3.11 - Noise

3.11.1 - Introduction

This section describes the existing noise setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on noise modeling performed by Michael Brandman Associates. The noise modeling output is included in this EIR as Appendix G.

3.11.2 - Environmental Setting

Noise Fundamentals

Noise is defined as unwanted sound. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm, or when it has adverse effects on health. Sound is produced by the vibration of sound pressure waves in the air. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels. The decibel (dB) is a logarithmic unit that expresses the ratio of the sound pressure level being measured to a standard reference level. A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating between very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies that are audible to the human ear. The scale value of zero is the threshold of human hearing.

Noise Descriptors

Community noise is commonly described in terms of the "ambient" noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state, A-weighted sound level containing the same total energy as a time-varying signal over a given time period (usually 1-hour). The L_{eq} is the foundation of the composite noise descriptor, Day-Night Average Level (L_{dn}), and shows very good correlation with community response to noise.

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

Noise in the community has often been cited as being a health problem, not in terms of actual physiological damages such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities such as sleep, speech, recreation, and tasks demanding concentration or coordination. When community noise interferes with human activities or contributes to stress, public annoyance with the noise source increases, and the acceptability of the environment

for people decreases. This result is the bases for land use planning policies preventing exposures to excessive community noise levels.

In addition to the A-weighted noise level, other factors should be considered in establishing criteria for noise sensitive land uses. For example, sounds with noticeable tonal content such as whistles, horns, droning or high-pitched sounds may be more annoying than the A-weighted sound level alone suggests. Many noise standards apply a penalty or correction of 5 dBA to such sounds. The effects of unusual tonal content are generally more of a concern at nighttime when residents may notice the sound in contrast to low levels of ambient/background noise.

Because many rural residential areas experience very low noise levels, residents may express concern about the loss of "peace and quiet" due to the introduction of a sound that was not previously audible. In very quiet environments, the introduction of virtually any change in local activities will cause an increase in noise levels. A change in noise level and the loss of "peace and quiet" is the inevitable result of land use or activity changes in such areas. Audibility of a new noise source and/or increases in noise levels within recognized acceptable limits are not usually considered significant noise impacts, but these concerns should be addressed and considered in the planning and environmental review processes.

Noise Mitigation Fundamentals

Any noise problem may be considered as being composed of three basic elements: the noise source, a transmission path, and a receiver. The appropriate acoustical treatment for a given project should consider the nature of the noise source and the sensitivity of the receiver. The problem should be defined in terms of appropriate criteria (L_{dn}, L_{eq}, or L_{max}), the location of the sensitive receiver (inside or outside), and when the problem occurs (daytime or nighttime). Noise control techniques should then be selected to provide an acceptable noise environment for the receiving property while remaining consistent with local aesthetic standards and practical structural and economic limits. Fundamental noise control techniques include the following:

Use of Setbacks

Noise exposure may be reduced by increasing the distance between the noise sources and receiving use. Setback areas can take the form of open space, frontage roads, recreational areas, storage yards, etc. The available noise attenuation from this technique is limited by the characteristics of the noise source, but is generally about 4 to 6 dB per doubling of distance from the source.

Use of Barriers

Shielding by barriers can be obtained by placing walls, berms, or other structures, such as buildings, between the noise source and the receiver. The effectiveness of a barrier depends upon blocking line-of-sight between the source and receiver, and is improved with increasing the distance the sound must travel to pass over the barrier as compared to a straight line from source to receiver. The difference

between the distance over a barrier and a straight line between source and receiver is called the "path length difference," and is the basis for calculating barrier noise reduction.

Barrier effectiveness depends upon the relative heights of the source, barrier, and receiver. In general, barriers are most effective when placed close to either the receiver or the source. An intermediate barrier location yields a smaller path-length-difference for a given increase in barrier height than does a location closer to either source or receiver.

For maximum effectiveness, barriers must be continuous and relatively airtight along their length and height. To ensure that sound transmission through the barrier is insignificant, barrier mass should be about 4 pounds per square foot, although a lesser mass may be acceptable if the barrier material provides sufficient transmission loss. Satisfaction of the above criteria requires substantial and well-fitted barrier materials, placed to intercept line of sight to all significant noise sources. Earth, in the form of berms or the face of a depressed area, is also an effective barrier material.

The attenuation provided by a barrier depends upon the frequency content of the source. Generally, higher frequencies are attenuated (reduced) more readily than lower frequencies. This results because a given barrier height is relatively large compared to the shorter wavelengths of high frequency sounds, while relatively small compared to the longer wavelengths of the frequency sounds. The effective center frequency for traffic noise is usually considered to be 550 Hz. Railroad engines, cars, and horns emit noise with differing frequency content, so the effectiveness of a barrier will vary for each of these sources. Frequency analyses are necessary to properly calculate barrier effectiveness for noise from sources other than highway traffic.

There are practical limits to the noise reduction provided by barriers. For highway traffic noise, a 5- to 10-dB noise reduction may often be reasonably attained. A 15-dB noise reduction is sometimes possible, but a 20-dB noise reduction is extremely difficult to achieve. Barriers usually are provided in the form of walls, berms, or berm/wall combinations. The use of an earth berm in lieu of a solid wall may provide up to 3 dB additional attenuation over that attained by a solid wall alone, due to the absorption provided by the earth. Berm/wall combinations offer slightly better acoustical performance than solid walls, and are often preferred for aesthetic reasons.

Use of Vegetation

Trees and other vegetation are often thought to provide significant noise attenuation. However, approximately 100 feet of dense foliage (so that no visual path extends through the foliage) is required to achieve a 5-dB attenuation of traffic noise. Thus, the use of vegetation as a noise barrier should not be considered a practical method of noise control unless large tracts of dense foliage are part of the existing landscape.

Vegetation can be used to acoustically "soften" intervening ground between a noise source and receiver, increasing ground absorption of sound and thus increasing the attenuation of sound with

distance. Planting of trees and shrubs is also of aesthetic and psychological value, and may reduce adverse public reaction to a noise source by removing the source from view, even though noise levels will be largely unaffected. It should be noted, however, that trees planted on the top of a noise control berm can actually degrade the acoustical performance of the barrier slightly. This effect can occur when high-frequency sounds are diffracted (bent) by foliage and directed downward over a barrier.

In summary, the effects of vegetation upon noise transmission are minor, and are primarily limited to increased absorption of high-frequency sounds and to reducing adverse public reaction to the noise by providing aesthetic benefits.

Grasslands Site

The Grasslands site is located at 30475 County Road 104, in an unincorporated area of Yolo County, approximately 2.5 miles south of Davis, California. Noise in the vicinity of the site is attributable primarily to vehicle noise on local roadways, but also to existing agricultural operations in the project area. The Grasslands site consists of approximately 41 acres within Yolo County's Grasslands Regional Park at the southeastern corner of the intersection of Mace Boulevard/County Road 104 and County Road 35 (Exhibit 2-2). The Grasslands site is generally bounded by County Road 35 and agricultural land (north), Grasslands Regional Park (east), Yolo Bowmen Archery Range and Sacramento Valley Soaring Society Flying Field (south), and Mace Boulevard/County Road 104 and agricultural land (west).

Beamer/Cottonwood Site

The Beamer/Cottonwood site is located at southeastern corner of Ashley Drive and Woodland Avenue in the City of Woodland (Exhibit 2-3). The Beamer/Cottonwood site consists of approximately 6.53 acres of undeveloped land (Exhibit 2-5). The Beamer/Cottonwood site is generally bounded by Woodland Avenue and a residential neighborhood (north), Yolo County Health Department building (east), Yolo County Department of Employment and Social Services building and JPA building (southeast), the County Corporation Yard (south), and Ashley Drive and a residential neighborhood (west). At the project site, noise in the vicinity is attributable primarily to vehicle noise on local roadways.

3.11.3 - Regulatory Framework

State

Noise Standards

Established in 1973, the California Department of Health Services Office of Noise Control was instrumental in developing regularity tools to control and abate noise for use by local agencies. One significant model is the "Land Use Compatibility for Community Noise Environments Matrix," which allows the local jurisdiction to clearly delineate compatibility of sensitive uses with various incremental levels of noise, which is included in Appendix G.

Title 24, Chapter 1, Article 4 of the California Administrative Code (California Noise Insulation Standards) requires noise insulation in new hotels, motels, apartment houses, and dwellings (other than single-family detached housing) that provides an annual average noise level of no more than 45 dBA community noise equivalent level (CNEL). When such structures are located within a 60-dBA CNEL (or greater) noise contour, an acoustical analysis is required to ensure that interior levels do not exceed the 45-dBA CNEL annual threshold. In addition, Title 21, Chapter 6, Article 1 of the California Administrative Code requires that all habitable rooms, hospitals, convalescent homes, and places of worship shall have an interior CNEL of 45 dB or less due to aircraft noise.

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

Single-Event Noise Level (SEL) Descriptors

Noise is rarely regulated by SEL descriptors. The SEL descriptor represents the acoustic energy of a single event normalized to a 1-second event duration, while L_{dn} and CNEL represent the weighted average of the intensity of noise over a 24-hour period, with adjustments for nighttime noise sensitivity.

However, the courts have indirectly recognized SEL limits for unique circumstances such as sleep disturbance from aircraft overflights (e.g., *Berkeley Keep Jets Over the Bay Com. V. Bd of Port Comrs. of Oakland*, 91 Cal. App. 4th 1344 [2001]). In the Berkeley decision, the court held that impacts to sleep disturbance should be analyzed using the SEL descriptor, in addition to analyzing the L_{dn} or CNEL noise impacts. The ruling did not recommend a specific SEL noise threshold for sleep disturbance. A threshold for sleep disturbance is not absolute, since a high degree of variability exists from one person to another. As a result, no government agencies have suggested what frequencies of awakenings are acceptable. For these reasons, the Federal Interagency Committee on Noise and the California Airport and Land Use Planning Handbook continue to use L_{dn} or CNEL as the primary tool for land use compatibility planning and do not establish SEL standards. Since the L_{dn} and CNEL represent the cumulative exposure to all single events—that is, the exposure of all SELs taken together, weighed to add penalties for nighttime occurrences and averaged over a 24-hour period—the L_{dn} and CNEL-based standards already account for the individual impacts associated with SELs.

Vibration Standards

Title 14 of the California Administrative Code Section 15000 requires that all state and local agencies implement the California Environmental Quality Act (CEQA) Guidelines, which requires the analysis of exposure of persons to excessive groundborne vibration. However, no statute has been adopted by the state that quantifies the level at which excessive groundborne vibration occurs.

Caltrans issued the Transportation- and Construction-Induced Vibration Guidance Manual in 2004. The manual provides practical guidance to Caltrans engineers, planners, and consultants who must address vibration issues associated with the construction, operation, and maintenance of Caltrans projects. However, this manual is also used as a reference point by many lead agencies and CEQA practitioners throughout California, as it provides numeric thresholds for vibration impacts. Thresholds are established for continuous (construction-related) and transient (transportation-related) sources of vibration, which found that the human response becomes distinctly perceptible at 0.25 inch per second PPV for transient sources and 0.04 inch per second PPV for continuous sources.

A vibration impact would be generally considered significant if it involves any construction-related or operations-related impacts in excess of 0.05 inches per second RMS vertical velocity at the nearby sensitive receptors (0.035 inches per second is barely perceptible).

Local

County of Yolo

General Plan

The General Plan establishes the following goals and policies associated with noise that are applicable to the proposed project:

- **Policy HS-7.1:** Ensure that existing and planned land uses are compatible with the current and projected noise environment. However, urban development generally experiences greater ambient (background) noise than rural areas. Increased density, as supported by the County in this General Plan, generally results in even greater ambient noise levels. It is the County's intent to meet specified indoor noise thresholds, and to create peaceful backyard living spaces where possible, but particular ambient outdoor thresholds may not always be achievable. Where residential growth is allowed pursuant to this general plan, these greater noise levels are acknowledged and accepted, notwithstanding the guidelines in Figure HS-7.
- **Policy HS-7.2:** Ensure the compatibility of permitted land use activities within the Primary Delta Zone with applicable noise policies of the Land Use and Resource Management Plan of the Delta Protection Commission.
- **Policy HS-7.3:** Protect important agricultural, commercial, industrial, and transportation uses from encroachment by land uses sensitive to noise and air quality impacts.
- **Policy HS-7.4:** For proposed new discretionary development, where it is not possible to reduce noise levels in outdoor activity areas to 60 dB CNEL or less using practical application of the best-available noise reduction measures, greater exterior noise levels may be allowed, provided that all available reasonable and feasible exterior noise level reduction measures have been implemented.
- **Policy HS-7.5:** Minimize the impact of noise from transportation sources including roads, rail lines, and airports on nearby sensitive land uses.

- **Policy HS-7.6:** Support improvements to at-grade crossings to eliminate the need for train whistle blasts in, near, or through communities.
- **Policy HS-7.7:** Encourage railroad companies to adopt operational strategies that reduce the potential for noise and interrupted traffic flow.
- **Policy HS-7.8:** Encourage local businesses to reduce vehicle and equipment noise through fleet and equipment modernization or retrofits, use of alternative fuel vehicles and installation of mufflers or other noise reducing equipment.

City of Woodland

General Plan

The General Plan establishes the following goals and policies associated with public that are applicable to the proposed project:

- **Policy 8.G.1:** The City shall prohibit development of new noise-sensitive uses where the noise level due to non-transportation noise sources will exceed the noise level standards of Table 8-1 [Table 3.11-1] as measured immediately within the property line of the new development, unless effective noise mitigation measures have been incorporated into the development design to achieve the standards set out in Table 8-1 [Table 3.11-1].
- **Policy 8.G.2:** The City shall require that noise created by new non-transportation sources be mitigated so as not to exceed the noise level standards of Table 8-1 [Table 3.11-1] as measured immediately within the property line of lands designated for noise-sensitive uses.

Table 3.11-1: Noise Level Performance Standards for Residential Areas Affected By Non-Transportation Noise[1]

Statistical Noise Level Descriptor	Exterior Noise Level Standards (dBA)	
	Daytime 7 a.m. to 10 p.m.	Nighttime 10 p.m. to 7 a.m.
L_{50}	50	45
L_{max}	70	65

Notes:
[1] For the purposes of compliance with the provisions of this section, the City defines transportation noise sources as traffic on public roadways, railroad line operations, and aircraft in flight. Control of noise from these sources is preempted by Federal and State regulations. Other noise sources are presumed to be subject to local regulations. Non-transportation noise sources may include industrial operations, outdoor recreation facilities, HVAC units, and loading dock.

- **Policy 8.G.3:** The City shall not require existing dwellings and new single-family dwellings to comply with the standards set out in Table 8-1 [Table 3.11-1]. As a consequence, such dwellings may be located in areas where noise levels exceed these standards and it shall not be the responsibility of the City to ensure that such dwellings meet these standard or the noise standards imposed by lending agencies such as HUD, FHA and Cal Vet. If homes are located and constructed in accordance with the policies and standards in Table 8-1 [Table 3.11-1], it is

expected that the resulting exterior and interior noise levels will conform to the HUD/FHA/Cal Vet noise standards.

- **Policy 8.G.4:** Where proposed non-residential land uses are likely to produce noise levels exceeding the performance standards of Table 8-1 [Table 3.11-1] at existing or planned noise-sensitive uses, the City shall require an acoustical analysis as part of the environmental review process so that noise mitigation may be included in the project design. The acoustical analysis shall meet the following requirements:
  - It shall be the financial responsibility of the applicant.
  - It shall be prepared by a qualified person experienced in the fields of environmental noise assessment and architectural acoustics.
  - It shall include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions and the predominant noise sources.
  - It shall include estimates of existing and projected cumulative (20 years) noise levels in terms of Ldn or CNEL and/or the standards of Table 8-1 [Table 3.11-1], and compare those levels to the policies and standards of this section of the General Plan.
  - It shall recommend appropriate mitigation to achieve compliance with the policies and standards of this section of the General Plan, 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. Where the noise source in question consists of intermittent single events, the report must address the effects of maximum noise levels in sleeping rooms in terms of possible sleep disturbance.
  - It shall include estimates of noise exposure after the prescribed mitigation measures have been implemented.
  - It shall describe a post-project assessment program, which could be used to evaluate the effectiveness of the proposed mitigation measures.
- **Policy 8.G.5:** The City shall evaluate the general feasibility of proposed projects with respect to existing and future transportation noise levels shown in Figure 8-1.
- **Policy 8.G.6:** The City shall prohibit new development of noise-sensitive land uses in areas exposed to existing or projected levels of noise from transportation noise sources which exceed the levels set out in Table 8-2 [Table 3.11-2], unless the project design includes effective mitigation measures to reduce exterior noise and noise levels in interior spaces to the levels set out in Table 8-2 [Table 3.11-2]. Exceptions to this standard will be permitted within the Southeast Area Specific Plan Area, where a 5 dB increase in outdoor activity areas will be permitted.
- **Policy 8.G.7:** The noise created by new transportation noise sources shall be mitigated so as not to exceed the levels specified in Table 8-2 [Table 3.11-2] at outdoor activity areas or interior spaces of existing noise sensitive land uses.
- **Policy 8.G.8:** New roadway improvement projects will be needed to accommodate development permitted according to the Land Use Diagram. Where existing noise-sensitive

uses may be exposed to increased noise levels due to increased roadway capacity and increases in travel speeds associated with roadway improvements, the City will apply the following criteria to determine the significance of increases in noise related to roadway improvement projects:

- Where existing traffic noise levels are less than 60 dB Ldn at the outdoor activity areas of noise-sensitive uses, a +5 dB L_{dn} increase in noise levels due to a roadway improvement project will be considered significant; and
- Where existing traffic noise levels range between 60 and 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +3 dB L_{dn} increase in noise levels due to a roadway improvement project will be considered significant; and
- Where existing traffic noise levels are greater than 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a + 1.5 dB L_{dn} increase in noise levels due to a roadway improvement project will be considered significant.

Table 3.11-2: Maximum Allowable Noise Exposure Transportation Noise Sources

Land Use	Outdoor Activity Areas[1] L_{dn}/CNEL, dB	Interior Spaces	
		L_{dn}/CNEL, dB	L_{eq}, dB[2]
Residential	60[3]	45[5]	—
Transient Lodging	60[4]	45	—
Hospitals, Nursing Homes	60[3]	45	—
Theaters, Auditoriums, Music Halls	—	—	35
Churches, Meeting Halls	60[3]	—	40
Office Buildings	—	—	45
Schools, Libraries, Museums	—	—	45
Playgrounds, Neighborhood Parks	70	—	—

1. 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 use.
   Where it is not practical to mitigate exterior noise levels at patio or balconies of apartment complexes, a common area such as a pool or recreation area may be designated as the outdoor activity area.
2. As determined for a typical worst-case hour during periods of use.
3. Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.
4. In the case of hotel/motel facilities or other transient lodging, outdoor activity areas such as pool areas may not be included in the project design. In these cases, only the interior noise level criterion will apply.
5. The intent of this noise standard is to provide increased protection against sleep disturbance for residences located near railroad tracks.

- **Policy 8.H.1:** Where noise-sensitive land uses are proposed in areas exposed to existing or projected exterior noise levels exceeding the levels set out in Table 8-2 [Table 3.11-2] or the performance standards of Table 8-1 [Table 3.11-1], an acoustical analysis shall be required as

part of the environmental review process so that noise mitigation may be included in the project design.

- **Policy 8.H.2:** Where noise mitigation measures are required to achieve the standards of Tables 8-1 [Table 3.11-1] and 8-2 [Table 3.11-2], the emphasis in such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered as a means of achieving the noise standards only after all other practical design-related noise mitigation measures have been integrated into the project.
- **Policy 8.H.3:** The City shall support the County's right-to-farm ordinance, especially as it relates to noise emanating from the agricultural operations adjacent to urban uses.

Chapter 15, Section 15-26 (d) of the City of Woodland Municipal Code states that noise from construction activities is allowed

> between the hours of 7:00 A.M. and 6:00 P.M. on Monday, Tuesday, Wednesday, Thursday, Friday and Saturday, and between 9:00 A.M. and 6:00 P.M. on Sunday, except in case of urgent necessity in the interest of public health and safety, and then only with a permit from the building inspector, which permit may be granted for a period not to exceed three days or less while the emergency continues, and which permit may be renewed for a period of three days or less while the emergency continues. If the building inspector should determine that the public health and safety will not be impaired by the erection, demolition, alteration or repair of any building or the excavation of streets and highways within the hours of 6:00 P.M. and 7:00 A.M. on weekdays and 6:00 P.M. and 9:00 A.M. on Sundays, and if he shall further determine that loss or inconvenience would result to any party in interest, he may grant permission for such work to be done within the hours of 6:00 P.M. and 7:00 A.M. on weekdays and 6:00 P.M. and 9:00 A.M. on Sundays, upon application being made at the time the permit for the work is awarded or during the progress of the work.

Chapter 15, Section 15-26 (e) of the City of Woodland Municipal Code states that the use is prohibited "between the hours of 10:00 P.M. and 7:00 A.M. of any pile driver, steamshovel, pneumatic hammer, derrick, steam and electric hoist or other appliance, the use of which is attended by loud or unusual noise."

3.11.4 - Methodology

The proposed project's noise impacts were evaluated through noise measurements and modeling of potential noise impacts. The analysis is described below.

Measurement Procedure and Criteria

To ascertain the existing noise at and adjacent to both the Grasslands and Beamer/Cottonwood sites, field monitoring was conducted on July 23, 2012. The field survey noted that noise within the area of

the proposed project is generally characterized by vehicle traffic on the local roadways. Tree trimming was occurring during some of the noise measurements.

The noise measurements were taken using an Extech Model 407780 Type 2 integrating sound level meter programmed in "slow" mode to record the sound pressure level at 1-second intervals in "A" weighted form. In addition, the L_{eq} averaged over the entire measuring time, L_{min} and L_{max} were recorded. The sound level meter and microphone was mounted on a tripod 5 feet above the ground and was equipped with a windscreen during all measurements. The sound level meter was calibrated before and after the monitoring using an Extech calibrator, Model 407766. All noise level measurement equipment meets American National Standards Institute specifications for sound level meters (S1.4-1983 identified in Chapter 19.68.020.AA).

Noise Measurement Locations

The noise monitoring locations at each site were selected to obtain noise measurements of the current noise levels in each project study area and to provide a baseline for any potential noise impacts that may be created by development of the proposed project. The noise measurement sites were selected to provide a representative sampling of the noise levels experienced by nearby sensitive receptors. The sites are described in Table 3.11-3 and illustrated in Exhibit 3.11-1a and Exhibit 3.11-1b.

Noise Measurement Timing and Climate

The noise measurements were recorded between 10:57 a.m. and 3:35 p.m. on July 23, 2012. When the noise measurements were started, skies were clear, the temperature was 80 degrees Fahrenheit (°F), and the wind was 2 to 4 miles per hour. Measurements were taken for 15 minutes at each of the project sites.

Table 3.11-3: Existing Noise Level Measurements

Site Location	Description	L_{eq}	L_{MAX}	L_{MIN}
Cottonwood/Beamer				
Site 1	Located East side of project site, next to Yolo County Health Department building, south of the parking lot.	49.9	62.3	41.5
Site 2	Located north side of project site, along W. Woodland Avenue. Area consisted of light vegetation.	55.3	73.3	40.5
Site 3	Located along the west edge of the project site along N. Ashley Avenue	59.0	81.1	37.7
Site 4	Located along the southern edge of the property, 25 feet from the fence, just north of the Yolo County Planning and Public Department.	44.3	51.5	40.1
Grasslands				
Site 1	Located along western side of County Road 104, catty-corner of project site. Area consisted of small gravel and dirt, little to no vegetation.	68.1	88.5	38

Table 3.11-3 (cont.): Existing Noise Level Measurements

Site Location	Description	L_{eq}	L_{MAX}	L_{MIN}
Site 2	Located along western side of County Road 104, across the street from project site, located outside of residence.	68.2	92.9	43.1

Analysis of Construction Equipment

Modeling for construction-related noise was performed using the U.S. Department of Transportation Federal Highway Administration's (FHWA) Roadway Construction Noise Model (RCNM). The RCNM is the FHWA national model used for the prediction of construction-related noise and to determine compliance with noise limits for a variety of types of construction projects of varying complexity. The RCNM includes an extensive compilation of built-in reference noise levels for dozens of types of construction-related equipment based on manufacturer and actual monitored sources.

3.11.5 - Thresholds of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, noise impacts resulting from the implementation of the proposed project would be considered significant if the project would cause:

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

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

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

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

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? (Refer to Section 7, Effects Found Not To Be Significant.)

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels? (Refer to Section 7, Effects Found Not To Be Significant.)

Source: ESRI Aerial Imagery. MBA Field Survey and GIS Data, 2012.

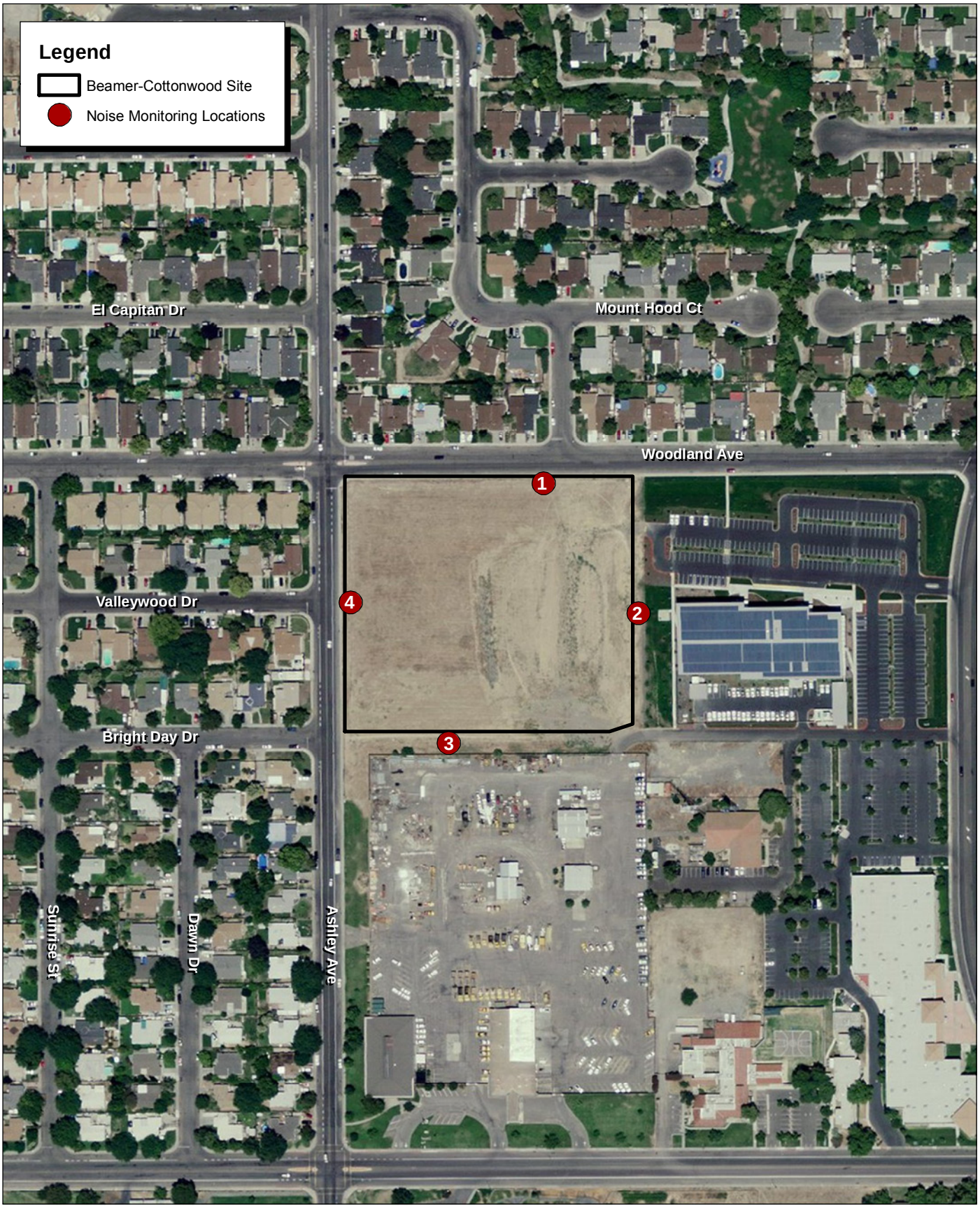
Michael Brandman Associates

NORTH

500 250 0 500

Feet

Exhibit 3.11-1a
Noise Monitoring Locations
Grasslands Site



Source: ESRI Aerial Imagery. MBA Field Survey and GIS Data, 2012.

Exhibit 3.11-1b
Noise Monitoring Locations
Beamer-Cottonwood Site

Michael Brandman Associates

NORTH

250 125 0 250

Feet

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YOLO COUNTY DEPARTMENT OF GENERAL SERVICES
ENVIRONMENTAL EDUCATION AND SUSTAINABILITY PARK PROJECT
DRAFT ENVIRONMENTAL IMPACT REPORT

3.11.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the project and provides mitigation measures where appropriate.

Noise Levels in Excess of Standards

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

Impact Analysis

Construction-Related Noise

Construction noise represents a short-term increase in ambient noise levels. Noise impacts from construction activities associated with the proposed project would be a function of the noise generated by construction equipment, equipment location, and sensitivity of nearby land uses, and the timing and duration of the construction activities. The construction activities for the proposed project are anticipated to include fine site grading of each project site and construction of the solar arrays.

Both project sites are essentially flat. Consequently, minimal grading would be required to level the areas where buildings and solar arrays would be located. Some light grubbing and minimal grading is expected to be required for targeted leveling and trenching, and fine grading would be required for the development of internal gravel driveways. No fill material would be imported or exported.

Minor grading would include the use of various equipment including graders, bulldozers, compactors, and water trucks to control dust.

To construct the solar array, support piles up to 18 feet long would be installed by vibratory pile driving (eliminating the need for individual concrete footings)—which would involve inserting a steel pile into the ground using a hydraulic vibratory pile drive—or by drilling and cast-in-place methods, depending on subsurface conditions. The piles would be approximately 5 inches in diameter by 18 feet in length. The piles would be installed with approximately 5 feet remaining above grade, which would serve as the foundation for the tracker arrays. No blasting or rock breaking would occur during project construction. To be conservative, the vibratory pile driving method was evaluated in this analysis, because it generates more noise and vibration than the drilling and casting method.

Construction noise levels will vary significantly, based upon the size and topographical features of the active construction zone, duration of the workday, and types of equipment employed, as indicated in Table 3.11-4.

Table 3.11-4: Construction Equipment Noise Emissions and Usage Factors

Equipment	Acoustical Use Factor (percent)	Actual Measured L_{max} @ 50 feet (dBA, slow)
Auger Drill Rig	20	84
Backhoe	40	78
Bar Bender	20	N/A
Compactor (ground)	20	83
Compressor (air)	40	78
Concrete Batch	15	N/A
Concrete Mixer Truck	40	79
Concrete Pump	20	81
Concrete Saw	20	90
Crane	16	81
Dozer	40	82
Dump Truck	40	76
Excavator	40	81
Flat Bed Truck	40	74
Front End Loader	40	79
Generator	50	81
Grader/Scraper	40	84
Jackhammer	20	89
Paver	50	77
Pneumatic Tools	50	85
Pumps	50	81
Roller	20	80
Vibratory Pile Driver	20	101
Source: FHWA RCNM User's Guide Table 1.		

Grasslands Site

The construction activities for the proposed Grasslands site are anticipated to include fine grading of the project site and the installation of the solar array, environmental education center, park host site, wildlife viewing areas, picnic areas, and trails. The closest noise-sensitive receptor is the residence located on the western side of County Road 105/Mace Boulevard adjacent to the southwestern portion of the site. Potential conservation areas are proposed for the southern and eastern portions of the project site, which would only be developed with walking trails. As such, the southern portion of the site will undergo very little grading. The majority of construction equipment will be utilized for

preparing the footing for the solar array, at an average distance of 850 feet from the residential boundary. Table 3.11-5 shows the noise levels anticipated at the nearby residence during fine grading.

Table 3.11-5: Unmitigated Grading Equipment Noise Levels - Grasslands

Equipment Description	Noise Levels at Average Distance of 850 Feet (dBA)	
	L_{max}	L_{eq} [a]
Grader	60.4	56.4
Dozer	57.1	53.1
Compactor (ground)	58.6	51.6
Flat Bed Truck	49.6	45.7

Note:
[a] Reflects the noise level over the percentage of time the equipment is in use. Sources: Equipment list and FHWA Road Construction Noise Model.

After grading, the solar array will be installed. As the solar array will be located toward the northern portion of the site, the closest panel would be approximately 362 feet from the residential boundary; however, the average distance of the panels from the residential use to the southwest is 850 feet. Table 3.11-6 shows the noise levels (at both distances) anticipated during this phase of construction, which would last approximately 35 working days.

Table 3.11-6: Unmitigated Installation Equipment Noise Levels - Grasslands

Equipment Description	Noise Levels ~362 Feet from Source (dBA)		Noise Levels ~850 Feet from Source (dBA)	
	L_{max}	L_{eq} [a]	L_{max}	L_{eq} [a]
Vibratory Pile Driver	83.6	76.6	76.2	69.2
Backhoe	60.4	56.4	53.0	49.0
Crane	63.4	55.4	55.9	48.0

Notes:
[a] Reflects the noise level over the percentage of time the equipment is in use.
Sources: Equipment list and FHWA Road Construction Noise Model

Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full-power operation followed by 3 to 4 minutes at lower power settings. Therefore, noise levels fluctuate during construction activities. Although there would be a relatively high, single-event noise exposure potential, resulting in potential short-term intermittent annoyances, the effect in long-term ambient noise levels would be small when averaged over a longer period of time (24 hours for CNEL). As shown by the ambient noise level measurements in Table 3.11-3, the maximum noise levels in the project vicinity can be as high as 92.9 dBA (L_{max}). The results shown in Table 3.11-5 and Table 3.11-6 show that construction equipment would generate maximum noise levels of 83.6

dBA (L_{max}) at 362 feet. Noise generated from construction equipment would be transitory, intermittent, and not a source of continuous noise.

However, as the construction noise from use of the vibratory pile driver during the installation of the solar array will likely exceed the 60-dBA CNEL standard at the residential boundary, mitigation measures NOI-1a through NOI-1e are required to reduce impacts to a less than significant level.

Beamer/Cottonwood Site

The construction activities for the proposed Beamer/Cottonwood site are anticipated to include fine grading of the project site and the installation of the solar array. The closest noise-sensitive receptors are the residential uses located to the north and west of the project site. Grading activities will occur at an average distance of 236 feet from the adjacent receptors. Table 3.11-7 below shows the noise levels anticipated at the closest noise-sensitive receptors during fine grading.

Table 3.11-7: Unmitigated Grading Equipment Noise Levels – Beamer/Cottonwood

Equipment Description	Noise Levels at Average Distance of 850 Feet (dBA)	
	L_{max}	L_{eq}[a]
Grader	71.5	67.5
Dozer	68.2	64.2
Compactor (ground)	69.8	62.8
Flat Bed Truck	60.8	56.8

Note:
[a] Reflects the noise level over the percentage of time the equipment is in use. Sources: Equipment list and FHWA Road Construction Noise Model

After grading, the solar array will be installed. The solar array will be located toward the eastern portion of the site; the closest panel would be approximately 130 feet from the residential boundary of the homes to the north of the site, north of Beamer Street. The average distance of the panels from the residential uses to the north and the closest panel to the homes to the west (west of Ashley Avenue) is approximately 347 feet. Table 3.11-8 shows the noise levels (at both distances) anticipated during this phase of construction, which would last approximately 3 working days.

Table 3.11-8: Unmitigated Installation Equipment Noise Levels – Beamer/Cottonwood

Equipment Description	Noise Levels ~130 Feet from Source (dBA)		Noise Levels ~347 Feet from Source (dBA)	
	L_{max}	L_{eq}[a]	L_{max}	L_{eq}[a]
Vibratory Pile Driver	92.5	85.5	84.0	77.0
Backhoe	69.3	65.3	60.7	56.8

Table 3.11-8 (cont.): Unmitigated Installation Equipment Noise Levels – Beamer/Cottonwood

Equipment Description	Noise Levels ~130 Feet from Source (dBA)		Noise Levels ~347 Feet from Source (dBA)	
	L_{max}	L_{eq}[a]	L_{max}	L_{eq}[a]
Crane	72.3	64.3	63.7	55.8

Notes:
[a] Reflects the noise level over the percentage of time the equipment is in use.
Sources: Equipment list and FHWA Road Construction Noise Model

Table 3.11-7 and Table 3.11-8 show that construction equipment would generate maximum noise levels of 92.5 dBA (L_{max}) at 130 feet. As shown by the ambient noise level measurements in Table 3.11-3, the maximum noise levels in the project vicinity can be as high as 81.1 dBA (L_{max}). Noise generated from construction equipment would be transitory, intermittent, and not a source of continuous noise.

Similar to the impacts at the Grasslands site, the noise impacts at the Beamer/Cottonwood location are likely to exceed the City of Woodland 60 dBA CNEL residential noise standard. Although noise related to construction activities is permitted "between the hours of 7:00 A.M. and 6:00 P.M. on Monday, Tuesday, Wednesday, Thursday, Friday and Saturday, and between 9:00 A.M. and 6:00 P.M. on Sunday," to reduce construction-related noise impacts, incorporation of Mitigation Measures MM NOI-1b through MM NOI-1f are required.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Grasslands Site

MM NOI-1a Active hours of construction at the Grasslands project site, including transporting of construction material, shall be limited to between the hours of 7 a.m. and 7 p.m., Monday through Saturday. No construction shall occur on Sundays or holidays.

MM NOI-1b Construction equipment shall be properly maintained in accordance with manufacturers' specifications and shall be fitted with the best available noise suppression devices (e.g., mufflers, silencers, wraps). All impact tools shall be shrouded or shielded, and all intake and exhaust ports on power equipment shall be muffled or shielded.

MM NOI-1c Construction equipment shall not idle for extended periods of time (no more than 5 minutes) near adjacent land uses.

MM NOI-1d Stationary equipment (compressors, generators, and cement mixers) shall be located as far from the residential uses as feasible.

MM NOI-1e During pile installation, the contractor must use a moveable acoustic curtain (made of barrier septum composite (BSC)-13-2" acoustical material that consists of a combination of 2-inch-thick, vinyl-faced, quilted fiberglass sound absorber and reinforced loaded vinyl noise barrier [1 pound per square foot] that are bonded together). The curtain must be of a size and shape that will surround the hammer and steel pile on three sides when properly placed. The curtain is constructed of a steel frame with acoustic material fastened to the steel framework. The moveable curtain must also be long enough to cover the pile driver and steel pile when they are at the highest point at the beginning of a drive. The curtain must be moveable so that it can be relocated as the active pile driving point progresses along the site. It will be hung on the crane's second cable or attached to another crane (such as boom crane) for proper placement.

Beamer/Cottonwood Site

Implement MM NOI-1b through MM NOI-1e and the following:

MM NOI-1f Active hours of construction at the Beamer/Cottonwood project site, including transporting of construction material, shall be limited to between the hours of 7 a.m. and 6 p.m., Monday through Saturday, and 9 a.m. to 6 p.m. on Sunday (unless permitted by the City of Woodland Building Inspector).

Level of Significance After Mitigation

Grasslands Site

Less than significant impact.

When properly placed, the acoustic curtain will provide noise control in the range of 10 to 15 dBA. The results of this reduction are shown in Table 3.11-9 and Table 3.11-10.

Table 3.11-9: Mitigated Installation Equipment Noise Levels – Grasslands Site

Equipment Description	Noise Levels ~362 Feet from Source (dBA)		Noise Levels ~850 Feet from Source (dBA)	
	L_{max}	L_{eq} [a]	L_{max}	L_{eq} [a]
Vibratory Pile Driver	68.6 to 73.6	61.6 to 66.6	61.2 to 66.2	54.2 to 59.2

Note:
[a] Reflects the noise level over the percentage of time the equipment is in use.
Sources: Equipment list and FHWA Road Construction Noise Model.

As stated above, although the single-event noise exposure potential is slightly above 60 dBA L_{eq}, the effect in long-term ambient noise levels would be small when averaged over longer time (24 hours for CNEL), as such, construction-related noise levels would not exceed the 60-dBA CNEL standard and would be similar to the ambient noise levels in the project vicinity. Impacts are considered to be less than significant.

Beamer/Cottonwood Site
Less than significant impact.

The acoustic curtain will provide noise control in the range of 10 to 15 dBA. The results of this reduction are shown below.

Table 3.11-10: Mitigated Installation Equipment Noise Levels – Beamer/Cottonwood Site

Equipment Description	Noise Levels ~ 130 Feet from Source (dBA)		Noise Levels ~ 347 Feet from Source (dBA)	
	L_{max}	L_{eq}[a]	L_{max}	L_{eq}[a]
Vibratory Pile Driver	77.5 to 82.5	70.5 to 75.5	69.0 to 74.0	62.0 to 67.0

Note:
[a] Reflects the noise level over the percentage of time the equipment is in use.
Sources: Equipment list and FHWA Road Construction Noise Model

As stated above, both L_{max} and L_{eq} noise levels are above 60 dBA at the closest distance of 130 feet from the pile installation. It is likely that during the 3 days it would take for installation of the piles, the 60-dBA CNEL (a 24-hour average) residential standard will be exceeded. However, as this project is located within the City of Woodland, noise related to construction activities is permitted "between the hours of 7:00 A.M. and 6:00 P.M. on Monday, Tuesday, Wednesday, Thursday, Friday and Saturday, and between 9:00 A.M. and 6:00 P.M. on Sunday." The higher noise levels generated by installation of the piles are temporary and will terminate once the pile are installed. Because of the City's construction exemption from noise standards and the very short duration of this noisy phase of construction, impacts are considered to be less than significant with incorporation of mitigation.

Excessive Groundborne Vibration

Impact NOI-2: **The project would not result in expose persons to or generation of excessive groundborne vibration or groundborne noise levels.**

Impact Analysis

This impact discussion analyzes the potential for the proposed project to cause an exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. Vibration levels in the project area would be influenced by construction activities and from the ongoing operations of the proposed project.

A vibration impact would be generally considered significant if it involves any construction-related or operations-related impacts in excess of 0.05-inch-per-second RMS vertical velocity at the nearby sensitive receptors (0.035 inch per second is barely perceptible). The construction and operations-related vibration impacts have been analyzed separately below.

Construction activity can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of construction equipment causes ground vibrations that spread through

the ground and diminish in strength with distance. Buildings in the vicinity of the construction site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. Table 3.11-11 gives approximate vibration levels for particular construction activities and provides a reasonable estimate for a wide range of soil conditions.

Table 3.11-11: Vibration Source Levels for Construction Equipment

Equipment	Peak Particle Velocity (inches/second) at 25 Feet	Approximate Vibration Level (L_V) at 25 Feet
Pile driver (impact)	1.518 (upper range) 0.644 (typical)	112 104
Pile driver (sonic)	0.734 upper range 0.170 typical	105 93
Clam shovel drop (slurry wall)	0.202	94
Hydromill (slurry wall)	0.008 in soil 0.017 in rock	66 75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58
Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006.		

Construction activities can produce vibration that may be felt by adjacent uses. The construction of the proposed project would require the use of equipment such as pile drivers, which are known to generate substantial construction vibration levels. From Table 3.11-11 above, a vibratory (sonic) pile driver would produce the largest amount of equipment-related vibration on the project site: 0.170 inch per second PPV at 25 feet with an approximate vibration level of 93.

Grasslands Site

The distance between the receptor to southwest of the site and the closest pile installation is approximately 362 feet. The vibration levels caused by the vibratory pile driver at this distance will be approximately 0.0031 inch per second, which would not exceed the 0.05 inch per second significance threshold, and the impact is considered to be less than significant.

Beamer/Cottonwood Site

The distance between the closest receptor to the north site and the closest pile installation is approximately 130 feet. The vibration levels caused by the vibratory pile driver at this distance will

be approximately 0.0143 inch per second, which would not exceed the 0.05 inch per second significance threshold, and the impact is considered to be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

Grasslands Site

No mitigation is necessary.

Beamer/Cottonwood Site

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Permanent Increase in Ambient Noise Levels

Impact NOI-3:	**The project would not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.**

Impact Analysis

Grasslands Site

In general, operations of the proposed project would not contribute towards a substantial permanent increase in ambient noise levels in the surrounding area. The Grasslands site would consist of a 5-megawatt (MW) solar panel array and an environmental education center. The solar panel array would comprise solar PV panels made of crystalline silicon with anti-reflective glass. The solar panel array would generate electricity directly from sunlight, collect it to a single point at the project substation, and interconnect it to the high-voltage transmission system for delivery to the utility buyer's customers. The solar panel array configuration would use approximately 21 acres of the 41-acre project site. The environmental education center would consist of a modular building, a park host site, walking trails, wildlife viewing area and picnic areas.

The environmental education center would host field trips from Yolo County elementary schools (K-12) and would be operated by the Yolo County Office of Education. It would be operated during normal Grasslands Regional Park hours of dawn to dusk. The center would provide educational information regarding the solar array, energy conservation, sustainability, and habitat protection. In connection with the environmental education center, the Grasslands solar array would be used as an experimental laboratory for the feasibility of crop production beneath solar panels. To assess the potential for onsite noise generated by the education center activities, a reference noise level for elementary school yard noise was used. At a distance of 100 feet from an elementary school playground being used by 100 students, average and maximum noise levels of 60 and 75 dBA, respectively, can be expected (Ambient 2010). The closest sensitive receptor is at least 400 feet from the proposed educational building; therefore, noise levels generated by children at this distance would

average approximately 48 dBA, with an approximate maximum of 63 dBA. As the area is already exposed to average noise levels of approximately 68 dBA L_{eq} and maximum noise levels up to 92.9 dBA, the operational activities of the education center and its attendees will not result in a substantial permanent increase in ambient noise.

Because of the proposed project's reliance on the sun, the project would operate only during daytime hours when the solar panels are generating power and background ambient noise is typically greater. The proposed project would not operate during nighttime hours.

Operation of the proposed project would result in the hiring of a SunPower Operations and Maintenance Service team. However, the majority of operations and maintenance work can be completed remotely, and, as such, vehicular traffic will not increase as a result of the operation of either solar facility. Panel-washing crews would conduct panel washing two times per year.

Sheep will be used for control of native grasses. Sheep are small enough to graze within the solar array with a minimal amount of risk of damage to project infrastructure and have been successfully used in solar farms for years. Sheep effectively utilize rapid-growing annual grasses. All classes of sheep (ewes, lambs, and rams) can be used. The grazing of sheep would reduce vegetation heights on the project site in order to reduce the potential risk of grass fire. Sheep are the preferred species for grazing because they are capable of closely cropping grasses and other forage plants. Sheep are not a source of significant noise and would be a use consistent with adjoining agricultural lands. Furthermore, the Grasslands site has been grazed by cattle in the past.

Therefore, impacts associated with a substantial permanent increase in ambient noise levels would be less than significant.

Beamer/Cottonwood Site

The Beamer/Cottonwood site would have similar operational noise levels as the Grasslands site. However, no education center is proposed at this site; therefore, there will be no school-children-related noise impacts.

Therefore, impacts associated with a substantial permanent increase in ambient noise levels at the Beamer/Cottonwood site would also be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

Grasslands Site

No mitigation is necessary.

Beamer/Cottonwood Site

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Temporary or Periodic Increase in Ambient Noise Levels

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

Impact Analysis

Grasslands Site

As discussed under Impact NOI-1, the unmitigated construction of the solar array would expose receptors to excessive noise levels, primarily from pile driving activities. Table 3.11-6, shows that at the closest point of activity (approximately 362 feet from the residential boundary to the southwest), the pile driver could generate up to 83.6 dBA L_{max} and 76.6 dBA L_{eq}. As shown in Table 3.11-3, the existing noise levels within the project vicinity are up to 92.9 dBA L_{max}; however, the average existing noise level is 68.2 dBA L_{eq}, which means the average pile driver noise is 8.4 dBA greater than existing average noise levels. With incorporation of Mitigation Measures NOI-1a through NOI-1e, noise levels will be reduced to less than significant levels.

Beamer/Cottonwood Site

As shown in Impact NOI-1, the unmitigated construction of the solar array would expose receptors to excessive noise levels, primarily from pile driving activities. Table 3.11-8, shows that at the closest point of activity (approximately 130 feet from the residential boundary to the north), the pile driver could generate up to 92.5 dBA L_{max} and 85.5 dBA L_{eq}. As shown in Table 3.11-3, the existing noise levels within the project vicinity are up to 81.1 dBA L_{max} and 59.0 dBA L_{eq}, which shows that the average pile driver noise is 26.5 dBA greater than existing average noise levels. With incorporation of Mitigation Measures NOI-1b through MM NOI-4, noise levels will be reduced. Although noise levels will be higher than ambient levels, the duration of pile driving will be limited to 3 days for a maximum of eight hours per day. As required by MM NOI-4, properties within 500 feet of the project boundary will be notified in advance of pile driving activities and will be given information regarding a noise complaint hotline. After pile driving activities cease, construction activities will generate noise levels similar to those already experienced by receptors within the project vicinity. Furthermore, the duration of the pile driving would be limited to and occur within the times allowed by the City of Woodland Municipal Code regarding construction activities, which generally occur during typical work hours when residents in nearby affected residences would likely be at work or school. As such, impacts would be temporary and less than significant.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Grasslands Site

Implement Mitigation Measures NOI-1a through -NOI-1e.

Beamer/Cottonwood Site

Implement Mitigation Measures NOI-1b through MM-NOI-1f and,

MM NOI-4 Pile driving activities at the Beamer/Cottonwood Site shall be limited to three days, for a maximum of eight hours per day. Properties within 500 feet of the project boundary shall be notified by mail at least 1 week prior to pile driving activities, and provided with the name and telephone number of an onsite contact person in the event of noise complaints. In addition, notices regarding the pile-driving activities and contact information shall be posted at the project site in publicly visible and accessible locations 1 week prior to commencement of pile driving activities.

Level of Significance After Mitigation

Grasslands Site

Less than significant impact.

After mitigation, the noise levels from pile driving at the Grasslands site would be reduced from 68.6 to 73.6 dBA Lmax and 61.6 to 66.6 dBA Leq at the distance of 362 feet, which is less than the existing conditions of 92.9 dBA Lmax and 68.2 dBA Leq. With mitigation, temporary construction activities would not create a substantial increase in noise levels from existing noise levels and are considered to be less than significant.

Beamer/Cottonwood Site

Less than significant impact.

After mitigation, the noise levels from pile driving at the Beamer/Cottonwood site would be reduced from 77.5 to 82.5 dBA L_{max} and 70.5 to 75.5 dBA L_{eq} at the distance of 130 feet, which is similar to the existing conditions of 81.1 dBA L_{max}, but 11.5 to16.5 dBA higher than the existing 59.0 dBA L_{eq}. However, duration of pile driving activities at the Beamer/Cottonwood site would be limited to 3 days for a maximum of 8 hours a day within the hours allowable by the City of Woodland Municipal Code. The allowable hours occur when potentially affected nearby residents are likely to be at work or school. Furthermore, notification to surrounding neighbors of pile driving activities (which includes information for a hotline for noise complaints) will occur. As such, the impacts are considered temporary and less than significant.