound source to retain an acoustical professional to complete such measurements and analysis. The investigation shall include the following:

- Completion of sound level measurements using a sound-level meter meeting American National Standards Institute (ANSI) Type 1 or Type 2 specifications.
- A measurement location at the property line of the receiving property located closest to the noise source associated with the complaint.
- For residences located on agriculture parcels (agriculture zoning or land use designation, the measurement shall be located at the boundary of the yard area (presumed to extend not more than 50 feet from the residence) or the parcel boundary, whichever is closest to the noise source.
- Measurements for an appropriate duration to assess compliance with the applicable standard (for L_{eq} based standard, the measurement shall be no less than 1 hour while the noise source is operating; for the CNEL standard, the sound measurement shall be not less than 24 hours in duration). Periodic measurements for temporary events or non-standard operating circumstances may be warranted to ensure compliance.
- Recommendations for the operator of the noise source to achieve compliance (if a violation is occurring), or guidance for the receiving property to reduce noise exposure (if the noise is within allowable limits). The County can provide good neighbor policies to the noise-generating properties, but if the noise is within allowable limits, these suggestions shall not be enforceable.

Lassen County Code

Section 9.65.040

Lassen County Code Section 9.65.040 sets forth policies and guidelines regarding sound level limits, including:

(a) It shall be deemed a public nuisance (Lassen County Code Chapter 1.18) for any person to cause or allow the creation of any noise, which exceeds the one hour average sound level limits in Table 3.11-8, when the one-hour average sound level is measured at the property line of the property on which the noise is produced or at any location on a property that is receiving the noise.

Table 3.11-8. Sound Level Limits in Decibels (dBA)

Zone	Time	One-Hour Average Sound Level Limits (dBA)
(1) Single-Family Residential, Limited Multiple-Family Residential, Multiple Family Residential, Planned Unit Development, Planned Community, Resort, Public Campground/Boating/Beach, Primitive Area, Historical Site, Exclusive Agricultural, Open Space, General Agricultural, Agricultural-Residential, Agricultural, Upland Conservation, Upland Conservation/Resource Management, & Agricultural Forest Districts.[1,2]	7 a.m. to 7 p.m.	65
	7 p.m. to 7 a.m.	60
	10 p.m. to 7 a.m.	55
(2) Business Park, Highway Commercial, Local Convenience, General Commercial, Town Service, Retail Business, Airport Commercial & Underground Utility Districts. Also any future established commercial zones.	7 a.m. to 7 p.m.	75
	7 p.m. to 7 a.m.	70
	10 p.m. to 7 a.m.	65
(3) Limited Industrial, Light Industrial, Heavy Industrial, Industrial, Hydro-Electric & Timber Production Zone Districts. Also any future established industrial zones.	7 a.m. to 7 p.m.	90
	7 p.m. to 7 a.m.	80

1 Within agriculture zones, noise exposure limit is applicable only to residences, at the residential yard boundary.
2 These limits also govern the noise exposure level for a legal residence in any zone, applied at the residential yard boundary.

(b) Where a noise study has been conducted and the noise mitigation measures recommended by that study have been made conditions of approval of a use permit, which authorizes the noise-generating use or activity and the decision-making body approving the use permit determined that those mitigation measures reduce potential noise impacts to a level below significance, implementation and compliance with those noise mitigation measures shall constitute compliance with subsection (a) above.

(c) If the measured ambient noise level exceeds the applicable limit in Table 3.11-8, the allowable one-hour average sound level shall be the one-hour average ambient noise level, plus three decibels. The ambient noise level shall be measured when the alleged noise violation source is not operating.

(d) The sound level limit at a location on a boundary between two zones is the lower of the respective limits for the two zones.

(e) A fixed-location public utility distribution or transmission facility located on or adjacent to a property line shall be subject to the sound level limits of this section measured at or beyond six feet from the boundary of the easement upon which the facility is located, subject to the jurisdictional authority of the county. (Ord. 2021-04, § 2)

Section 9.65.040

In addition to the general limitations on sound levels in Section 040, the Lassen County Code sets forth the following additional prohibitions:

(a) It shall be deemed a public nuisance (Lassen County Code Chapter 1.18) for a person to make, continue or cause to be made or continued a disturbing, excessive or offensive noise, as defined in Section 9.65.020(9).

(b) The following acts, among others as determined by the noise officer or sheriff, are declared to be disturbing, excessive and offensive noises that violate this chapter and are a public nuisance (Lassen County Code Chapter 1.18).

(1) Unnecessarily using or operating or allowing another person to use or operate a vehicle horn, signaling device or other similar device, other than as regulated by the Vehicle Code.

Lassen County Draft Initial Study & Negative Declaration – Noise Element Update and Noise Ordinance (July 2021)

Lassen County's 2021 Noise Element Update and Noise Ordinance provides measured existing highway noise levels of 65 dBA CNEL for Highway 299 (SR-299) in Bieber and Nubieber in Lassen County (Lassen County 2021). The Draft Initial Study and Negative Declaration states (Lassen County 2021):

> Lassen County does not have the authority to regulate transportation activity, and noise from these well-established transportation facilities is not anticipated to decrease substantially in the future. Hence, an increase in the allowable exterior noise exposure for residences from 60 dBA CNEL to 65 dBA CNEL would actually provide a closer match to the existing ambient noise levels in close proximity to transportation facilities, and should not itself result in an increase to ambient noise levels.

Tuolumne County

Tuolumne County General Plan

The Noise Element in Chapter 5 of the Tuolumne County General Plan provides objectives, policies, and programs regarding noise, including the following:

Noise-sensitive uses identified by the Government Code and by Tuolumne County include residential development, schools, hospitals, convalescent homes, churches and libraries.

Goal 5.A. Protect the economic base of Tuolumne County and preserve the tranquility of residential areas by minimizing potential conflicts between transportation and stationary noise sources and noise sensitive land uses.

Policy 5.A.1. Advocate the design and site layout of new development of noise-sensitive land uses proposed adjacent to existing transportation noise sources incorporate noise reduction techniques so that the new development will not be affected by noise that exceeds the exposure threshold standards shown in Table 3.11-10.

Policy 5.A.2. Encourage new development of transportation noise sources be located and designed so that existing noise-sensitive land uses will not be exposed to noise levels that exceed the standards shown in Table 3.11-10 or Table 3.11-12.

Policy 5.A.3. Require new development of noise-sensitive land uses adjacent to existing stationary noise sources or land designated on the General Plan maps as HI, LI, BP or MPZ to be designed so that it will not be affected by noise levels exceeding the standards of Table 3.11-11.

Policy 5.A.4. Consider the effects of the development of new stationary noise sources or modifications of existing stationary noise sources on noise-sensitive land uses. Determine that new development or changes to existing development which requires a discretionary entitlement will not create new or exacerbate existing noise levels which exceed the standards shown on Table 3.11-12. This policy does not apply to noise levels associated with agricultural operations.

Policy 5.A.5. Consider methods of regulating noise within the County which exceeds the standards found in Table 3.11-11 from existing and future land uses where not preempted by Federal or State laws.

Policy 5.A.6. Consider providing a notification to property owners adjoining existing stationary and transportation noise sources of the know noise impacts to their properties.

Implementation Programs

Policy 5.A.a. Project Review. Review new public and private development proposals to determine conformance with the policies and programs of this Noise Element and determine that noise levels from new development will not exceed the noise level standards of Tables, 3.11-10, 3.11-11, or 3.11-12 on lands designated for noise-sensitive uses. For modifications or expansions of existing stationary noise sources that already exceed the standards of Table 3.11-11 on lands designated for noise-sensitive uses, Tuolumne County will determine that the new development will not increase the noise level received at the noise-sensitive land uses and the cumulative noise generated from the entire development site is equal to or less than the pre-modification or pre-expansion ambient noise level.

Policy 5.A.b. Analyze Potential Conflicts. Require an acoustical analysis where activities associated with proposed development are likely to produce noise levels exceeding those specified in Figures Tables, 3.11-10, 3.11-11, or 3.11-12 of this Element. The acoustical analysis shall be conducted early in the review process so that the possible effects of noise and noise mitigation can be considered in the project design. The requirements of an acoustical analysis are listed in Table 3.11-9.

Policy 5.A.c. Enforce Noise Reduction Measures. Institute procedures to enforce noise reduction measures required pursuant to an acoustical analysis during the building permit and construction processes and to monitor compliance with noise reduction measures during operation of the development.

Policy 5.A.d. Consider a Noise Ordinance. Consider implementing a noise ordinance to be used in defining acceptable noise levels received at various land uses and in enforcement when excessive noise levels have been reported and documented.

Policy 5.A.e. Consider Notification of Existing Noise Impacts. Consider implementing a notification procedure to all property owners within the impacted areas surrounding existing stationary and transportation noise sources of the present and potential future noise impacts that are likely to be experienced by development of those properties.

Table 3.11-9. Requirements for an Acoustical Analysis

An acoustical analysis prepared pursuant to the Noise Element will:
1) Be the financial responsibility of the applicant.
2) Be prepared by a qualified person experienced in the fields of environmental noise assessment and architectural acoustics.
3) Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions and significant noise sources. Where actual field measurements cannot be conducted, all sources of information used for calculation purposes shall be fully described.
4) Estimate existing and projected (20 years) noise levels and compare those levels to the adopted policies of the Noise Element. Projected future noise levels shall take into account noise from planned streets, highways and road connections.
5) Recommend appropriate mitigation to achieve compliance with the adopted policies of the Noise Element, giving preference to proper site planning and design over mitigation measures which require the construction of noise barriers or structural modifications to buildings which contain noise-sensitive land uses.
6) Estimate noise exposure after the prescribed mitigation measures have been implemented.

Table 3.11-10. Maximum Allowable Noise Exposure-Transportation Noise Sources Excluding Aviation Related Noise

Land Use	Outdoor Activity Areas	Interior Spaces
	L_{dn}/CNEL, dB	L_{dn}/CNEL, dB
Urban Residential	60	45
Transient Lodging	60	45
Hospitals, Nursing Homes	60	45
Churches, Meeting Halls, Office Buildings, Mortuaries	—	45
Schools, Libraries, Museums	—	45

1 An outdoor activity area is a location outside of the immediate structure where formal or informal activities are likely to happen. For example, anywhere on an urban residential property could be an outdoor activity area, while the outdoor activity area for a school would be the playground or sporting fields, and for a hospital would be an exterior patio or exercise area. Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land uses.

2 For typical construction methods, the reduction in the noise level from the outside of the structure to the inside is approximately 15dB. In a high noise environment, special construction techniques may be necessary to reduce the interior noise level to the standard.

Table 3.11-11. Maximum Allowable Noise Exposure-Stationary Noise Sources[1]

	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly Leq, dB[2]	50	45
Maximum level, dB[3]	70	65

1 This table applies to noise exposure as a result of stationary noise sources. For a development project or land use change involving a noise-sensitive land use, the noise from nearby noise sources will be considered during design and approval of the project, or in determining whether the land use change is appropriate. For development projects which may produce noise, land use changes and project review will consider the effects of the noise on possible noise-sensitive land uses. When considering modification or expansion at a site that already produces noise levels which exceed these standards at noise-sensitive land uses, the modification or expansion shall be reviewed to consider if the proposed action will further raise the existing noise levels received at the noise-sensitive land use(s). Noise-sensitive land uses include urban residential land uses, libraries, churches, and hospitals, in addition to nursing homes or schools which have over 6 beds or students, respectively. Transient lodging establishments which are considered noise sensitive land uses include hotels, motels, or homeless shelters, but not bed and breakfast establishments located in rural areas, campgrounds, or guest ranches.

2 The sound equivalent level as measured or modeled for a one-hour sample period. The daytime or nighttime value should not be exceeded as determined at the property line of the noise-sensitive land use. When determining the effectiveness of noise mitigation measures, the standards may be applied on the receptor side of noise barriers or other property line noise mitigation measures.

3 Similar to the hourly L_{eq}, except this level should not be exceeded for any length of time.

Table 3.11-12. Significance of Changes in Cumulative Noise Exposure[1]

Ambient Noise Level Without Project[2] (L_{dn} or CNEL)	Significant Impact if Cumulative Level Increases By:
<60 dB	+ 5.0 dB or more
60-65 dB	+ 3.0 dB or more
>65 dB	+ 1.5 dB or more

Source: Federal Interagency Committee on Noise (FICON), Federal Agency Review of Selected Airport Noise Analysis Issues, August 1992.

1 These standards shall be applied when considering the noise impacts from projects that could cause a significant increase in the cumulative noise exposure of existing noise-sensitive land uses. If it is likely that existing noise-sensitive land uses could experience these increases in cumulative noise exposure, as measured in CNEL or Ldn, then an acoustical analysis that meets the requirements of Figure 5.1 shall be accomplished and the results considered in project design.

2 Ambient Noise is defined as the composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

Tuolumne County Code

The County of Tuolumne does not explicitly provide policies or guidelines regarding noise in its County Ordinance Code.

City of Stockton

City of Stockton General Plan

Chapter 5 – Safety of the City of Stockton General Plan provides policies and guidelines regarding noise, including the following (City of Stockton 2018):

> Policy SAF-2.5. Protect the community from health hazards and annoyance associated with excessive noise levels.

Action SAF 2.5A. Prohibit new commercial, industrial, or other noise-generating land uses adjacent to existing sensitive noise receptors such as residential uses, schools, health care facilities, libraries, and churches if noise levels are expected to exceed 70 dBA Community Noise Equivalent (CNEL) (decibels on A-weighted scale CNEL) when measured at the property line of the noise sensitive land use.

Action SAF 2.5B. Require projects that would locate noise sensitive land uses where the projected ambient noise level is greater than the "normally acceptable" noise level indicated on Table 3.11-13 to provide an acoustical analysis that shall:

- Be the responsibility of the applicant;
- Be prepared by a qualified person experienced in the fields of environmental noise assessment and architectural acoustics;
- Include representative noise level measurements with sufficient sampling periods and locations adequately describe local conditions;
- Estimate existing and projected (20-year) noise levels in terms of L_{dn}/CNEL and compare the levels to the adopted noise policies and actions in this General Plan;
- Recommend appropriate mitigation to achieve compatibility with the adopted noise policies and standards;
- Where the noise source in question consists of intermittent single events, address the effects of maximum noise levels in sleeping rooms in terms of possible sleep disturbance;
- Estimate noise exposure after the prescribed mitigation measures have been implemented;
- If the project does not comply with the adopted standards and policies of this General Plan, provide acoustical information for a statement of overriding considerations for the project; and
- Describe a post-project assessment program, which could be used to evaluate the effectiveness of the proposed mitigation measures.

Action SAF 2.5C. Require noise produced by commercial uses to not exceed 75 dB L_{dn}/CNEL at the nearest property line.

Action SAF 2.5D. Grant exceptions to the noise standards for commercial and industrial uses only if a recorded noise easement is conveyed by the affected property owners.

Table 3.11-13. Maximum Allowable Noise Exposure by Land Use

Land Use Type	Noise Level, L_{dn} (dBA)						
	0-55	56-60	61-65	66-70	71-75	75-80	>81
Residential							
Urban Residential Infill							
Hotels, Motels							
Schools, Libraries, Churches, Hospitals, Extended Care Facilities							

Table 3.11-13. Maximum Allowable Noise Exposure by Land Use

Land Use Type	Noise Level, L_{dn} (dBA)						
	0-55	56-60	61-65	66-70	71-75	75-80	>81
Auditoriums, Concert Halls, Amphitheaters							
Sports Arenas, Outdoor Spectator Sports							
Playgrounds, Neighborhood Parks							
Golf Courses, Riding Stables, Water Recreation, Cemeteries							
Office Buildings, Business Commercial and Professional							
Mining, Industrial, Manufacturing, Utilities, Agriculture							

	Normally Acceptable. Specified land use is satisfactory based on the assumption that any buildings involved are of normal, conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable. New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed insulation features have been included in the design.
	Unacceptable. New construction or development should not be undertaken.

City of Stockton Municipal Code

Chapter 8.20 – Noise Regulations of the City of Stockton Municipal Code sets forth policies regarding, including the following:

Section 8.20.030. Public Nuisance Noise

General Noise Regulations.

1. Notwithstanding any other provisions of this chapter, and in addition thereto, it is unlawful for any person to willfully make or continue or permit or cause to be made or continued, any loud, unnecessary, or unusual noise which unreasonably disturbs the peace and quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing in the area.
2. The standards which shall be considered in determining whether a violation of the provisions of this section exists shall include, but not be limited to, the following:
    a. The volume of the noise;
    b. The intensity of the noise;
    c. Whether the nature of the noise is unusual or unnatural,
    d. Whether the origin of the noise is natural or unnatural;
    e. The volume and intensity of the background noise, if any;
    f. The proximity of the noise to residential sleeping facilities;
    g. The nature and zoning of the area within which the noise emanates;

h. The density of the inhabitation of the area within which the noise emanates;
i. The time of the day or night the noise occurs;
j. The duration of the noise;
k. Whether the noise is produced by a commercial or noncommercial activity.

3.11.3 Thresholds of Significance

The significance criteria used to evaluate the project impacts to noise are based on Appendix G of the CEQA Guidelines. According to Appendix G of the CEQA Guidelines, a significant impact related to noise would occur if the project would:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?
- Generation of excessive groundborne vibration or groundborne noise levels?
- For a project located within the vicinity of a private airstrip or 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?

Quantitative thresholds of significance have been established for the purposes of this analysis based on the polices and regulations described in Section 3.11.3 and are listed below.

- Construction Noise – Lassen County exempts construction activities from County noise thresholds, as long as construction takes place during allowable operating hours, and Tuolumne County and the City of Stockton do not explicitly set forth construction noise standards in their respective codes. For purposes of this analysis, therefore, construction noise levels that would exceed the FTA's recommended daytime construction noise level threshold of 80 dBA L_{eq} over an 8-hour period would be considered a significant impact.
- Construction Vibration – Guidance from the FTA establishes a building occupant annoyance threshold of 75 VdB for "occasional events" and a building damage risk threshold of 0.3 in/sec PPV, per Table 3.11-6. Caltrans identifies a similar damage threshold vibration level standard of 0.3 in/sec PPV for older residential structures employing concrete foundation and wood frame construction.
- Off-site Project-attributed transportation noise – For purposes of this analysis, a direct roadway noise impact from the Tuolumne Facility would be considered significant if increases in roadway traffic noise levels attributed to the Proposed Project were greater than 3 dBA CNEL at an existing noise-sensitive land use. Per Lassen County's 2021 Noise Element Update and Noise Ordinance, a direct roadway noise impact from the Lassen Facility would be considered significant if project-attributed traffic noise levels were to exceed 65 dBA CNEL, as the existing measured ambient noise levels in close proximity to Highway 299 (SR-299) are 65 dBA CNEL (Lassen County 2021). Additionally, Table 3.11-10 establishes a 60 dBA L_{dn} threshold for non-aviation related transportation noise, as found in Tuolumne County's General Plan Noise Element. This 60 dBA Ldn limit would also apply to onsite transportation noise, such as low-speed rail operations during wood pellet loading.
- Project-attributed Stationary Source Noise Emission to the Community – Per Table 3.11-8, Lassen County's Code of Ordinances establishes daytime and evening thresholds of 65 and 60 dBA hourly L_{eq}, respectively, and 55 dBA hourly L_{eq} for nighttime stationary operational noise. As appearing in Table 3.11-11, Tuolumne

County's General Plan Noise Element sets forth a daytime threshold of 50 dBA hourly L_{eq} and a nighttime threshold of 45 dBA hourly L_{eq}. The City of Stockton's General Plan Noise Element establishes a 60 dBA L_{dn} noise threshold, as appearing in Table 3.11-13.

3.11.4 Impact Analysis

3.11.4.1 Methodology

Short-Term Construction

Construction noise and vibration are temporary phenomena, with emission levels varying from hour to hour and day to day, depending on the equipment in use, the operations performed, and the distance between the source and receptor. Equipment that would be in use during construction would include, in part, graders, backhoes, rubber-tired dozers, loaders, cranes, forklifts, pavers, rollers, and air compressors. The typical maximum noise levels at a distance of 50 feet from various pieces of construction equipment and activities anticipated for use on the proposed project site are presented in Table 3.11-14. Note that the equipment noise levels presented in Table 3.11-14 are maximum noise levels. Usually, construction equipment operates in alternating cycles of full power and low power, producing average noise levels over time that are less than the maximum noise level. The average sound level of construction activity also depends on the amount of time that the equipment operates and the intensity of construction activities during that time.

Table 3.11-14. Typical Construction Equipment Maximum Noise Levels

Equipment Type	Typical Equipment (L_{max} dBA at 50 Feet)
All other equipment > 5 HP	85
Backhoe	78
Compressor (air)	78
Concrete saw	90
Crane	81
Dozer	82
Excavator	81
Flatbed truck	74
Front-end loader	79
Generator	72
Grader	85
Man lift	75
Paver	77
Roller	80
Welder/torch	73

Source: DOT 2006.
Note: L_{max} = maximum sound level; dBA = A-weighted decibels.

Aggregate noise emissions from proposed project construction activities, broken down by sequential phase, were predicted at two evaluation distances to the nearest existing noise-sensitive receptor: (1) from the position nearest to the construction site boundary and (2) from the geographic center of the construction site, which serves as the time-averaged location or geographic *acoustical centroid* of active construction equipment for the phase under study. The intent of the former distance is to help evaluate anticipated construction noise from a limited quantity

of equipment or vehicle activity expected to be at the boundary for some period of time, which would be most appropriate for phases such as site preparation, grading, and paving. The latter distance is used in a manner similar to the general assessment technique as described in the FTA guidance for construction noise assessment, when the location of individual equipment for a given construction phase is uncertain over some extent (or the entirety) of the construction site area. In this studied scenario, because of the equipment location uncertainty, all the equipment for a construction phase is assumed to operate—on average—from the acoustical centroid position. These two distances to the apparent closest noise-sensitive receptor for each of the seven sequential construction phases at each respective facility are summarized in section 3.11.5.2. At the site boundary, this analysis assumes that only the two loudest pieces of equipment for the listed phase would be involved in construction activity for the 1-hour period. In other words, at such proximity, the operating equipment cannot "stack" or crowd the vicinity and still operate. For the acoustical centroid case, which intends to be a geographic average position for all equipment during the indicated phase, this analysis assumes that all equipment for the indicated activity would be operating in a given hour over the 8-hour assessment period.

A Microsoft Excel-based noise prediction model emulating and using reference data from the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) (DOT 2008) was used to estimate construction noise levels at the nearest occupied noise-sensitive land use. (Although the FHWA RCNM was funded and promulgated by FHWA, it is often used for non-roadway projects, because the same types of construction equipment used for roadway projects are often used for other types of construction.) Input variables for the predictive modeling consist of the equipment type and number of each (e.g., two graders, a loader, and a tractor), the duty cycle for each piece of equipment (e.g., percentage of time within a specific time period, such as an hour, when the equipment is expected to operate at full power or capacity and thus make noise at a level comparable to what is presented in Table 3.11-14), and the distance from the noise-sensitive receiver. The predictive model also considers how many hours that equipment may be on site and operating (or idling) during the course of an established work shift. Conservatively, no topographical or structural shielding was assumed in the modeling. The FHWA RCNM has default duty-cycle values for the various pieces of equipment, which were derived from an extensive study of typical construction activity patterns. Those default duty-cycle values were used for this noise analysis, which is detailed in Appendix H2, Construction Noise Modeling Input and Output to this Draft EIR, and produce the predicted results displayed below in section 3.11.5.2 of this Draft EIR.

Vibration

Groundborne vibration attenuates rapidly, even over short distances. The attenuation of groundborne vibration as it propagates from source to receptor through intervening soils and rock strata can be estimated with expressions found in FTA and Caltrans guidance. To examine potential building damage risk and thus use PPV as the evaluation metric, vibration velocity level can be estimated with the following expression (FTA 2018):

$$PPV_{rcvr} = PPV_{ref} * (25/D)^{n}$$

where PPV_{rcvr} is the predicted vibration velocity at the receiver position, PPV_{ref} is the reference value at 25 feet from the vibration source, D is the actual horizontal distance to the receiver, and "n" is the Wiss exponent that FTA defines as 1.5 to generally characterize the propagation of vibration through soil/strata between the source and the receptor position.

For evaluating potential annoyance of a building occupant, FTA guidance provides an additional expression using the VdB metric (FTA 2018):

$$VdB_{rcvr} = VdB_{ref} - 30*LOG(D/25)$$

where VdB_{rcvr} is the predicted RMS vibration velocity at the receiver position, VdB_{ref} is the reference value at 25 feet from the vibration source, and D is the actual horizontal distance to the receiver.

Off-Site Traffic Noise Exposure

The proposed project would result in the creation of additional vehicle trips on local arterial roadways at the Lassen Facility and Tuolumne Facility sites, which could result in increased traffic noise levels at adjacent noise-sensitive land uses. Appendix H3, Traffic Noise Modeling Input and Output contains a spreadsheet with traffic volume data for each site.

The FHWA's Highway Traffic Noise Prediction Model RD-77-108 was used to estimate potential noise impacts at adjacent noise-sensitive uses. Information used in the model included Average Daily Traffic (ADT; from Caltrans Traffic Census Program volumes in 2022), posted traffic speeds, day/evening/night mix percentage, and truck mix percentage. Consistent with Caltrans guidance (Caltrans 2013), this analysis assumes 80% of the ADT occurs during daytime hours (7:00 a.m. to 7:00 p.m.), 5% during the evening (7:00 p.m. to 10:00 p.m.), and 15% during the nighttime (10:00 p.m. to 7:00 a.m.) for existing conditions. The day/night ADT distribution data from Dudek's Transportation Impact Analysis were used to calculate the time-of-day distributions for existing plus project conditions (see Appendix H3 for more details). The truck percentages used in the noise model for existing arterials varied between the existing and existing plus project conditions at both the Lassen and Tuolumne sites, as appearing in Appendix H3. The change in roadway noise levels was predicted for both the Lassen Facility and Tuolumne Facility in an existing and existing plus project scenario.

Stationary Noise Sources

The proposed project would consist of three primary activities: feedstock acquisition, wood pellet production, and transport to market. The impact analyses below evaluate each of these primary activity groupings as related to noise.

The proposed project would add a variety of noise-producing feedstock, wood processing and transport equipment that include those presented in Table 3.11-15 below. Most of these noise-producing equipment or sound sources would be considered stationary, or exhibit limited mobility within a defined area—and were modeled as such. Using Datakustik CadnaA that has algorithms based on the International Organization of Standardization (ISO) Standard 9613-2, "Attenuation of Sound During Propagation Outdoors, Part 2: General Method of Calculation" (ISO 1996), sound propagation prediction of project on-site noise sources was assumed to reflect the following conditions and parameters:

- Acoustical ground absorption coefficient estimated to be one (1), which represents absorptive ground cover (e.g., highly porous soils and/or vegetative natural terrain surfaces).
- Acoustical reflection order is set at zero (0), which precludes sound path reflections when contact is made with a modeled building surface, but is still appropriate when source-to-receptor distances are relatively large and would diminish the acoustical contribution of reflected paths owing to the attenuation with greater distance travelled.

- Climate conditions are 50° degrees Fahrenheit, 70% relative humidity. While these temperature and humidity settings may vary with the seasons, their influence on the predicted aggregate sound levels for the nearest potentially impacted offsite receptors would tend to be no greater than a decibel.
- For each of the Lassen and Tuolumne sites, six (6) total scenarios representing the one-hour L_{eq} of project operations over various time periods: a 12-hour period, a 24-hour period during a daytime hour, and a 24-hour period during a nighttime hour. Each modeled operational time period includes two scenarios, one including site-adjoining rail operations, and one without.

In addition to these predicted conditions and parameters, the reference sound power (L_w) levels listed below in Table 3.11-15 were used to define area sources of sound emission in the CadnaA computer model space with respect to an arrangement of rendered line, area, and point sources that depict the various equipment structures shown on the project site plan. Please see Appendix H4 for quantitative details of the inputs and outputs that form the basis of the following assessment presentations.

Table 3.11-15. Sound Power Levels for the Modeled Individual Sources of Outdoor Noise Emission

Source	A-weighted Sound Level per Octave Band Center Frequency (OBCF in Hertz [Hz])									Overall Sound Level (dBA)
	31.5	63	125	250	500	1k	2k	4k	8k	
Log Crane	n/a	82	99	92	76	70	63	57	51	106
Debarking Drum	54	61	72	78	83	83	81	1	-1.1	87.8
Log Chipper	51	62	76	93	99	103	104	96	90	107.9
Stacker/Reclaimer	71	85	91	95	102	101	98	97	86	106.5
Dryer System (Chip Dryer)	119	103	92	81	70	65	60	56	51	83.1
Dryer System (Chip Dryer Exhaust)	121	110	102	94	87	84	79	75	80	92.6
Green Hammer Mill Tower, Dry Hammer Mill Building	N/A	N/A	106	104	102	99	97	95	N/A	109.9
Log Infeed Deck	N/A	N/A	N/A	N/A	N/A	N/A	95	N/A	N/A	95
Truck Dumps	89.6	88.8	84.9	81.4	76.8	75	73.2	73	72.9	93.5
Fuel Screening & Hog Tower, Residuals Screening Tower	76.6	89.8	99.9	105.4	108.8	111	110.2	104	94.9	115.8
Pellet Mill Building	0	0	109	100	92	86	83	81	0	96.9
Truck Scales (Idling Trucks)	126	109	105	94	80	73	66	56	50	92.7
Conveyor Path A-weighted per each meter of length	40	52	66	73	77	77	73	61	51	81.6
Train - "4036" at 50 feet	31.6	133.6	128.6	124.6	128.6	128.6	127.6	127.6	123.6	139

Notes: OBCF = Octave Band Center Frequency; dBA = A-weighted decibels

* Reference sound power level data shown in Appendix H4.

3.11.4.2 Project Impacts

Impact NOI-1 The project would not result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Feedstock Acquisition

Sustainable Forest Management Projects

The Final Program EIR for the California Vegetation Treatment Program, prepared for the California Board of Forestry and Fire Protection by Ascent Environmental, analyzes potential noise impacts related to sustainable forest management projects, which are discussed below (2019).

Short-Term Treatment Activities

Noise-intensive vegetation treatment activities related to sustainable forest management projects include prescribed burning, mechanical vegetation treatment, and manual vegetation treatment. The typical equipment used for each respective noise-intensive activity is shown in Table 3.11-16.

Table 3.11-16. Sustainable Forest Management Projects – Equipment by Treatment Activity

Treatment Activity	Equipment Types
Mechanical Vegetation Treatment	Dozers Excavators Masticators Chippers Skid Steer Fire Engines (at least 1)
Manual Vegetation Treatment	Chainsaws (4 to 8) Masticators Chippers (only used occasionally) Fire Engine

Source: CalVTP EIR - Ascent Environmental 2019.

Reference noise levels for the individual equipment used in treatment activities (as appearing in Table 3.11-16) are summarized in Table 3.11-17.

Table 3.11-17. Sustainable Forest Management Projects – Noise Levels from Treatment Equipment Types

Equipment Type	Typical Noise Level (dB) at 50 feet[1]
Chainsaw	85
Dozer	85
Shears (on Backhoe)	85
Excavator	85

Table 3.11-17. Sustainable Forest Management Projects – Noise Levels from Treatment Equipment Types

Equipment Type	Typical Noise Level (dB) at 50 feet[1]
Flat Bed Trucks	84
Wood Chipper	75[2]

Sources:
1 reference noise levels from FTA 2018 except where indicated otherwise
2 Berger et al. 2016.
3 CalVTP EIR - Ascent Environmental 2019.
Notes: Assumes all equipment is fitted with a properly maintained and operational noise control device, per manufacturer specifications. Noise levels listed are manufacture-specified noise levels for each piece of equipment.

As appearing in Table 3.11-17, noise levels generated by equipment used in treatment activities ranges from 75 to 87.9 dB at 50 feet. Additionally, it is likely that during treatment activities, individual equipment would be spread out rather than operating close together, considering some of the equipment listed are heavy-duty and/or off-road (Ascent Environmental 2019). Table 3.11-18 summarizes the combined noise levels at 50 feet for each respective noise-intensive treatment activity.

Table 3.11-18. Sustainable Forest Management Projects – Noise Levels from Treatment Activities

Treatment Activity	Noise Level (L_{eq} dB) at 50 feet	Noise Level (L_{max} dB) at 50 feet
Mechanical Vegetation Treatment	87.0	91.0
Manual Vegetation Treatment	87.0	91.0

Sources: FTA 2018; CalVTP EIR - Ascent Environmental 2019.
Notes: dB = decibels; L_{eq} = equivalent continuous sound level; L_{max} = maximum sound level

As shown in Table 3.11-18, the combined noise levels from each respective treatment activity are similar, ranging from 86.8 to 89.9 dB L_{eq}, or 90.8 to 91.8 dB L_{max}.

As noted (and further discussed in Ascent Environmental 2019), it is unlikely that noise from multiple pieces of equipment would combine to affect any noise-sensitive receptor for an extended period. Further, while no specific treatment locations have yet been identified in this program-level analysis, and thus the specific location of noise-sensitive receptors in relation to any particular treatment activities is unknown at this time, due to the nature of Sustainable Forest Management Project activities, it is likely that many of these activities will occur in remote areas not proximate to sensitive receptors. Moreover, increased noise levels related to treatment activities would be temporary. Nonetheless, this analysis conservatively assumes that in developed areas the likelihood is high that noise-sensitive receptors could be located in close proximity to vegetation treatments. Additionally, although less likely, noise-sensitive receptors could be located in close proximity to vegetation treatments in undeveloped areas as well. It is further assumed that noise-sensitive receptors near treatment activity sites could experience elevated noise levels.

Vegetation treatment activities undertaken as to implement Sustainable Forest Management Projects would adhere to the PDFs that require consistency with local noise policies and ordinances to the extent the project is subject to them, limit vegetation treatment activities to daytime hours, ensure proper notification of nearby sensitive receptors, and locate treatment activities and staging areas away from sensitive receptors to minimize noise exposure (as further described in Section 2.4). Further, as noted, any increase in ambient noise levels exposure at nearby receptors would be temporary and periodic. Therefore, implementation of Sustainable Forest Management

Project activities would not result in the exposure of noise-sensitive receptors to a substantial temporary increase in ambient noise levels. This impact would be **less than significant.**

Off-Site Traffic Noise Exposure

Treatment activities related to sustainable forest management projects would involve increased haul truck trips (i.e., transportation of heavy equipment, crews, livestock, etc., to treatment sites), which could generate increased noise levels for noise-sensitive receptors whom haul trucks would pass by (Ascent Environmental 2019).

Because vegetation treatment activities would be required to adhere to PDF NOI-1, which limits vegetation treatment activities to daytime hours (see Section 2.4), this haul truck traffic would not have the potential to result in sleep disturbance during noise-sensitive evening and nighttime hours. Also, the increase in noise-generating haul truck passbys associated with treatment activity at any particulate treatment site would be temporary. As a result, increased off-site traffic noise exposure during sustainable forest management project treatment activities would be. **less than significant.**

Wood Pellet Production

Lassen Facility

Short-Term Construction

Table 3.11-19 summarizes the distance of the apparent closest noise-sensitive receptor from the position nearest to the construction site boundary and from the geographic center of the construction site, which serves as the time-averaged location or geographic *acoustical centroid* of active construction equipment for the phase under study for each of the seven sequential construction phases at the Lassen Facility. At the site boundary, this analysis assumes that only the two loudest pieces of equipment for the listed phase would be involved in construction activity for the 1-hour period. In other words, at such proximity, the operating equipment cannot "stack" or crowd the vicinity and still operate. For the acoustical centroid case, which intends to be a geographic average position for all equipment during the indicated phase, this analysis assumes that all equipment for the indicated activity would be operating in a given hour over the 8-hour assessment period.

Table 3.11-19. Estimated Distances between Construction Activities and the Nearest Noise-Sensitive Receptors – Lassen Facility

Construction Phase (and Equipment Types Involved)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)	Distance from Nearest Noise-Sensitive Receptor to Acoustical Centroid of Site (Feet)
Demolition (concrete saw, excavator, tractor)	620	1560
Site preparation (dozer, backhoe, tractor)	620	1560
Grading (excavator, grader, dozer, tractor)	620	1560
Building/Vertical Construction (crane, man-lift, generator, backhoe, welder)	620	1560

Table 3.11-19. Estimated Distances between Construction Activities and the Nearest Noise-Sensitive Receptors – Lassen Facility

Construction Phase (and Equipment Types Involved)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)	Distance from Nearest Noise-Sensitive Receptor to Acoustical Centroid of Site (Feet)
Paving (paver, roller, concrete mixer truck)	620	1560
Architectural coating (compressor)	620	1560
Rail Spurs Construction	620	1560

Based on these two distances, a Microsoft Excel-based RCNM emulator was used to estimate construction noise levels at the nearest occupied noise-sensitive land use, for which the results are shown in Table 3.11-20.

Table 3.11-20. Predicted Construction Noise Levels per Activity Phase – Lassen Facility

Construction Phase (and Equipment Types Involved)	8-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	8-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Acoustical Centroid of Site (dBA)
Demolition (concrete saw, excavator, tractor)	58.8	50.9
Site preparation (dozer, backhoe, tractor)	56.4	50.3
Grading (excavator, grader, dozer, tractor)	58.7	49.9
Building/Vertical Construction (crane, man-lift, generator, backhoe, welder)	50.9	44.6
Paving (paver, roller, concrete mixer truck)	53.0	45.5
Architectural coating (compressor)	45.7	36.6
Rail Spurs Construction	n/a	n/a

As presented in Table 3.11-20, the estimated construction noise levels are predicted to reach up to 58.8 dBA 8-hour L_{eq} at the nearest existing residences (as close as 620 feet away) when the construction of the Lassen Facility's pellet operations takes place near the western project boundaries. Note that these estimated noise levels would occur when noted pieces of heavy equipment would each operate for a full 8-hour period at a source-to-receiver distance of 620 feet. On an average construction workday, heavy equipment will be operating sporadically throughout the project site and more frequently be located away from the southern edge. Hence, at more typical distances closer to the center of the project site (approximately 1560 feet from the nearest existing residence), hourly construction noise exposure levels are estimated to range from approximately 36.6 dBA L_{eq} to 50.9 dBA L_{eq} at the nearest existing residence. This latter range of predicted construction noise levels is comparable to the 41-49 dBA range of

sampled daytime L_{eq} values in the vicinity of the Lassen site as indicated in Table 3.11-3, which means these temporary construction noise exposures at the nearest offsite receivers are expected to be either lower than existing outdoor ambient sound levels or cause an increase of up to 4 dB. On occasions where the onsite construction activities are closer to the boundary, the predicted 58.8 dBA 8-hour L_{eq} value from Table 3.11-20 suggests that audible double-digit decibel increases to the existing outdoor sound environment could occur.

Lassen County exempts construction activities from County noise thresholds, as long as construction takes place during allowable operating hours. In summary, while temporary construction noise exposure levels during allowable daytime hours may cause an audible increase to the existing sound environment, they will not exceed the FTA's recommended 80 dBA L_{eq} 8-hour threshold at the nearest residential receiver. Therefore, temporary construction-related noise impacts would be considered **less than significant.**

Off-Site Traffic Noise Exposure

Table 3.11-21 provides a summary of the results for the analysis of roadway noise based on existing ADT volumes for each studied roadway segment. The traffic noise levels in Table 3.11-21 are based upon Caltrans ADT traffic volumes and non-passenger car equivalent (PCE) volumes found in Dudek's Transportation Analysis.

Table 3.11-21. Lassen Facility Traffic Noise Levels With and Without Project

Street Name	From	To	Noise Level Without Project (CNEL dBA)	Noise Level With Project (CNEL dBA)	Project Increase (CNEL dBA)
SR-299 East of Project Site	SR-299	Bieber Lookout Rd/Susanville Rd	60.3	63.9	3.6
SR-299 West of Project Site	SR-89	SR-299	60.1	63.9	3.8

Source: Appendix H3.

The inclusion of project operational traffic in the project results in a maximum traffic noise rise of 3.8 dBA along SR-299 to the west of the project site. The anticipated combined traffic noise level, encompassing both existing and project-related traffic, would not exceed 65 dBA CNEL; hence, there would not be an increase in the existing traffic noise levels at SR-299 in both Bieber and Nubieber, which were measured to be 65 dBA CNEL. In the context of community noise (i.e., outside of a controlled environment), the predicted project-attributed roadway traffic noise would be less than the measured existing ambient noise levels, and therefore, project-attributed traffic noise levels would be **less than significant**.

Stationary Noise Sources

Predicted noise exposure levels attributed to concurrent operation of the Lassen Facility's onsite stationary sources (i.e., conveyor belts, log collection/transport, debarking, drying, idling haul trucks) as modeled appear in Tables 3.11-22 to 3.11-24.

Table 3.11-22. Lassen Facility Operation Noise Prediction Model Results (12-Hour Scenario)

Modeled Receptor	Modeled Receptor Distance from Project Boundary	Predicted Operation Noise (dBA hourly L_{eq}) at Indicated Modeled Receptor – With Rail Operations	Predicted Operation Noise (dBA hourly L_{eq}) at Indicated Modeled Receptor – Without Rail Operations
NSR1	3300 ft Northeast	37.3	36.6
NSR2	620 ft West	50.3	50.0
NSR3	1300 ft West	50.1	50.0
NSR4	1500 ft West	48.1	47.9
NSR5	1400 ft West	52.9	52.8
NSR6	300 ft Southeast	56.0	55.5
NSR7	300 ft Southeast	59.0	58.9
NSR8	250 feet East	54.2	54.0

* NSR = noise-sensitive receptors; dBA = A-weighted decibels; Leq = energy-averaged noise level

Table 3.11-23. Lassen Facility Operation Noise Prediction Model Results Summary (24-Hour Daytime Hour Scenario)

Modeled Receptor	Modeled Receptor Distance from Project Boundary	Predicted Operation Noise (dBA hourly L_{eq}) at Indicated Modeled Receptor – With Rail Operations	Predicted Operation Noise (dBA hourly L_{eq}) at Indicated Modeled Receptor – Without Rail Operations
NSR1	3300 ft Northeast	37.2	36.4
NSR2	620 ft West	49.5	49.2
NSR3	1300 ft West	48.6	48.3
NSR4	1500 ft West	46.5	46.2
NSR5	1400 ft West	50.6	50.5
NSR6	300 ft Southeast	56.0	55.5
NSR7	300 ft Southeast	59.0	58.9
NSR8	250 feet East	54.2	53.9

* NSR = noise-sensitive receptors; dBA = A-weighted decibels; Leq = energy-averaged noise level

Table 3.11-24. Lassen Facility Operation Noise Prediction Model Results Summary (24-Hour Nighttime Hour Scenario)

Modeled Receptor	Modeled Receptor Distance from Project Boundary	Predicted Operation Noise (dBA hourly L_{eq}) at Indicated Modeled Receptor – With Rail Operations	Predicted Operation Noise (dBA hourly L_{eq}) at Indicated Modeled Receptor – Without Rail Operations
NSR1	3300 ft Northeast	37.2	36.4
NSR2	620 ft West	48.5	48.1
NSR3	1300 ft West	47.0	46.7
NSR4	1500 ft West	45.1	44.7
NSR5	1400 ft West	48.5	48.3
NSR6	300 ft Southeast	51.4	50.1

Table 3.11-24. Lassen Facility Operation Noise Prediction Model Results Summary (24-Hour Nighttime Hour Scenario)

Modeled Receptor	Modeled Receptor Distance from Project Boundary	Predicted Operation Noise (dBA hourly L_{eq}) at Indicated Modeled Receptor – With Rail Operations	Predicted Operation Noise (dBA hourly L_{eq}) at Indicated Modeled Receptor – Without Rail Operations
NSR7	300 ft Southeast	50.9	50.1
NSR8	250 feet East	48.0	46.9

* NSR = noise-sensitive receptors; dBA = A-weighted decibels; Leq = energy-averaged noise level

The predicted levels at the studied noise-sensitive receptor locations during each operational time period, 12-hours and 24-hours (daytime and nighttime hour), both including and not including rail operations, do not exceed Lassen County's 55 dBA hourly L_{eq} nighttime noise threshold as appearing in Table 3.11-24 (when the facility would be operating during nighttime hours, nor its daytime and evening thresholds of 65 and 60 dBA hourly L_{eq}, as appearing in Tables 3.11-22 and 3.11-23 (when the facility would be operating during daytime and evening hours); therefore, potential noise impact associated with project operation would be considered **less than significant**.

Figures 3.11-1 to 3.11-6 correspondingly illustrate (for these same modeled varying operation scenarios) predicted Lassen Facility stationary equipment operation sound levels across a horizontal plane approximately five feet above grade (i.e., a first-floor or pedestrian listening elevation) over the Lassen Facility site and beyond into the surrounding vicinity.

Tuolumne Facility

Short-Term Construction

Table 3.11-25 summarizes the distance of the apparent closest noise-sensitive receptor from the position nearest to the construction site boundary and from the geographic center of the construction site, which serves as the time-averaged location or geographic *acoustical centroid* of active construction equipment for the phase under study for each of the seven sequential construction phases at the Tuolumne Facility. At the site boundary, this analysis assumes that only the two loudest pieces of equipment for the listed phase would be involved in construction activity for the 1-hour period. In other words, at such proximity, the operating equipment cannot "stack" or crowd the vicinity and still operate. For the acoustical centroid case, which intends to be a geographic average position for all equipment during the indicated phase, this analysis assumes that all equipment for the indicated activity would be operating in a given hour over the 8-hour assessment period.

Table 3.11-25. Estimated Distances between Construction Activities and the Nearest Noise-Sensitive Receptors – Tuolumne Facility

Construction Phase (and Equipment Types Involved)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)	Distance from Nearest Noise-Sensitive Receptor to Acoustical Centroid of Site (Feet)
Demolition (concrete saw, excavator, tractor)	120	800
Site preparation (dozer, backhoe, tractor)	120	800

Table 3.11-25. Estimated Distances between Construction Activities and the Nearest Noise-Sensitive Receptors – Tuolumne Facility

Construction Phase (and Equipment Types Involved)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)	Distance from Nearest Noise-Sensitive Receptor to Acoustical Centroid of Site (Feet)
Grading (excavator, grader, dozer, tractor)	120	800
Building/Vertical Construction (crane, man-lift, generator, backhoe, welder)	120	800
Paving (paver, roller, concrete mixer truck)	120	800
Architectural coating (compressor)	120	800
Rail Spurs Construction	120	800

Based on these two distances, a Microsoft Excel-based FHWA RCNM emulator was used to estimate construction noise levels at the nearest occupied noise-sensitive land use, for which the results are shown in Table 3.11-26.

Table 3.11-26. Predicted Construction Noise Levels per Activity Phase – Tuolumne Facility

Construction Phase (and Equipment Types Involved)	8-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	8-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Acoustical Centroid of Site (dBA)
Demolition (concrete saw, excavator, tractor)	75.3	57.5
Site preparation (dozer, backhoe, tractor)	73.0	56.9
Grading (excavator, grader, dozer, tractor)	75.2	56.5
Building/Vertical Construction (crane, man-lift, generator, backhoe, welder)	67.4	51.2
Paving (paver, roller, concrete mixer truck)	69.6	52.1
Architectural coating (compressor)	62.3	43.2
Rail Spurs Construction	n/a	n/a

As presented in Table 3.11-26, the estimated construction noise levels are predicted to reach up to 75.3 dBA 8-hour L_{eq} at the nearest existing residences (as close as 120 feet away) when the construction of the Tuolumne Facility's pellet operations takes place near the northwestern project boundaries. Note that these estimated noise levels would occur when noted pieces of heavy equipment would each operate for a full hour at a source-to-receiver

distance of 120 feet. On an average construction workday, heavy equipment will be operating sporadically throughout the project site and more frequently be located away from the southern edge. Hence, at more typical distances closer to the center of the project site (approximately 800 feet from the nearest existing residence), hourly construction noise exposure levels are estimated to range from approximately 43.2 dBA L_{eq} to 57.5 dBA L_{eq} at the nearest existing residence. This latter range of predicted construction noise levels is less than the 61-66 dBA range of sampled daytime L_{eq} values in the vicinity of the Lassen site as indicated in Table 3.11-4, which means these temporary construction noise exposures at the nearest offsite receivers are expected to be less than existing outdoor ambient sound levels and cause an imperceptible increase (i.e., less than a decibel due to logarithmic addition). On occasions where the onsite construction activities are closer to the boundary, the predicted 75.3 dBA 8-hour L_{eq} value from Table 3.11-26 suggests that audible double-digit decibel increases to the existing outdoor sound environment could occur.

While construction activity at the Tuolumne site may therefore cause temporary audible increases to the outdoor sound environment at the nearest offsite receptors, Tuolumne County does not explicitly set forth construction noise standards, and construction noise at the Tuolumne Facility will not exceed the FTA's recommended 80 dBA L_{eq} 8-hour threshold at the nearest residential receiver. Therefore, temporary construction-related noise impacts would be considered **less than significant.**

Off-Site Traffic Noise Exposure

Table 3.11-27 provides a summary of the results for the analysis of roadway noise based on existing ADT volumes for each studied roadway segment. The traffic noise levels in Table 3.11-27 are based upon Caltrans ADT traffic volumes and non-passenger car equivalent (PCE) volumes found in Dudek's Transportation Analysis.

Table 3.11-27. Tuolumne Facility Traffic Noise Levels With and Without Project

Street Name	From	To	Noise Level Without Project (CNEL dBA)	Noise Level With Project (CNEL dBA)	Project Increase (CNEL dBA)
Road CR59	SR-120/SR-108	SR-132	62.9	65.2	2.3
SR-120/SR-108	SR-120 /SR-108	Road CR59	74.0	74.0	0.0

Source: Appendix H3.

The inclusion of project operational traffic in the project results in a maximum traffic noise rise of 2.3 dBA along Road CR59 to the west and south of the project site. The anticipated combined traffic noise level, encompassing both existing and project-related traffic, remains below a 3 dBA increase in existing traffic noise levels. Although the predicted traffic noise levels shown in Table 3.11-27 are higher than the 60 dB L_{dn}/CNEL threshold for non-aviation related transportation noise found in Table 3.11-10, a change in noise levels of less than 3 dBA is not perceptible to the average human listener in the context of community noise (i.e., outside of a controlled environment), and existing traffic noise levels are already higher than 60 dB L_{dn}/CNEL based on samples of L_{eq} values appearing in Table 3.11-4. Therefore, project-attributed traffic noise levels would be **less than significant**.

Stationary Noise Sources

Predicted noise exposure levels attributed to concurrent operation of the Tuolumne Facility's onsite stationary sources (i.e., conveyor belts, log collection/transport, debarking, drying, idling haul trucks) as modeled appear in Tables 3.11-28 to 3.11-30. The predicted levels at the studied noise-sensitive receptor locations would not exceed

Tuolumne County's noise threshold as related to stationary noise sources (as shown in Table 3.11-11) when the noise emission of site-adjoining rail operations is not included with onsite project operational noise emission. Additionally, the predicted levels at the studied noise-sensitive receptor locations would not exceed Tuolumne County's transportation-noise threshold (as shown in Table 3.11-10) when the noise emission of site-adjoining rail operations is included with onsite project operational noise emission, as appearing in Tables 3.11-28 to 3.11-30.

Table 3.11-28. Tuolumne Facility – Operation Noise Prediction Model Results (12-Hour Scenario)

Modeled Receptor	Modeled Receptor Distance from Project Boundary	Predicted Operation Noise (dBA hourly L_{eq}) at Indicated Modeled Receptor – With Rail Operations	Predicted Operation Noise (dBA hourly L_{eq}) at Indicated Modeled Receptor – Without Rail Operations
NSR1	1450 ft West	42.3	40.1
NSR2	690 ft East/Southeast	44.6	44.6
NSR3	520 ft East/Southeast	44.9	44.8
NSR4	1750 ft Southeast	40.2	40.1
NSR5	120 ft North	59.7	44.8
NSR6	200ft North	54.7	44.8

* NSR = noise-sensitive receptors; dBA = A-weighted decibels; Leq = energy-averaged noise level

Table 3.11-29. Tuolumne Facility – Operation Noise Prediction Model Results (24-Hour Daytime Hour Scenario)

Modeled Receptor	Modeled Receptor Distance from Project Boundary	Predicted Operation Noise (dBA hourly L_{eq}) at Indicated Modeled Receptor – With Rail Operations	Predicted Operation Noise (dBA hourly L_{eq}) at Indicated Modeled Receptor – Without Rail Operations
NSR1	1450 ft West	42	39.5
NSR2	690 ft East/Southeast	44.1	44
NSR3	520 ft East/Southeast	44.2	44.2
NSR4	1750 ft Southeast	39.6	39.5
NSR5	120 ft North	58.1	44.7
NSR6	200ft North	55.3	44.4

* NSR = noise-sensitive receptors; dBA = A-weighted decibels; Leq = energy-averaged noise level

Table 3.11-30. Tuolumne Facility – Operation Noise Prediction Model Results (24-Hour Nighttime Hour Scenario)

Modeled Receptor	Modeled Receptor Distance from Project Boundary	Predicted Operation Noise (dBA hourly L_{eq}) at Indicated Modeled Receptor – With Rail Operations	Predicted Operation Noise (dBA hourly L_{eq}) at Indicated Modeled Receptor – Without Rail Operations
NSR1	1450 ft West	41.6	38.7
NSR2	690 ft East/Southeast	42.1	42
NSR3	520 ft East/Southeast	42.3	42.2
NSR4	1750 ft Southeast	37.5	37.4
NSR5	120 ft North	55.6	44.5

Table 3.11-30. Tuolumne Facility – Operation Noise Prediction Model Results (24-Hour Nighttime Hour Scenario)

Modeled Receptor	Modeled Receptor Distance from Project Boundary	Predicted Operation Noise (dBA hourly L_{eq}) at Indicated Modeled Receptor – With Rail Operations	Predicted Operation Noise (dBA hourly L_{eq}) at Indicated Modeled Receptor – Without Rail Operations
NSR6	200ft North	53.8	44.5

* NSR = noise-sensitive receptors; dBA = A-weighted decibels; Leq = energy-averaged noise level

As appearing in Tables 3.11-28 to 3.11-30, project stationary operational noise levels would be below Tuolumne County's daytime threshold of 50 dBA hourly L_{eq} and the nighttime threshold of 45 dBA hourly L_{eq}, in each time-scenario where rail operations are not concurrent with project operations. Therefore, potential noise impacts associated with the Tuolumne Facility's operation without rail operations would be considered **less than significant.**

When project-related rail operations occur and add this transportation-type noise source to the without-rail aggregate of stationary noise source emission, the predicted hourly levels appearing in Tables 3.11-28, 3.11-29, and 3.11-30 are less than 60 dBA in magnitude and thus over the course of a 24-hour period would be expected to result in a day-night sound level for the rail operations contribution that is not greater than 60 dBA L_{dn}. Consequently, potential noise impacts associated with the Tuolumne facility's rail operations would be considered **less than significant.**

According to the thresholds established in Table 3.11-12, there would be a significant impact if project operational noise levels would increase outdoor ambient noise levels by 1.5 dBA L_{dn} if existing outdoor ambient noise levels are greater than 65 dBA L_{dn}. When comparing the predicted project operational noise levels to the existing measured outdoor ambient noise levels shown in Table 3.11-4 for Tuolumne County, there would not be an increase in ambient noise levels greater than 1.5 dBA L_{dn}. The measured outdoor ambient noise level at measurement location ST1 is 59.9 dBA L_{eq} or 66.3 dBA L_{dn}, whereas the highest predicted project operational noise level over a 24-hour period is 55.6 dBA L_{eq} or 62.0 dBA L_{dn} (as shown in Table 3.11-30), and therefore lower than the existing measured outdoor ambient noise level at ST1. Additionally, the measured outdoor ambient noise level at measurement location ST2 is 66.1 dBA L_{eq} or 72.5 dBA L_{dn}, which is also lower than the highest predicted project operational noise level over a 24-hour period of 55.6 dBA L_{eq} or 62.0 dBA L_{dn}. Therefore, there would not be a significant increase in the outdoor ambient noise levels according to the Tuolumne County standards as appearing in Table 3.11-12, and this impact would be considered **less than significant**.

Figures 3.11-7 to 3.11-12 correspondingly illustrate (for these same modeled varying operation scenarios) predicted Tuolumne Facility stationary equipment operation sound levels across a horizontal plane approximately five feet above grade (i.e., a first-floor or pedestrian listening elevation) over the Tuolumne Facility site and beyond into the surrounding vicinity.

Transport to Market

Port of Stockton

Short-Term Construction

Table 3.11-31 summarizes the distance of the apparent closest noise-sensitive receptor from the position nearest to the construction site boundary and from the geographic center of the construction site, which serves as the time-

averaged location or geographic *acoustical centroid* of active construction equipment for the phase under study for each of the seven sequential construction phases at the Port of Stockton. At the site boundary, this analysis assumes that only the two loudest pieces of equipment for the listed phase would be involved in construction activity for the 1-hour period. In other words, at such proximity, the operating equipment cannot "stack" or crowd the vicinity and still operate. For the acoustical centroid case, which intends to be a geographic average position for all equipment during the indicated phase, this analysis assumes that all equipment for the indicated activity would be operating in a given hour over the 8-hour assessment period.

Table 3.11-31. Estimated Distances between Construction Activities and the Nearest Noise-Sensitive Receptors – Port of Stockton

Construction Phase (and Equipment Types Involved)	Distance from Nearest Noise-Sensitive Receptor to Construction Site Boundary (Feet)	Distance from Nearest Noise-Sensitive Receptor to Acoustical Centroid of Site (Feet)
Demolition (concrete saw, excavator, tractor)	1240	2500
Site preparation (dozer, backhoe, tractor)	1240	2500
Grading (excavator, grader, dozer, tractor)	1240	2500
Building/Vertical Construction (crane, man-lift, generator, backhoe, welder)	1240	2500
Paving (paver, roller, concrete mixer truck)	1240	2500
Architectural coating (compressor)	1240	2500
Rail Spurs Construction	1240	2500

Based on these two distances, a Microsoft Excel-based noise prediction model emulating and using reference data from the Federal Highway Administration (FHWA) Roadway Construction Noise Model (DOT 2008) was used to estimate construction noise levels at the nearest occupied noise-sensitive land use, for which the results are shown in Table 3.11-32.

Table 3.11-32. Predicted Construction Noise Levels per Activity Phase – Port of Stockton Facility

Construction Phase (and Equipment Types Involved)	8-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	8-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Acoustical Centroid of Site (dBA)
Demolition (concrete saw, excavator, tractor)	52.0	45.8
Site preparation (dozer, backhoe, tractor)	49.6	45.2
Grading (excavator, grader, dozer, tractor)	51.9	44.8

Table 3.11-32. Predicted Construction Noise Levels per Activity Phase – Port of Stockton Facility

Construction Phase (and Equipment Types Involved)	8-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Construction Site Boundary (dBA)	8-Hour L_{eq} at Nearest Noise-Sensitive Receptor to Acoustical Centroid of Site (dBA)
Building/Vertical Construction (crane, man-lift, generator, backhoe, welder)	44.1	39.5
Paving (paver, roller, concrete mixer truck)	46.2	40.4
Architectural coating (compressor)	38.9	31.5
Rail Spurs Construction	n/a	n/a

As presented in Table 3.11-32, the estimated construction noise levels are predicted to reach up to 52.0 dBA 8-hour L_{eq} at the nearest existing residences (as close as 1240 feet away) when the construction of the Port of Stockton's receiving, storage, and loadout facilities takes place near the western project boundaries. Note that these estimated noise levels would occur when noted pieces of heavy equipment would each operate for a full hour at a source-to-receiver distance of 1240 feet. On an average construction workday, heavy equipment will be operating sporadically throughout the project site and more frequently be located away from the southern edge. Hence, at more typical distances closer to the center of the project site (approximately 2500 feet from the nearest existing residence), hourly construction noise exposure levels are estimated to range from approximately 31.5 dBA L_{eq} to 45.8 dBA L_{eq} at the nearest existing residence.

The City of Stockton does not explicitly set forth construction noise standards, and construction noise at the Port of Stockton Facility will not exceed the FTA's recommended 80 dBA L_{eq} 8-hour threshold at the nearest residential receiver. Therefore, temporary construction-related noise impacts would be considered **less than significant.**

Stationary Noise Sources

Predicted noise exposure levels attributed to concurrent operation of the Port of Stockton's onsite stationary sources (i.e., railcar unloading, material transfer facilities, conveyors, and ship loading)) as modeled appear in Table 3.11-33.

Table 3.11-33. Port of Stockton – Operation Noise Prediction Model Results Summary

Modeled Receptor	Modeled Receptor Distance from Project Boundary	Predicted Operation Day/Night Noise level (dBA L_{dn}) at Indicated Modeled Receptor
NSR1	1300 ft North	55.6
NSR2	1100 ft North	55.7
NSR3	1100 ft Northeast	55.0
NSR4	2700 ft East	45.7

* NSR = noise-sensitive receptors; dBA = A-weighted decibels; Leq = energy-averaged noise level

Table 3.11-33 shows that the predicted levels at the studied noise-sensitive receptor locations do not exceed the City of Stockton's 60 dBA L_{dn} noise threshold range as appearing in Table 3.11-13; therefore, potential noise impact associated with project operation would be considered **less than significant.**

Figure 3.11-13 correspondingly illustrates (for this same modeled full operation scenario) predicted Port of Stockton stationary equipment operation sound levels across a horizontal plane approximately five feet above grade (i.e., a first-floor or pedestrian listening elevation) over the Port of Stockton site and beyond into the surrounding vicinity.

Impact NOI-2 The project would not result in generation of excessive groundborne vibration or groundborne noise levels.

Feedstock Acquisition

Sustainable Forest Management Projects

No specific treatment locations have yet been identified in this program-level analysis, and thus the specific location of existing residences or buildings in relation to any particular treatment activities is unknown at this time. Due to the nature of Sustainable Forest Management Project activities, it is likely that many of these activities will occur in remote areas not proximate to sensitive receptors. By way of example, the FTA provides reference groundborne PPV of 0.21 ips for a vibratory roller (a conservative approximation for a masticator) and 0.089 ips for a dozer at distances of 25 feet. Using methods outlined in Section 3.11.5.1, for predicted groundborne vibration velocity levels to be below the Caltrans guidance-based 0.3 ips PPV threshold for avoiding building damage to older residential structures and the 75 VdB guidance limit for annoying building occupant, a vibratory roller would have to operate at a distance of 65 feet or further from a nearby existing residence or building, or 120 feet or further for a dozer. Consequently, because the specific location of existing residences or buildings in relation to Sustainable Forest Management Project activities have not yet been identified and would likely occur in remote areas, impacts associated with such activities are expected to be **less than significant.**

Wood Pellet Production

Lassen Facility

Using the expressions described in Section 3.11.5.1, groundborne vibration velocity levels at the nearest existing residence from the likely most vibratory equipment expected for construction of the Lassen Facility appear in Table 3.11-34. All predicted vibration levels are lower than the occupant annoyance threshold of 75 VdB for "occasional events," per Table 3.11-6, and lower than the building damage risk threshold of 0.3 inches per second PPV.

By way of example, grading at the project site boundary would appear to occur as close as 620 feet to the eastern façade of a western Nubieber residence. At this distance, and using a reference groundborne PPV of 0.21 ips for the roller at a distance of 25 feet, the estimated PPV at the receiving building façade can be estimated as follows:

$$PPV_{rcvr} = 0.21*(25/620)^{1.5} = 0.002 \text{ ips}$$

$$VdB_{rcvr} = 20*LOG(0.002/(4*0.000001)) = 53$$

The predicted groundborne vibration velocity level is below the Caltrans guidance-based 0.3 ips PPV threshold for avoiding building damage to older residential structures, and the corresponding 53 VdB is less than the 75 VdB guidance limit for annoying building occupants.

Subsequent onsite construction activities would involve greater quantities of equipment but would be less vibratory than a roller and/or their distances would be much greater than this six hundred twenty horizontal foot distance between the project site and the nearest residential building façade. Hence, groundborne vibration propagating from these more distant sources of onsite vibration would be substantially less than the preceding estimates and the Caltrans guidance-based vibration exposure thresholds. Therefore, on the basis of compliance with these FTA vibration standards, impacts associated with construction vibration are expected to be **less than significant.**

Table 3.11-34. Predicted Onsite Construction Vibration at Nearest Sensitive Receptor (Lassen Facility)

Studied Receptor (Description)	Anticipated Vibration Source Closest Distance (feet)	Predicted PPV (inches per second) and VdB (rms) for Indicated Equipment Type					
		Dozer		Loader		Roller	
		PPV	VdB	PPV	VdB	PPV	VdB
Nubieber Residence to the West	620	0.0007	45	0.0006	44	0.002	53

Source: FTA 2018.
Notes: VdB = vibration velocity decibels, rms = root mean square, PPV = peak particle velocity.

Tuolumne Facility

The groundborne vibration velocity levels at the nearest existing residence from the likely most vibratory equipment expected for construction of the Tuolumne Facility appear in Table 3.11-35. All predicted vibration levels are lower than the occupant annoyance threshold of 75 VdB for "occasional events," per Table 3.11-6, and lower than the building damage risk threshold of 0.3 inches per second PPV.

By way of example, grading at the project site boundary would appear to occur as close as 120 feet to the southern façade of residence north of the project site. At this distance, and using a reference groundborne PPV of 0.21 ips for the roller at a distance of 25 feet, the estimated PPV at the receiving building façade can be estimated as follows:

$$PPV_{rcvr} = 0.21*(25/120)^{1.5} = 0.02 \text{ ips}$$

$$VdB_{rcvr} = 20*LOG(0.02/(4*0.000001)) = 74$$

The predicted groundborne vibration velocity level is below the Caltrans guidance-based 0.3 ips PPV threshold for avoiding building damage to older residential structures, and the corresponding 74 VdB is less than the 75 VdB guidance limit for annoying building occupants.

Subsequent onsite construction activities would involve greater quantities of equipment but would be less vibratory than a roller and/or their distances would be much greater than this one hundred twenty horizontal foot distance between the project site and the nearest residential building façade. Hence, groundborne vibration propagating from these more distant sources of onsite vibration would be substantially less than the preceding estimates and

the Caltrans guidance-based vibration exposure thresholds. Therefore, on the basis of compliance with these FTA vibration standards, impacts associated with construction vibration are expected to be **less than significant.**

Table 3.11-35. Predicted Onsite Construction Vibration at Nearest Sensitive Receptor (Tuolumne Facility)

Studied Receptor (Description)	Anticipated Vibration Source Closest Distance (feet)	Predicted PPV (inches per second) and VdB (rms) for Indicated Equipment Type					
		Dozer		Loader		Roller	
		PPV	VdB	PPV	VdB	PPV	VdB
Residence to the North	120	0.008	67	0.02	74	0.007	65

Source: FTA 2018.
Notes: VdB = vibration velocity decibels, rms = root mean square, PPV = peak particle velocity.

Transport to Market

Port of Stockton

The groundborne vibration velocity levels at the nearest existing residence from the likely most vibratory equipment expected for construction of the Port of Stockton Facility appear in Table 3.11-36. All predicted vibration levels are lower than the occupant annoyance threshold of 75 VdB for "occasional events," per Table 3.11-6, and lower than the building damage risk threshold of 0.3 inches per second PPV.

By way of example, grading at the project site boundary would appear to occur as close as 1240 feet to the southeastern façade of northeastern residences near Louis Park. At this distance, and using a reference groundborne PPV of 0.21 ips for the roller at a distance of 25 feet, the estimated PPV at the receiving building façade can be estimated as follows:

$$PPV_{rcvr} = 0.21*(25/1240)^{1.5} = 0.0006 \text{ ips}$$

$$VdB_{rcvr} = 20*LOG(0.0006/(4*0.000001)) = 44$$

The predicted groundborne vibration velocity level is below the Caltrans guidance-based 0.3 ips PPV threshold for avoiding building damage to older residential structures, and the corresponding 44 VdB is less than the 75 VdB guidance limit for annoying building occupants.

Subsequent onsite construction activities would involve greater quantities of equipment but would be less vibratory than a roller and/or their distances would be much greater than this one hundred twenty horizontal foot distance between the project site and the nearest residential building façade. Hence, groundborne vibration propagating from these more distant sources of onsite vibration would be substantially less than the preceding estimates and the Caltrans guidance-based vibration exposure thresholds. Therefore, on the basis of compliance with these FTA vibration standards, impacts associated with construction vibration are expected to be **less than significant.**

Table 3.11-36. Predicted Onsite Construction Vibration at Nearest Sensitive Receptor (Port of Stockton Facility)

Studied Receptor (Description)	Anticipated Vibration Source Closest Distance (feet)	Predicted PPV (inches per second) and VdB (rms) for Indicated Equipment Type					
		Dozer		Loader		Roller	
		PPV	VdB	PPV	VdB	PPV	VdB
Residences to the North/Northeast	1240	0.0003	36	0.0006	44	0.0002	35

Source: FTA 2018.
Notes: VdB = vibration velocity decibels, rms = root mean square, PPV = peak particle velocity.

Impact NOI-3 The project is not one that is located within the vicinity of a private airstrip or 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, that would expose people residing or working in the project area to excessive noise levels.

Wood Pellet Production

Lassen Facility

There are no private airstrips within the vicinity of the project site. The closest airport to the project site is Southard Field, approximately 3.8 miles northeast of the site. Therefore, aviation overflight noise exposure would be a **less than significant impact**.

Tuolumne Facility

There are no private airstrips within the vicinity of the project site. The closest airport to the project site is the Oakdale Airport, approximately 17 miles southwest of the site. Therefore, aviation overflight noise exposure would be a **less than significant impact**.

Transport to Market

Port of Stockton

There are no private airstrips within the vicinity of the project site. The closest airport to the project site is the Stockton Metropolitan Airport, approximately 6.25 miles southeast of the site. Therefore, aviation overflight noise exposure would be a **less than significant impact**.

3.11.4.3 Cumulative Impacts

The project would not contribute to cumulative impacts resulting in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Feedstock Acquisition

Sustainable Forest Management Projects

The exact locations, timing, and extent of individual sustainable forest management projects is not feasible to identify at this time, but these projects are anticipated to be geographically disbursed and temporary, and therefore the number of other cumulative projects that would interact with the proposed activities is expected to be limited. Sustainable forest management projects (including, but not limited to, timber harvesting or vegetation management and treatment projects) may necessitate the use of heavy-duty and/or off-road construction or stationary equipment (such as those presented in Tables 3.11-14 and 3.11-16), or may increase off-site traffic (e.g., trucks to haul equipment or crew), thereby potentially increasing ambient noise levels in the vicinity of a respective project. However, such projects are temporary, and occur in a wide geographic area over multiple years; therefore, the cumulative impact of a substantial temporary or permanent increase in ambient noise levels would not be cumulatively considerable.

Wood Pellet Production

Lassen Facility

No cumulative projects were identified relative to the proposed Lassen Facility. The County has no active development applications within Big Valley. No similar projects (such as biomass energy) are proposed within the County (see Chapter 3.0, Section 3.2).

Tuolumne Facility

As discussed in Chapter 3.0, Section 3.2, while there are five (5) projects located near the Tuolumne Facility, noise emission attributed to the Tuolumne Facility's construction propagating towards the surrounding community is predicted to attenuate to sound exposure levels that are compliant with County and FTA standards. Because operations noise from other projects in the studied vicinity would similarly diminish with distance and other environmental effects (e.g., intervening terrain and/or structures, as well as acoustical absorption from porous ground surfaces and the atmosphere), the opportunity for a "cumulatively considerable" effect would be very unlikely.

Additionally, the construction of the projects on the cumulative list would exhibit a low likelihood of a cumulatively considerable effect at a noise-sensitive receiving land use near the Tuolumne Facility. Additionally, such construction activities for these other projects in the vicinity, if and when they occur, would be held to the same applicable standards with respect to construction noise thresholds; and, like operation noise emanating from an active land use, such construction noise attenuates rapidly with distance and due to intervening natural or artificial topography and related effects.

Because operations noise from other projects would similarly diminish with distance and other environmental effects (e.g., intervening terrain and/or structures, as well as acoustical absorption from porous ground surfaces and the atmosphere), as received by a noise-sensitive land use common to one or more of these projects and the Project would be very unlikely.

For the above reasons, the cumulative impact of a substantial temporary or permanent increase in ambient noise levels for the Tuolumne Facility would not be cumulatively considerable.

Transport to Market

Port of Stockton

As discussed in Chapter 3.0, Section 3.2, while there are five (5) projects located near the Port of Stockton Facility, potential construction noise associated with one or more of these other projects would be temporary and, on that basis, correspondingly exhibit a low likelihood of a cumulatively considerable effect at a noise-sensitive receiving land use near the Port of Stockton Facility. Additionally, such construction activities for these other projects in the vicinity, if and when they occur, would be held to the same applicable County and/or City standards with respect to construction noise thresholds; and, like operation noise emanating from an active land use, such construction noise attenuates rapidly with distance and due to intervening natural or artificial topography and related effects.

Additionally, aggregate noise from operating the Port of Stockton Facility propagating towards the surrounding community is predicted to attenuate to a sound level that is compliant with County and City standards. Because operations noise from other projects would similarly diminish with distance and other environmental effects (e.g., intervening terrain and/or structures, as well as acoustical absorption from porous ground surfaces and the atmosphere), the opportunity for a "cumulatively considerable" effect would be very unlikely.

For the above reasons, the cumulative impact of a substantial temporary or permanent increase in ambient noise levels for the Port of Stockton Facility would not be cumulatively considerable.

The project would not contribute to cumulative impacts resulting in generation of excessive groundborne vibration or groundborne noise levels.

Feedstock Acquisition

Sustainable Forest Management Projects

As described for cumulative impact NOI-1, the exact locations, timing, and extent of individual sustainable forest management projects is not feasible to identify at this time, but these projects are anticipated to be geographically disbursed and temporary, and therefore the number of other cumulative projects that would interact with the proposed activities is expected to be limited.. The potential use of heavy-duty and/or off-road construction equipment required for sustainable forest management projects, while potentially causing temporary increases in groundborne vibration or noise levels, would likely take place in a wide range of geographic locations over multiple years. Therefore, the cumulative impact of the generation of excessive groundborne vibration or noise levels would not be cumulatively considerable.

Wood Pellet Production

Lassen Facility

No cumulative projects were identified relative to the proposed Lassen Facility. The County has no active development applications within Big Valley. No similar projects (such as biomass energy) are proposed within the County (see Chapter 3.0, Section 3.2).

Tuolumne Facility

As described for cumulative impact NOI-1, potential groundborne vibration associated with the construction of one or more of the other projects on the cumulative list would be temporary and exhibit a low likelihood of a cumulatively considerable effect at a noise-sensitive receiving land use near the Tuolumne Facility. Additionally, such construction activities for these other projects in the vicinity, if and when they occur, would be held to the same applicable Caltrans and FTA standards with respect to construction vibration thresholds; and, such construction-related groundborne vibration attenuates with distance and due to intervening natural or artificial topography and related effects.

For this reason, the cumulative impact of the generation of excessive groundborne vibration or noise levels at the Tuolumne Facility would not be cumulatively considerable.

Transport to Market

Port of Stockton

As described for cumulative impact NOI-1, potential groundborne vibration associated with the construction of one or more of the other projects on the cumulative list would be temporary and exhibit a low likelihood of a cumulatively considerable effect at a noise-sensitive receiving land use near the Port of Stockton Facility. Additionally, such construction activities for these other projects in the vicinity, if and when they occur, would be held to the same applicable Caltrans and FTA standards with respect to construction vibration thresholds; and, such construction-related groundborne vibration attenuates with distance and due to intervening natural or artificial topography and related effects.

For this reason, the cumulative impact of the generation of excessive groundborne vibration or noise levels at the Port of Stockton Facility would not be cumulatively considerable.

3.11.4.4 Mitigation Measures

Feedstock Acquisition

Sustainable Forest Management Projects

No mitigation measures are required as impacts would be less than significant.

Wood Pellet Production

Lassen Facility

No mitigation measures are required as impacts would be less than significant.

Tuolumne Facility

No mitigation measures are required as impacts would be less than significant.

Transport to Market

Port of Stockton

No mitigation measures are required as impacts would be less than significant.

3.11.4.5 Significance After Mitigation

Potential environmental impacts from the proposed project as studied herein were found to be **less than significant** and not requiring implementation of mitigation measures.

3.11.5 References

Ascent Environmental. 2019. *California Vegetation Treatment Program Final Program Environmental Impact Report.* SCH No. 2019012052. Prepared for CAL FIRE (California Department of Fire and Forestry Protection). November 2019. Accessed March 12, 2024. https://bof.fire.ca.gov/projects-and-programs/calvtp-homepage-and-storymap/

Berger, E.H., R. Neitzel, and C.A. Kladden. 2016. "Noise Navigator Sound Level Database" [Microsoft Excel]. Seattle: University of Washington, Department of Environmental and Occupational Health Services. July 2010.

Caltrans (California Department of Transportation). 2013. *Technical Noise Supplement to the Traffic Noise Analysis Protocol*. Sacramento: Caltrans; Division of Environmental Analysis; Environmental Engineering; Hazardous Waste, Air, Noise, and Paleontology Office. September 2013. Accessed September 7, 2016. https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tens-sep2013-a11y.pdf.

Caltrans. 2020a. *Traffic Noise Analysis Protocol*. Sacramento: Caltrans, Division of Environmental Analysis. April 2020.

Caltrans. 2020b. *Transportation and Construction Vibration Guidance Manual*. Sacramento: Caltrans Division of Environmental Analysis; Environmental Engineering; Hazardous Waste, Air, Noise, and Paleontology Office. April 2020.

Caltrans. 2022. *Traffic Census Program*. 2022. Sacramento: Caltrans; Division of Environmental Analysis; Environmental Engineering; Hazardous Waste, Air, Noise, and Paleontology Office.

City of Stockton. 2018. *Envision Stockton 2040 General Plan*. December 2018. Accessed June 27, 2023. https://cms3.revize.com/revize/stockton/Documents/Business/Planning%20&%20Engineering/General%20Plan/Adopted_Plan.pdf.

County of Tuolumne. 2018. *Tuolumne County General Plan*. December 2018. Accessed February 25, 2022. https://www.tuolumnecounty.ca.gov/889/General-Plan-Update.

DOT (U.S. Department of Transportation). 2006. *FHWA Roadway Construction Noise Model: User's Guide*. Final Report. FHWA-HEP-06-015; DOT-VNTSC-FHWA-06-02. Cambridge, Massachusetts: DOT, Research and Innovative Technology Administration. August 2006.

DOT. 2008. Roadway Construction Noise Model (RCNM), Software Version 1.1. Washington, DC: U.S. Department of Transportation, Research and Innovative Technology Administration, John A. Volpe National Transportation Systems Center, Environmental Measurement and Modeling Division. December 8, 2008. https://www.fhwa.dot.gov/environment/noise/construction_noise/rcnm/.

EPA (U.S. Environmental Protection Agency). 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. EPA, Office of Noise Abatement and Control. March 1974.

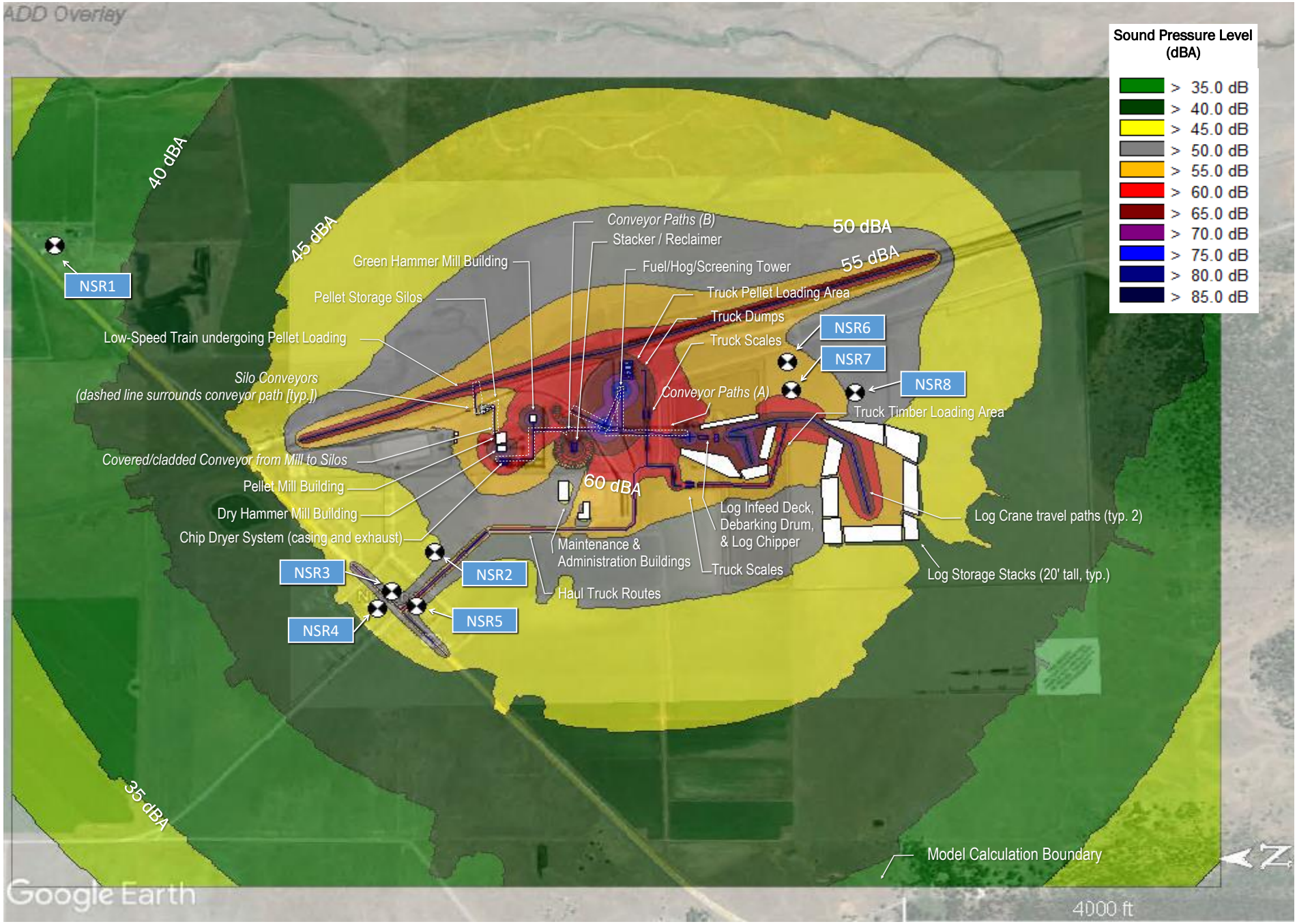
FHWA (Federal Highway Administration). 2011. *Highway Traffic Noise: Analysis and Abatement Guidance*. FHWA-HEP-10-025. December 2011.

FTA (Federal Transit Administration). 2018. *Transit Noise and Vibration Impact Assessment*. FTA Report No. 0123. September 2018.

ISO (International Organization of Standardization). 1996. "Acoustics—Attenuation of Sound During Propagation Outdoors—Part 2: General Method of Calculation." ISO 9613-2. December 1996. Accessed November 2, 2023. https://www.iso.org/standard/20649.html.

Lassen County. 1999. *Lassen County General Plan 2000.* September 1999. Accessed February 28, 2022. http://www.lassencounty.org/government/resources/planning-and-building-services.

Lassen County. 2021. *Draft Initial Study & Negative Declaration – Lassen County Noise Element Update and Noise Ordinance.* July 2021. Prepared by Dudek. Accessed April 27, 2022. https://co.lassen.ca.us/sites/default/files/departments/planning_and_building_services/planning_docs/Draft%20Initial%20Study%20(Signed%20Copy).pdf.



SOURCE: GSNR 2023; Dudek 2023

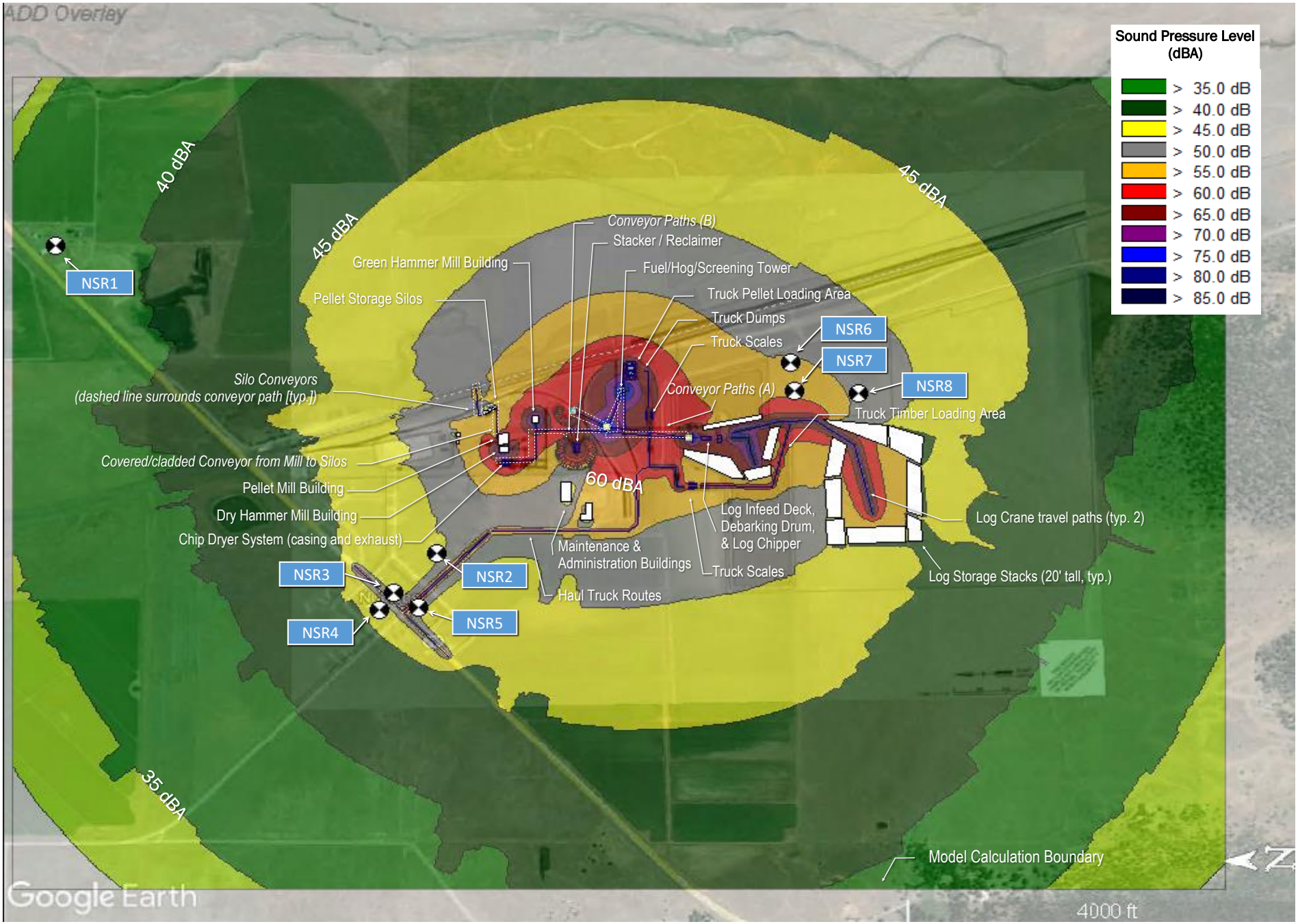
DUDEK

0 646.5 1293 Feet

FIGURE 3.11-1

Predicted Overall Operation Noise Levels - 12 hr with Rail Pellet Loading - Lassen

INTENTIONALLY LEFT BLANK



SOURCE: GSNR 2023; Dudek 2023

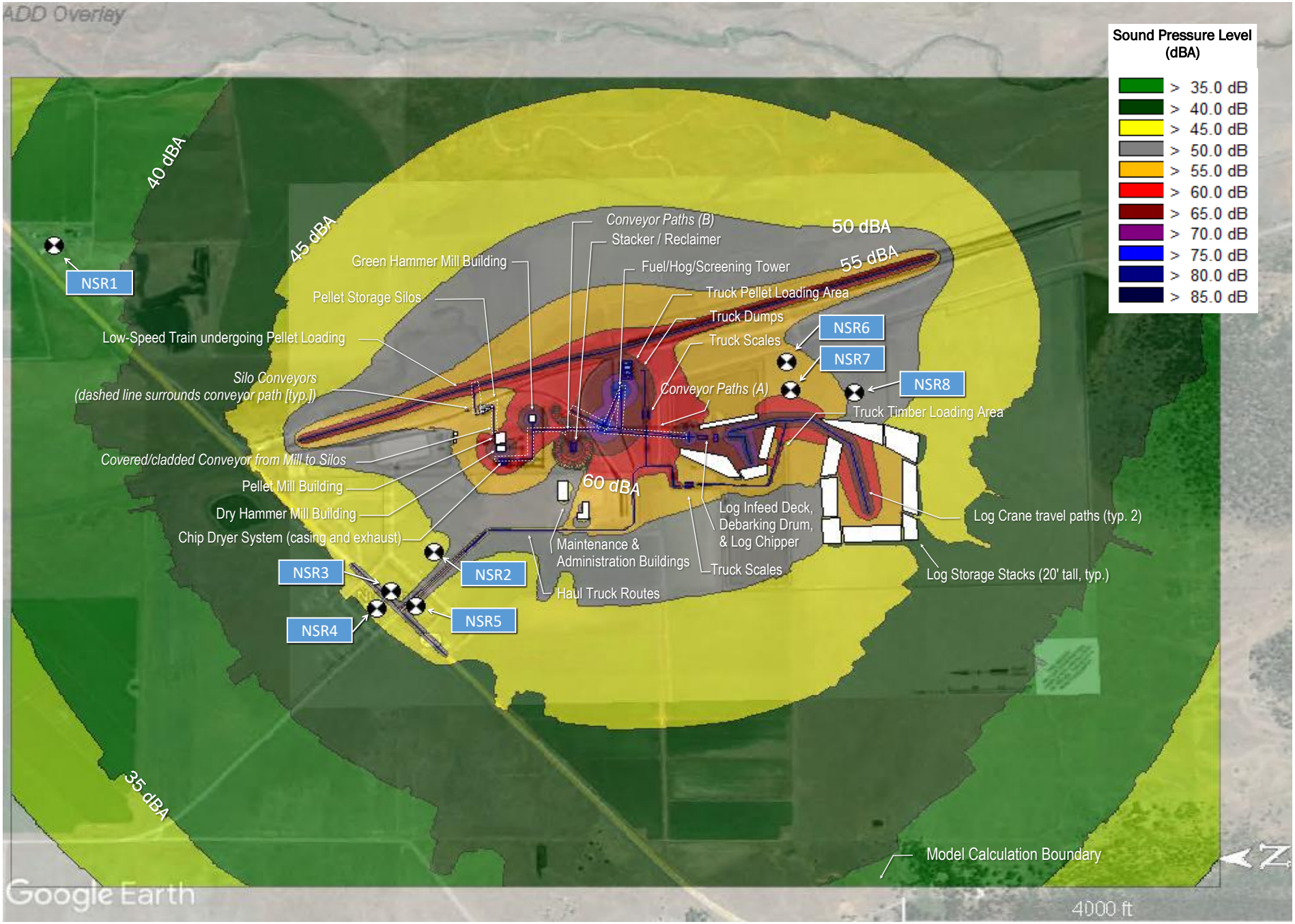
DUDEK

0 646.5 1293 Feet

FIGURE 3.11-2

Predicted Overall Operation Noise Levels - 12 hr without Rail Pellet Loading - Lassen

INTENTIONALLY LEFT BLANK



SOURCE: GSNR 2023; Dudek 2023

DUDEK

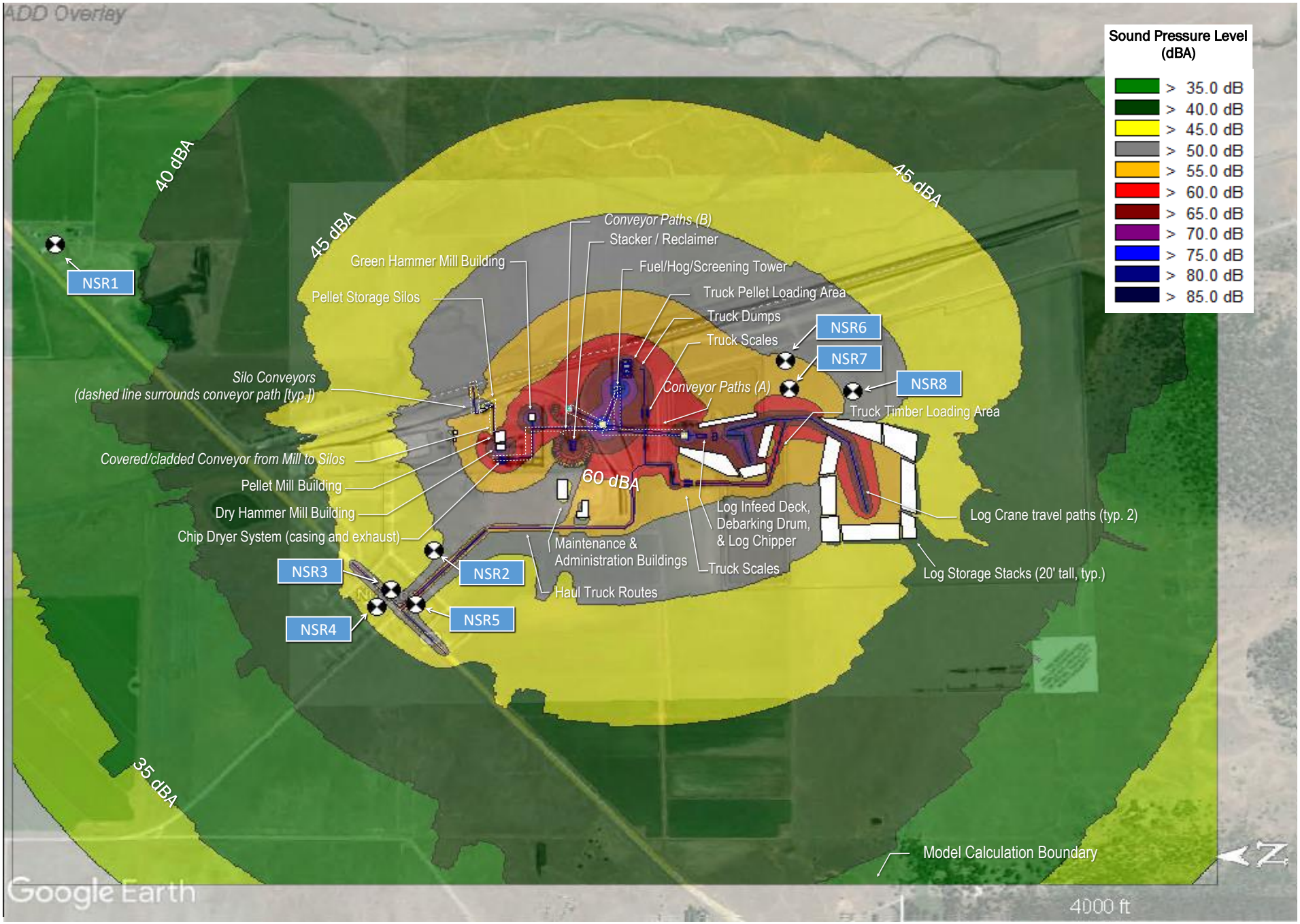
0 646.5 1293 Feet

FIGURE 3.11-3

Predicted Overall Operation Noise Levels - 24 hr Daytime with Rail Pellet Loading - Lassen

Golden State Natural Resources - Forest Resiliency Program Project (Dudek No. 12335)

INTENTIONALLY LEFT BLANK



SOURCE: GSNR 2023; Dudek 2023

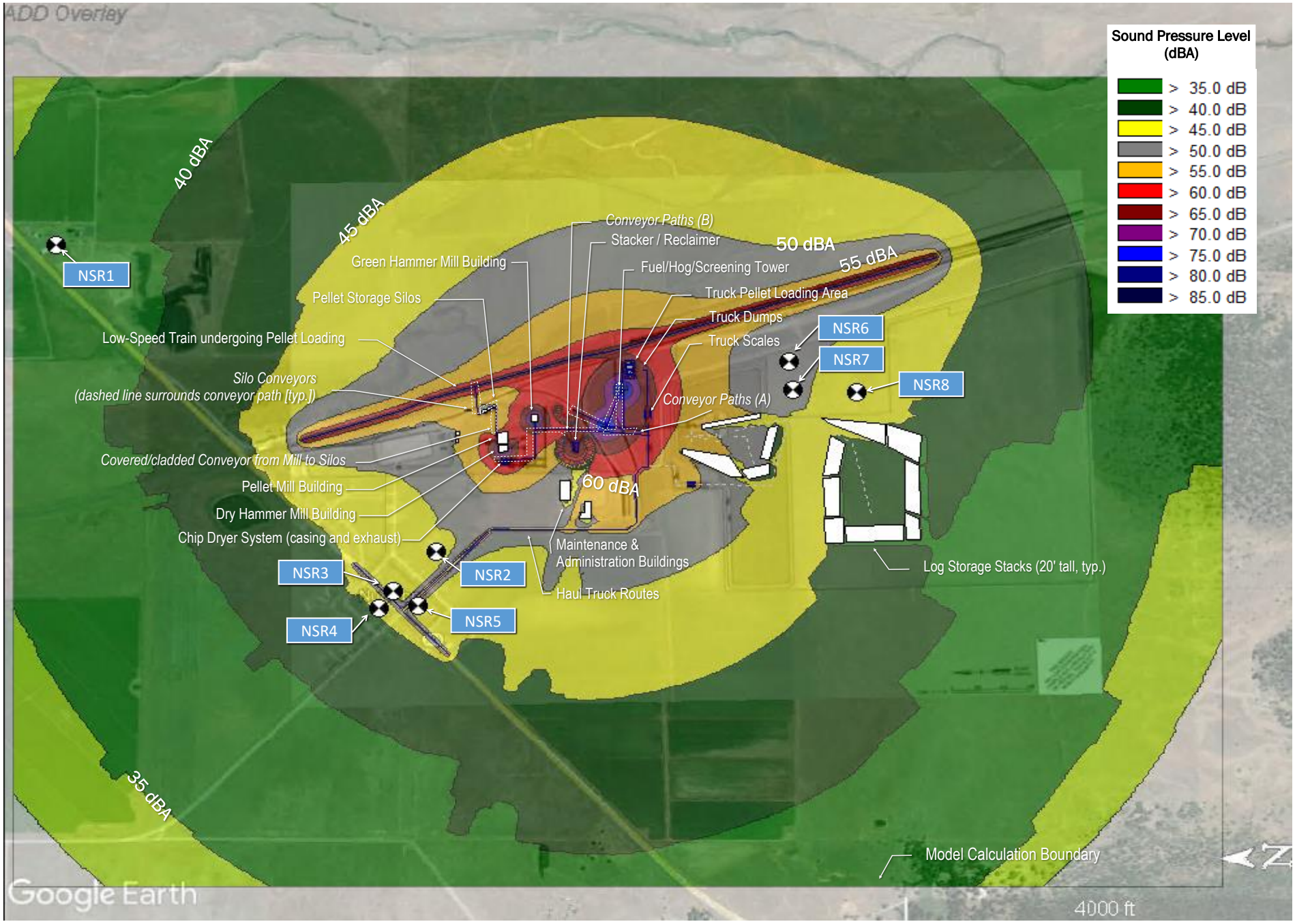
DUDEK

0 646.5 1293 Feet

FIGURE 3.11-4

Predicted Overall Operation Noise Levels - 24 hr Daytime without Rail Pellet Loading - Lassen

INTENTIONALLY LEFT BLANK



SOURCE: GSNR 2023; Dudek 2023

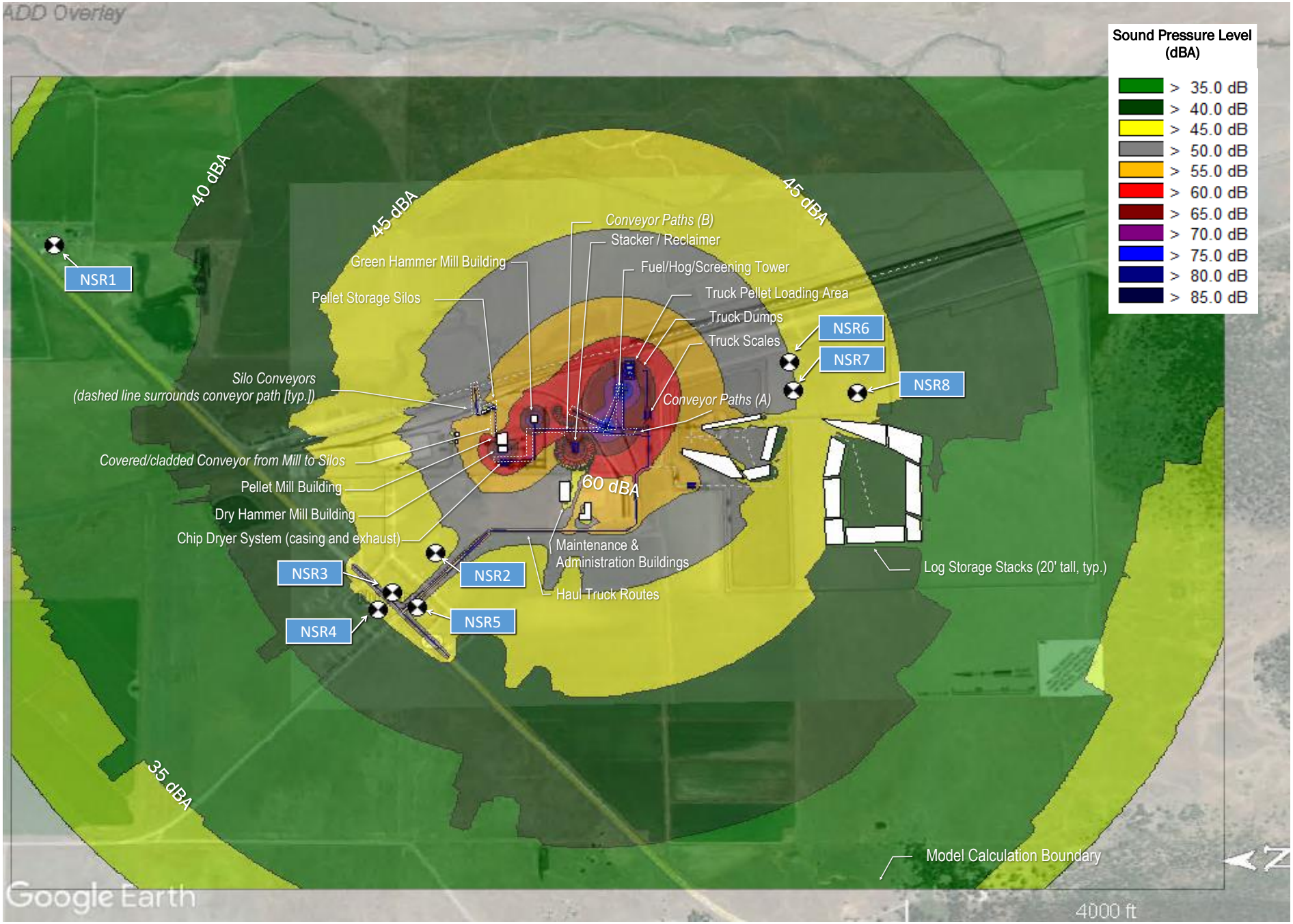
DUDEK

0 646.5 1293 Feet

FIGURE 3.11-5

Predicted Overall Operation Noise Levels - 24 hr Nighttime with Rail Pellet Loading - Lassen

INTENTIONALLY LEFT BLANK



SOURCE: GSNR 2023; Dudek 2023

DUDEK

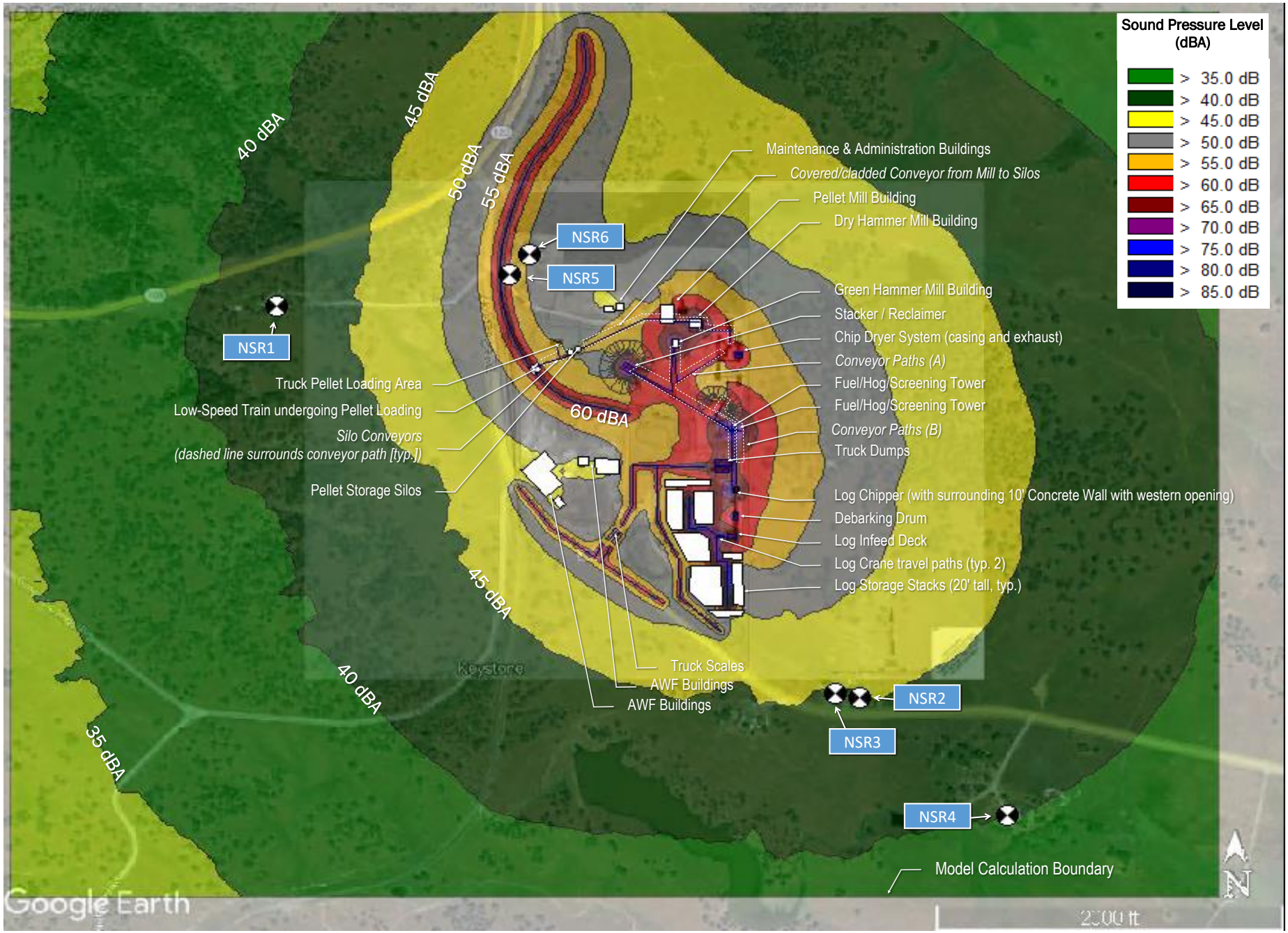
0 646.5 1293 Feet

FIGURE 3.11-6

Predicted Overall Operation Noise Levels - 24 hr Nighttime without Rail Pellet Loading - Lassen

Golden State Natural Resources - Forest Resiliency Program Project (Dudek No. 12335)

INTENTIONALLY LEFT BLANK



SOURCE: GSNR 2023; Dudek 2023

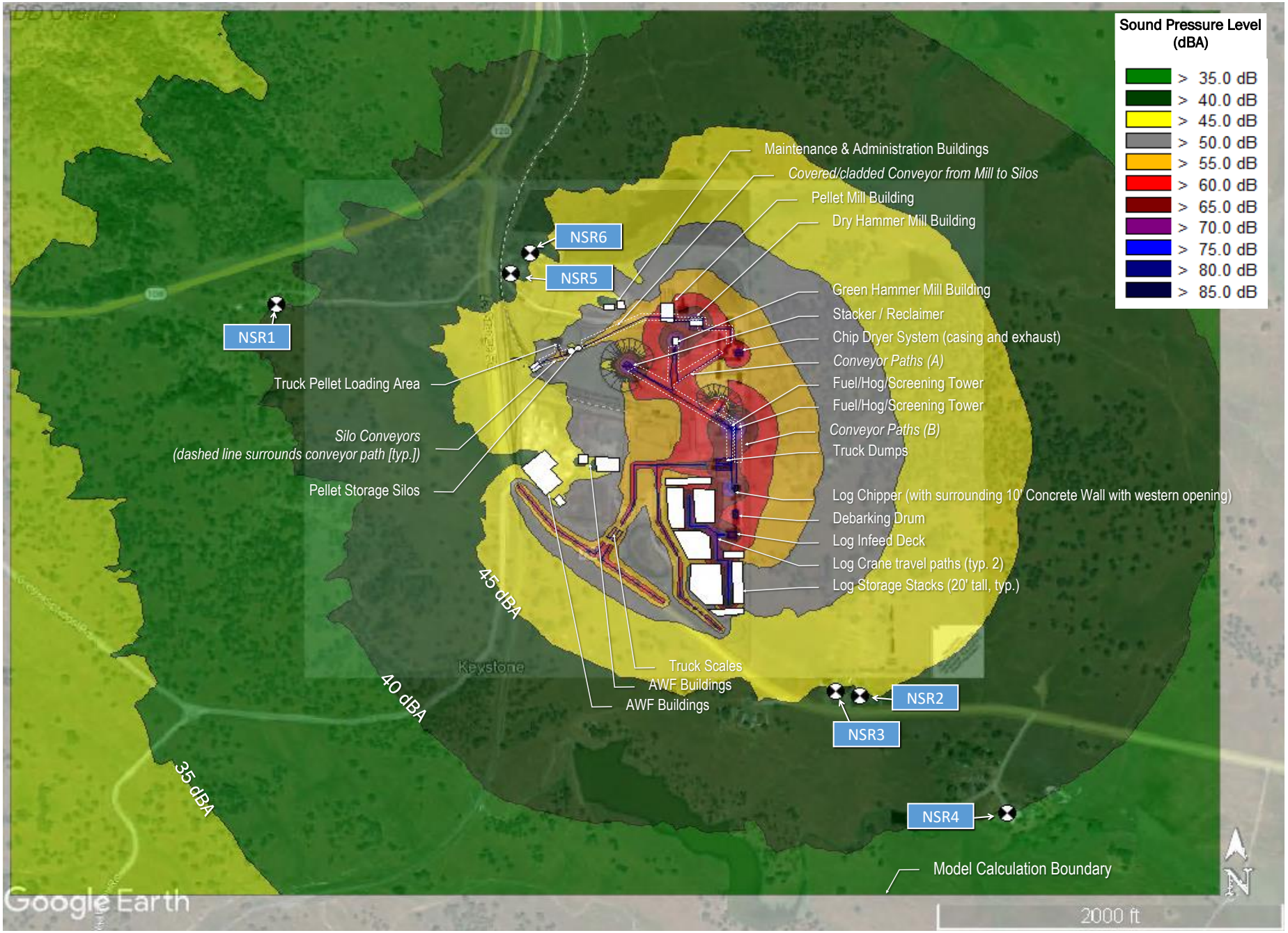
DUDEK

0 364 728 Feet

FIGURE 3.11-7

Predicted Overall Operation Noise Levels - 12 hr with Rail Pellet Loading - Tuolumne

INTENTIONALLY LEFT BLANK



SOURCE: GSNR 2023; Dudek 2023

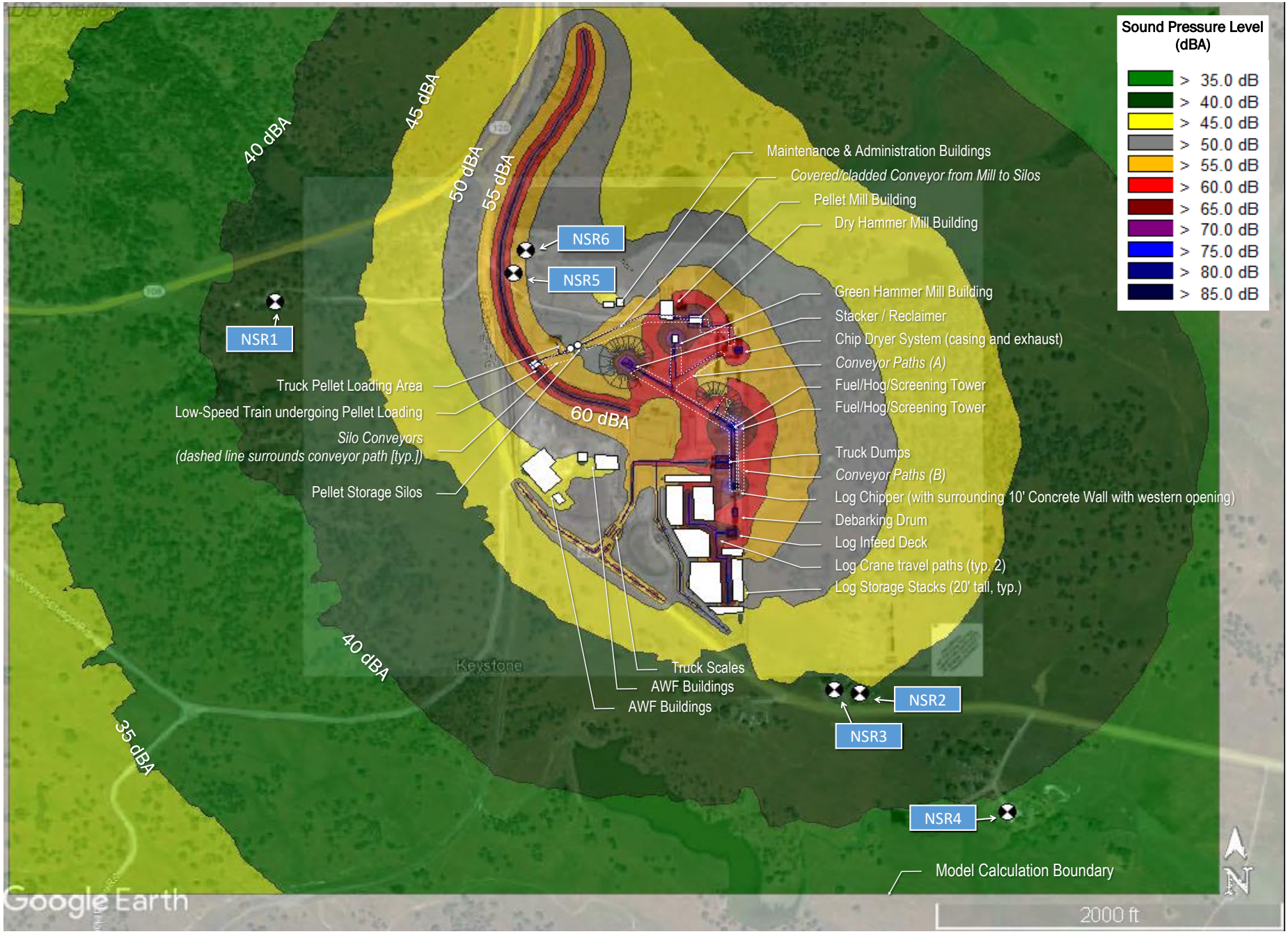
DUDEK

0 364 728 Feet

FIGURE 3.11-8

Predicted Overall Operation Noise Levels - 12 hr without Rail Pellet Loading - Tuolumne

INTENTIONALLY LEFT BLANK



SOURCE: GSNR 2023; Dudek 2023

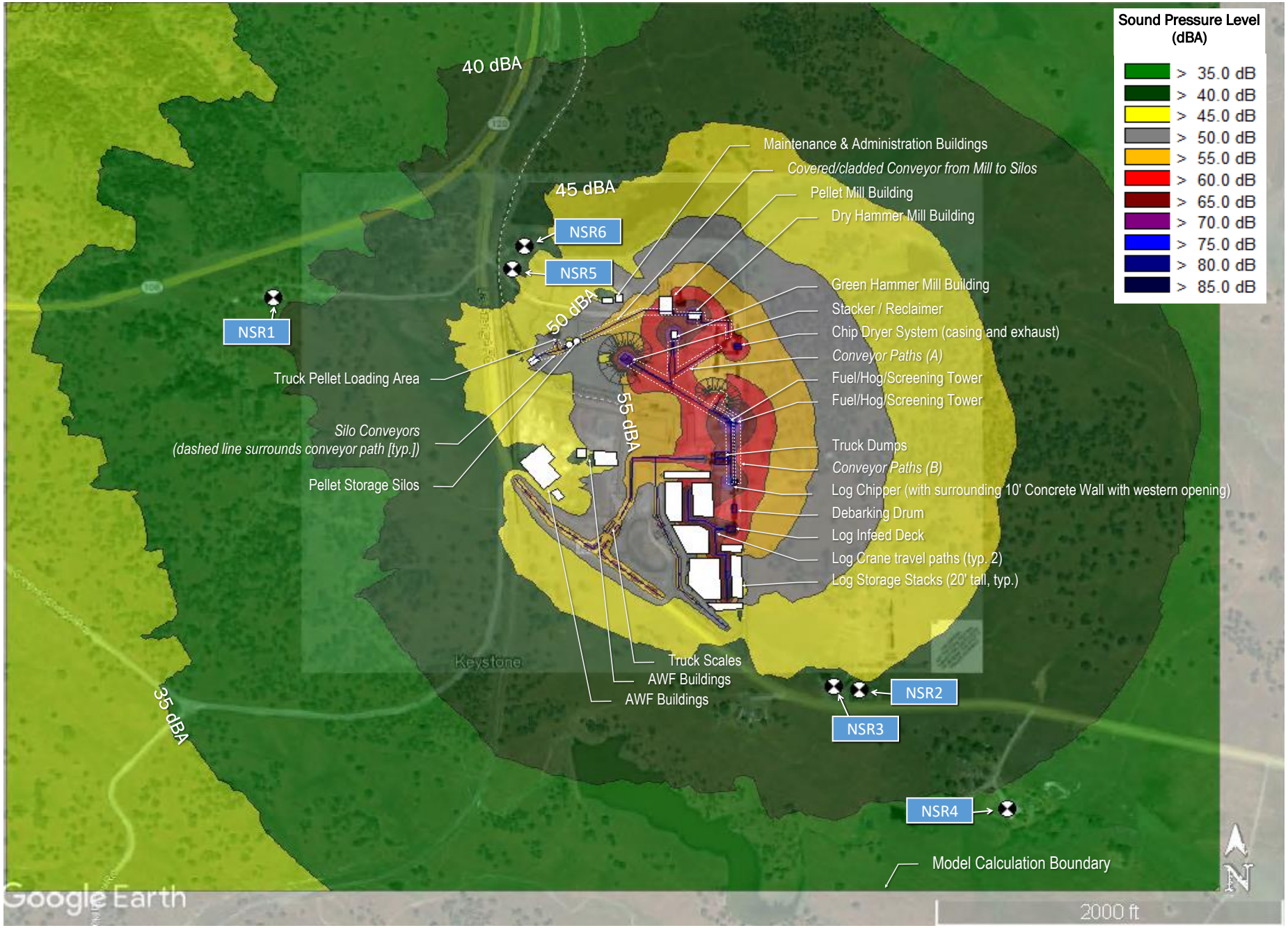
DUDEK

0 364 728 Feet

FIGURE 3.11-9

Predicted Overall Operation Noise Levels - 24 hr Daytime with Rail Pellet Loading - Tuolumne

INTENTIONALLY LEFT BLANK



SOURCE: GSNR 2023; Dudek 2023

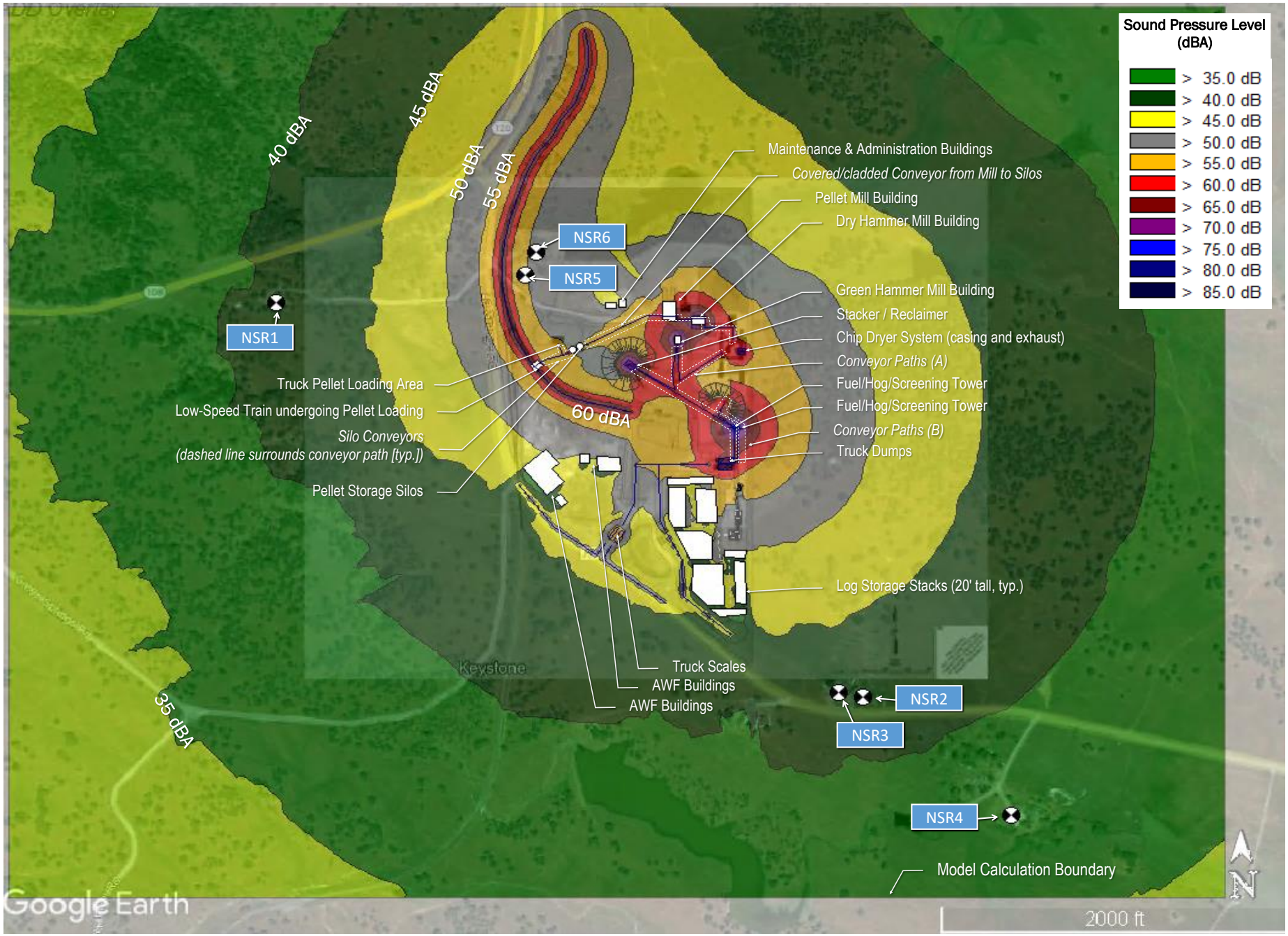
DUDEK

0 364 728 Feet

FIGURE 3.11-10

Predicted Overall Operation Noise Levels - 24 hr Daytime without Rail Pellet Loading - Tuolumne

INTENTIONALLY LEFT BLANK



SOURCE: GSNR 2023; Dudek 2023

DUDEK

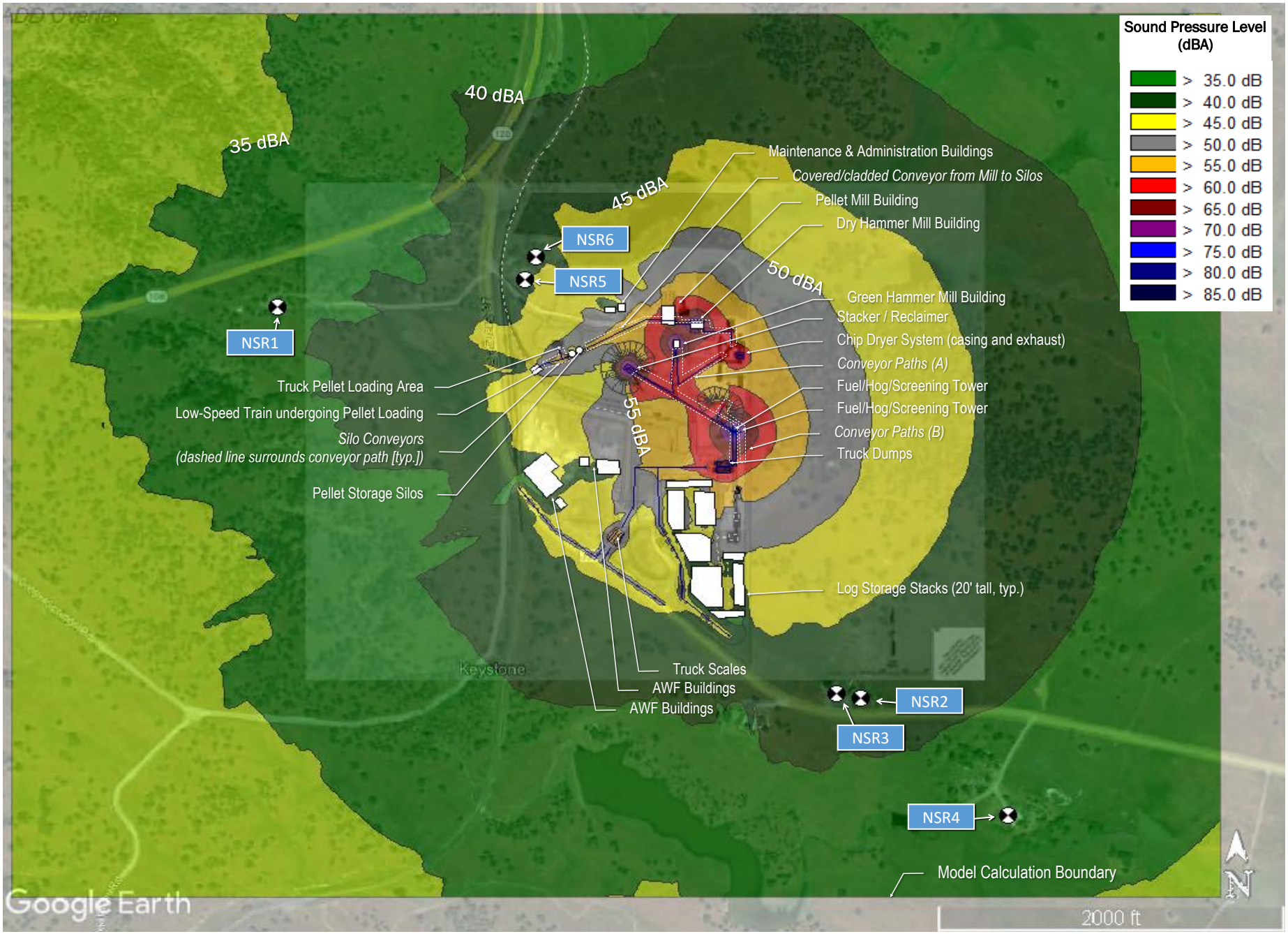
0 364 728 Feet

FIGURE 3.11-11

Predicted Overall Operation Noise Levels - 24 hr Nighttime with Rail Pellet Loading - Tuolumne

Golden State Natural Resources - Forest Resiliency Program Project (Dudek No. 12335)

INTENTIONALLY LEFT BLANK



SOURCE: GSNR 2023; Dudek 2023

DUDEK

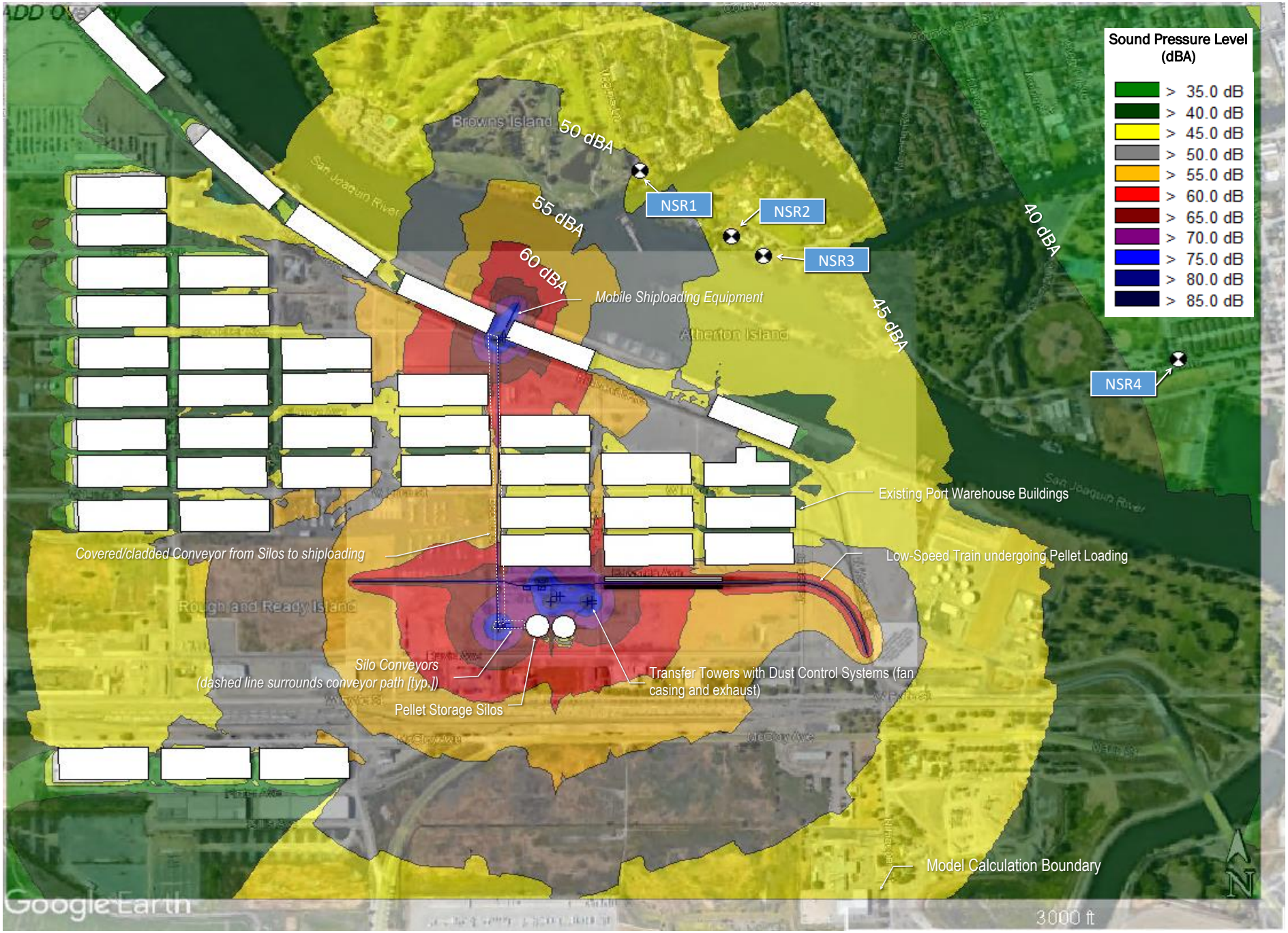
0 364 728 Feet

FIGURE 3.11-12

Predicted Overall Operation Noise Levels - 24 hr Nighttime without Rail Pellet Loading - Tuolumne

Golden State Natural Resources - Forest Resiliency Program Project (Dudek No. 12335)

INTENTIONALLY LEFT BLANK



SOURCE: GSNR 2023; Dudek 2023

DUDEK

0 485 970 Feet

FIGURE 3.11-13

Predicted Overall Operation Noise Levels - Port of Stockton

Golden State Natural Resources - Forest Resiliency Program Project (Dudek No. 12335)

INTENTIONALLY LEFT BLANK