4.10 NOISE

1. INTRODUCTION

This section assesses the effects of the proposed CCAP Update on noise and vibration. Government agencies and the public were provided an opportunity to comment in response to a Notice of Preparation (NOP) and Initial Study that provided a preliminary summary of potential impacts that could result from implementation of the proposed CCAP Update. No comments related to noise and vibration were received.

The following section includes general information about noise, including how it is measured, describes the existing noise environment in the lower Cache Creek area, describes potential noise-sensitive receptors, and summarizes the regulatory framework related to noise generation. Finally, this section examines specific noise and vibration impacts related to implementation of the CCAP Update.

2. SETTING

a. General Information on Noise

Noise is commonly defined as unwanted sound that annoys or disturbs people and can have an adverse psychological or physiological effect on human health. Sound is measured in decibels (dB), which is a logarithmic scale. Decibels describe the purely physical intensity of sound based on changes in air pressure, but they cannot accurately describe sound as perceived by the human ear since the human ear is only capable of hearing sound within a limited frequency range. Therefore, the frequency of a sound must be taken into account when evaluating the potential human response to sound. For this reason, a frequency-dependent weighting system is used and monitoring results are reported in A-weighted decibels (dBA). Decibels and other technical terms are defined in Table 4.10-1. Typical A-weighted noise levels at specific distances are shown for different noise sources in Table 4.10-2.

In an unconfined space, such as outdoors, noise attenuates with distance. Noise levels at a known distance from point sources are reduced by 6 dBA for every doubling of that distance for hard surfaces, such as cement or asphalt surfaces, and 7.5 dBA for every doubling of distance for soft surfaces, such as undeveloped or vegetative surfaces.[1] Noise levels at a known distance from line sources (e.g. roads, highways, and railroads) are reduced by 3 dBA for every doubling of the distance for hard surfaces and 4.5 dBA for every doubling of distance for soft surfaces.[2] Greater decreases in noise levels can result from the presence of intervening structures or buffers.

[1] California Department of Transportation (CalTrans), 1998. Technical Noise Supplement: A Technical Supplement to the Traffic Noise Analysis Protocol.

[2] Ibid.

Table 4.10-1: Definition of Acoustical Terms

Term	Definition
Decibel (dB)	A unit describing the amplitude of sound on a logarithmic scale. Sound described in decibels is usually referred to as sound or noise "level." This unit is not used in this analysis because it includes frequencies that the human ear cannot detect.
Frequency (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level (dBA)	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound, in a manner similar to the frequency response of the human ear, and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
Equivalent Noise Level (L_{eq})	The average A-weighted noise level during the measurement period. For this CEQA evaluation, L_{eq} refers to a 1-hour period unless otherwise stated.
Community Noise Equivalent Level (CNEL)	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels to sound levels during the evening from 7 to 10 p.m. and after addition of 10 decibels to sound levels during the night between 10 p.m. and 7 a.m.
Day/Night Noise Level (L_{dn})	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to sound levels during the night between 10 p.m. and 7 a.m.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Peak Particle Velocity (PPV)	The maximum instantaneous peak of a vibration signal.
Root Mean Square (RMS) Velocity	The average of the squared amplitude of a vibration signal.

Sources: Charles M. Salter Associates Inc., 1998. *Acoustics – Architecture, Engineering, the Environment*, William Stout Publishers.Federal Transit Administration, 2006. Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06).

A typical method for determining a person's subjective reaction to a new noise is by comparing it to existing conditions. The following describes the general effects of noise on people:[3]

- A change of 1-dBA cannot typically be perceived except in carefully controlled laboratory experiments;
- A 3-dBA change is considered a just-perceivable difference;
- A minimum of 5-dBA change is required before any noticeable change in community response is expected; and
- A 10-dBA change is subjectively perceived as approximately a doubling or halving in loudness.

[3] Charles M. Salter Associates Inc., 1998. Acoustics – Architecture, Engineering, the Environment, William Stout Publishers.

Table 4.10-2: Typical Sound Levels Measured in the Environment and Industry

Noise Source (Distance in Feet)	A-Weighted Sound Level in Decibels (dBA)
Jet aircraft (200)	112
Subway Train (30)	100
Truck/Bus (50)	85
Vacuum Cleaner (10)	70
Automobile (50)	65
Normal Conversation (3)	65
Whisper (3)	42

Source: Charles M. Salter Associates Inc., 1998. Acoustics – Architecture, Engineering, the Environment, William Stout Publishers.

Because sound pressure levels are based on a logarithmic scale, they cannot be added or subtracted in the usual arithmetical way. For instance, if one noise source emits a sound level of 90 dBA, and a second source is placed beside the first and also emits a sound level of 90 dBA, the combined sound level is 93 dBA, not 180 dBA. When the difference between two noise levels is 10 dBA or more, the amount to be added to the higher noise level is zero. In such cases, no adjustment factor is needed because adding in the contribution of the lower noise source makes no perceptible difference in what people can hear or measure. For example, if one noise source generates a noise level of 95 dBA and another noise source is added that generates a noise level of 80 dBA, the higher noise source dominates and the combined noise level will be 95 dBA.

b. General Information on Vibration

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Several different methods are used to quantify vibration. Typically, groundborne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors to vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment. As defined in Table 4.10-1, vibration amplitudes are usually expressed as either peak particle velocity (PPV) or the root mean square (RMS) velocity. The PPV is appropriate for evaluating potential damage to buildings, but it is not suitable for evaluating human response to vibration because it takes the human body time to respond to vibration signals. The response of the human body to vibration is dependent on the average amplitude of a vibration. The RMS of a signal is the average of the squared amplitude of the signal and is more appropriate for evaluating human response to vibration. The PPV and RMS are normally described in units of inches per second (in/sec), and RMS is also often described in vibration decibels (VdB).

c. Physical Environment

(1) Existing Noise Environment

The major noise sources in the study area are associated with transportation (i.e., vehicles traveling on the local and regional roadway network). Other noise sources include agricultural, mining, processing, and aircraft activity.

Traffic Noise. The Project area is served by regional freeways and highways in the state system. Regional north-south access is provided by Interstate 5 (I-5) and Interstate 505 (I-505). State Route 16 (SR 16) also traverses the Project area, running in a generally east-west direction. Existing highway traffic noise levels are derived from the Health and Safety Element of the Yolo County General Plan and summarized below:

I-5. I-5 travels through eastern Yolo County. Noise levels along I-5 at 100 feet from the road centerline range from 65 to 70 dBA Ldn, with the highest noise levels along roadway segments closest to the Sacramento County line.

I-505. Noise levels at 100 feet from the roadway centerline range between 61 and 64 dBA Ldn. The segment near Winters experiences the highest volumes of traffic and levels of roadway noise.

SR 16. SR 16 provides the major connection from I-5 through Woodland, and northwest through the Capay Valley. Noise levels at 100 feet from the roadway centerline range from 63 to 65 dBA Ldn. The highest noise levels along the roadway are generally found on segments west of I-505.

Agriculture. The majority of the land in the CCAP area is used for agriculture. Noise sources associated with agricultural activities include field and crop maintenance, hauling, and crop dusting from small aircraft. The noise from these sources mostly occurs within the confines of the agricultural fields, and is seasonal. A characteristic of agricultural noise is short periods of noisy activities separated by long periods of little or no noise-producing activities. As indicated in the Yolo County General Plan EIR, food processing, winery, olive oil processing are also a source of noise in the study area. Mechanical equipment and trucking are primary sources of noise associated with these facilities.

Mining Operations and Hauling. This activity consists of extracting sand and gravel aggregate material and transporting it to approved processing plants located along lower Cache Creek. Noise-generating equipment used in mining include bulldozers, loaders, scrapers, drag lines, and dredges. Aggregate material is generally transported to a processing plant by conveyors, but on-site haul trucks or scrapers are also used. The processing of aggregate material is typically done at a stationary processing plant within the boundaries of the mining site. Noise-producing activities include crushing, sorting and loading of aggregate materials. Noise generated during processing is considered fixed-source noise. Aggregate materials, once processed, are hauled from the processing plant to construction sites within and outside of Yolo County. Noise is generated on access roads, designated haul routes (County roads) and on SR 16 and I-505, as haul trucks travel to and from the plant sites. The noise from these linear sources includes noise emanating from all other vehicles using the roadways.

Aircraft Activities. The Watts-Woodland Airport is the nearest public airport, a portion of which is located within the southeastern portion of the CCAP area. The CNEL 60 contours (year 2003) for the airport are primarily within airport property.[4]

(2) Noise-Sensitive Receptors

As defined in the Yolo County 2030 Countywide General Plan, noise-sensitive receptors include residentially designated land uses, hospitals, nursing/convalescent homes, and similar board and care facilities, hotels and lodging, schools and day care centers, and neighborhood parks. Residences are located within and adjacent to the CCAP area. Most other noise-sensitive receptors are located outside the CCAP area. The primary medical facility is the Woodland

[4] Yolo County, 2009, 2030 Countywide General Plan, November.

Memorial Hospital (located in the City of Woodland). Schools and day care centers are located in the City of Woodland and the communities of Esparto, Madison and Capay. These include Esparto High School on SR 16 and the Madison Migrant Children's Center on SR 16 near Road 89.

d. Regulatory Environment

(1) State

California Noise Control Act. Sections 46000 to 46080 of the California Health and Safety Code codify the California Noise Control Act (CNCA) of 1973. This act established the Office of Noise Control under the California Department of Health Services. The CNCA requires that the Office of Noise Control adopt, in coordination with the Office of Planning and Research, guidelines for the preparation and content of noise elements for general plans. The most recent guidelines are contained in General Plan Guidelines, published by the California Office of Planning and Research in 2017. The document provides land use compatibility guidelines for cities and counties to use in their general plans in order to reduce conflicts between land use and noise.

(2) Local

2030 Countywide General Plan. The 2030 Countywide General Plan[5] contains the following goals, policies, and actions related to noise that are relevant to the proposed Project:

Goal HS-7: Noise Compatibility. Protect people from the harmful effects of excessive noise.

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-7.8: 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.

Action HS-A62: Regulate the location and operation of land uses to avoid or mitigate harmful or nuisance levels of noise to the following sensitive receptors: residential uses, hospitals and nursing/convalescent homes, hotels and lodging, and appropriate habitat areas.

Action HS-A64: Require the preparation of a noise analysis/acoustical study, including recommendations for attenuation, for all proposed projects which may result in potentially significant noise impacts to nearby sensitive land uses.

The 2030 Countywide General Plan does not have quantitative standards for maximum allowable noise or vibration levels. Yolo County has adopted the State's land use compatibility guidelines, in which noise levels from 50 to 60 Ldn or CNEL are considered normally acceptable for low density single family, duplex, and mobile homes, and noise levels from 50 to 75 Ldn or CNEL are considered normally acceptable for agricultural land uses.

CCAP Plans and Regulations The existing plan policies and ordinances related to noise and vibration are presented below. The CCAP Update proposed minor changes to some of these plans ordinances (which are not shown here). Refer to Table 4.10-3, located at the end of this section, for the proposed relevant CCAP Update changes to these policies and ordinances.

[5] Yolo County, 2009, 2030 Countywide General Plan, November.

In-Channel Ordinance

Section 10-3.406. Excavation Limitations. (changed to 10-3.409 under CCAP Update)

(a) Where gravel bars are to be excavated, aggregate removal shall be limited to the downstream portion of the deposit and may not exceed seventy-five (75) percent of the length of the bar. At least twenty-five (25) percent of the upstream portion of the gravel bar shall be retained, in order to allow for the establishment of riparian vegetation. Complete removal of gravel bars may be recommended by the TAC and approved by the Director only if hydraulic conditions related to the bar are recognized to threaten structures and property.

(b) Aggregate material to be removed from the stream bed or stream bank under approved in-channel projects shall be excavated as soon as is practicable after deposition, prior to the establishment of vegetation. No stockpiles shall be left within the channel after excavation has been completed.

(c) The amount of aggregate removed from the channel shall be limited to the amount of sand and gravel deposited during the previous year as estimated by the TAC based on channel morphology data (approximately 200,000 tons annually on average), except where bank excavation is necessary to widen the channel as a part of implementing the Test 3 Run Boundary, or where potential erosion and flooding problems exist. The amount and location of in-channel aggregate removal shall be carried out according to the ongoing recommendations of the TAC and any related County approvals, with the voluntary cooperation of the landowners.

(d) Aggregate material removed pursuant to this ordinance may be sold (CCRMP, Section 6. 1, para. 5). This material is excluded from the tonnage allocation assigned to each off-channel operator pursuant to an approved FHDP (CCRMP, Section 6.1, para. 7).

(e) The volume of aggregate material removed pursuant to this ordinance shall be reported to the County on an annual and total-per-permit basis.

Section 10-3.409. Hours of Operation.

All in-channel operations shall be limited to the hours of 8:00 a.m. to 5:00 p.m., Monday through Friday, unless emergency conditions require otherwise as determined by the Director.

Section 10-3.411. Noise.

Noise levels shall not exceed an average noise level equivalent (Leq) of eighty (80) decibel (dBA) measured at the outermost boundaries of the parcel being excavated. However, noise levels may not exceed an average noise level equivalent (Leq) of sixty (60) decibels (dBA) at any nearby residences or other noise-sensitive land uses, unless emergency conditions require otherwise as determined by the Director.

Mining Ordinance

Section 10-4.421. Noise: General standard.

From 6:00 a.m. to 6:00 p.m., noise levels shall not exceed an average noise level equivalent (Leq) of eighty (80) decibels (dBA) measured at the property boundaries of the site. However, noise levels shall not exceed an

average noise level equivalent (Leq) of sixty (60) decibels (dBA) for any nearby off-site residences or other noise-sensitive land uses.

From 6:00 p.m. to 6:00 a.m., noise levels shall not exceed an average noise level equivalent (Leq) of sixty-five (65) decibels (dBA) measured at the property boundaries of the site.

At no time shall noise levels exceed a community noise equivalent (CNEL) of sixty (60) decibels (dBA) for any existing residence or other noise-sensitive land use. An existing residence shall be considered the property line of any residentially zoned area or, in the case of agricultural land, any occupied offsite residential structures. Achieving the noise standards may involve setbacks, the use of quieter equipment adjacent to residences, the construction of landscaped berms between mining activities and residences, or other appropriate measures.

Section 10-4.422. Noise: Sonic safety devices.

If mining occurs within fifteen-hundred (1500) feet of residences, equipment used during nighttime activities shall be equipped with nonsonic warning devices consistent with the California Office of Safety Hazard Administration (Cal OSHA) regulations, which may include fencing of the area to avoid pedestrian traffic, adequate lighting of the area, and placing an observer in clear view of the equipment operator to direct backing operations. Prior to commencement of operations without sonic warning devices, operators shall file a variance request with the California OSHA Standards Board showing that the proposed operation would provide equivalent safety to adopted safety procedures, including sonic devices.

Section 10-4.423. Noise: Traffic.

Operators shall provide acoustical analysis for future truck and traffic noise associated with the individual operations along County roadways identified as experiencing significant impacts due to increased traffic noise. The study shall identify noise levels at adjacent noise-sensitive receptors and ways to control the noise to the “normally acceptable” goal of a CNEL of sixty (60) dB and reduce the increase over existing conditions to 5 dB or less. Typical measures that can be employed include the construction of noise barriers (wood or masonry), earthen berms, or re-routing of truck traffic

3. IMPACTS AND MITIGATION MEASURES

a. Significance Criteria

The following significance criteria for noise and vibration are based on the changes to CEQA, including Appendix G, that were adopted by the California Natural Resources Agency on December 28, 2018. [6] As part of the adopted revisions two previously used criteria related to permanent and temporary ambient noise levels were combined with the criteria related generally to acceptable local noise levels. Relevant discussion from the Initial Study regarding these criteria is provided below.

[6] http://resources.ca.gov/ceqa/ accessed January 9, 2019.

The proposed Project would result in a significant noise impact if it would:

a) Generate 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.

b) Generate excessive groundborne vibration or groundborne noise levels.

c) 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.

For the purpose of this analysis, a substantial temporary or permanent increase would occur if the activities resulting from implementation of the proposed CCAP Update would generate noise in excess of the standards in the In-Channel Ordinance or the Mining Ordinance as described in Section 2.d. The Yolo County General Plan and County Code do not contain quantitative thresholds for maximum allowable groundborne vibration. For the purpose of this analysis, vibration impacts would be considered potentially significant if they exceed the Federal Transit Administration's (FTA's) recommended vibration thresholds to prevent disturbance to residential receptors from "Infrequent Events" of 80 VdB.

b. Impacts Found Less than Significant in Initial Study

The Initial Study included a preliminary evaluation of the potential impacts of the proposed Project that would occur during project implementation using the previously adopted Appendix G noise and vibration checklist questions as significance criteria. In the Initial Study, the conclusion was reached that implementation of the proposed CCAP Update would not result in significant impact for several of the significance criteria. These are summarized below.

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.

Mining activities are one of the few land uses subject to noise control in the County. The CCAP Update would not substantially change the noise controls that have been applied to both in-channel maintenance activities and/or off-channel commercial mining since the CCAP was adopted in 1996. All in-channel work would continue to be subject to the In-Channel Ordinance, which addresses and limits noise-generating activities.

The CCAP Update would expand the off-channel area designated as SGRO and thus increase the area in which off-channel mining could potentially occur. This could result in new mining operations with the potential to emit noise levels in excess of applicable County standards. However, any new mining location or new processing facility would continue to be subject to the Mining Ordinance which addresses and limits noise-generating activities and each proposed new project would be required to undergo project-specific CEQA review. During the CEQA review process, project-related noise levels would be estimated and impacts on sensitive receptors evaluated and mitigated.

Based on the reasoning presented above, the Initial Study found that the potential for activities under the CCAP Update to expose people to or generate of noise levels in excess of standards established in the local general plan or noise ordinances, or applicable standards of other agencies to be less than significant.

A substantial permanent increase in ambient noise levels in the vicinity of the Project area above levels existing without the project.

The activities that generate noise (e.g., channel reshaping and erosion control projects) conducted under the CCRMP/CCIP would not result in a permanent increase in noise, as all these projects would occur over a relatively short period of time and no noise would be generated from the completed projects. Therefore, the potential for in-channel CCRMP activities to result in a substantial permanent increase is less than significant.

As indicated in Table 4.10-3, located at the end of this section, the CCAP Update would add the SGR overlay to 1,188 acres in the OCMP planning area. Subject to subsequent CEQA analysis, this would allow future mining on specific properties not identified in the original OCMP and not evaluated in the OCMP EIR. In addition, new mining activity could also result in increased truck traffic noise along County roadways. New mining operations would be regulated by the Mining Ordinance (Secs. 10-4.421, 10-4.422, and 10-4.423) as updated and shown in Table 4.10-3, located at the end of this section.

Without project-specific information, it is not possible to calculate noise increases from potential future mining operations. However, because noise levels at defined sensitive receptors would be required to be maintained at or below the "normally acceptable" CNEL of 60 dBA level under existing regulations, the potential impact related to new mining operations potentially causing a new permanent increase in ambient noise levels is less than significant.

Noise related to potential new aggregate mining truck traffic is regulated by Section 10-4.423. This existing regulation would require any proposed new mining operation that would generate new truck traffic to conduct acoustical analysis and specify measures (such as construction of noise barriers (wood or masonry), earthen berms, or re-routing of truck traffic) that would be implemented to ensure compliance with the ordinance and ensure that any increases in noise levels would be below 5 dBA[7] at receptors relative to existing conditions. In addition, any proposed new mining operation or new processing facility would be required to undergo project-specific CEQA review. The project-specific CEQA review will take into consideration of specific site conditions and project details to estimate noise increase in ambient noise levels and evaluate whether the project would be in compliance with the ordinance standards. Therefore, the potential for off-channel OCMP activities to result in a substantial permanent increase in ambient noise levels is less than significant.

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.

The Watts-Woodland Airport is the nearest public airport, a portion of which is located within the southeastern portion of the CCAP area. The CCAP Update would not result in any increase in airport or aircraft noise. This impact is less than significant.

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.

There is no private airstrip in the vicinity of the CCAP area. Therefore, there would be no impact.

[7] The proposed CCAP Update changes this noise unit from dB to dBA (i.e., it adds the A-weighting). This is a minor clarification/correction. The A-weighting de-emphasizes the very low and very high frequency components of the sound, in a manner similar to the frequency response of the human ear, and correlates well with subjective reactions to noise. dBA is generally a better unit to use when evaluating the potential effects of noise on people.

c. Approach

The proposed CCAP Update is comprised of a series of specific text changes to eight policy and regulatory County plans and ordinances that govern the County's activities along Lower Cache Creek. The proposed text changes that have the greatest potential to result in impacts related to noise and vibration are identified in Table 4.10-3, located at the end of this section. This is not the full list of proposed changes, nor necessarily every proposed change that may have noise effects. Each of these proposed changes is discussed in the impact analysis below.

Potential noise effects related to the CCAP Update were evaluated by calculating the noise and vibration that would be generated by equipment that would be used to complete typical in-channel projects on nearby residential receptors. These calculations are based on known noise and vibration characteristics of certain equipment types (i.e., the source) and how noise and vibration attenuate with distance. Project-specific effects from potential new off-channel operations would be further evaluated in subsequent CEQA analysis when more details about the proposed location of the new off-channel operation and potential proximitiy of sensitive receptors are known.

d. Impacts Analysis

Impact NOI-1: The CCAP Update would not result in a substantial temporary or periodic increase in ambient noise levels in the vicinity of the Project area above levels existing without the Project. (LTS)

This criterion from the updated CEQA Guidelines Appendix G states:

> Generate 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.

This criterion is similar to the previous Appendix G criteria considered in the Initial Study prepared for this project (the Initial Study found this impact to be potentially significant and indicated it would be further evaluated in the EIR) which states:

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

The following discussion addresses both of these criteria.

Proposed Revisions to In-Channel Plans and Regulations

As indicated in Table 4.10-3, located at the end of this section, the CCAP Update would allow an increase in the amount of aggregate material that could be removed from the channel during any given year for purposes of periodic channel maintenance and erosion control, and could modify the contours of the channel banks (by implementing the proposed new Channel Form Template). These changes could result in a periodic short-term increase in the intensity of heavy equipment use (and associated noise generated by the equipment) in and near the lower Cache Creek channel and could decrease the distance to off-channel sensitive receptors (if the channel banks are moved outward). In-channel heavy equipment use and removal of material would involve three main noise-generating activities: 1) material excavation from within the creek channel and transport of the material to a nearby processing plant; 2) processing of the material at the plant; and 3) hauling of materials (i.e., aggregate, concrete, or asphalt) by trucks from the plant to customers.

The 1996 CCRMP EIR found that implementation of the CCRMP would remove the (then) current mining activities from the creek channel and introduce other less intensive operations such as erosion control, creek stabilization, and habitat restoration. The equipment used to implement in-channel and typical bank stabilization projects could include excavators, bulldozers, scrapers, and haul trucks.

The In-Channel Ordinance, Section 10-3.411 limits noise levels at nearby receptors to 60 dBA Leq. Table 4.10-4 presents published noise levels at 50 feet from the types of equipment that could be used during in-channel and typical bank stabilization projects. Table 4.10-4 also presents the buffer distance that would be required to reduce noise levels to below the 60 dBA Leq threshold.

Table 4.10-4 Noise levels from In-Channel Activities

Noise Source	L_{eq} at 50 feet (dBA)[a]	Buffer distance to 60 dBA L_{eq} (feet)[b]
Scrapers	67	95
Bulldozer	78	262
Excavator	81	346
Trucks	66	87

Notes:
a Reference noise levels at 50 feet for scrapers were derived from the CCRMP EIR. Reference noise levels at 50 feet expressed in Leq for other equipment were calculated based on the reference noise levels expressed in Lmax from FHWA Highway Construction Noise Handbook (U.S. Department of Transportation, 2006), taking into account the acoustical usage factors also from the Handbook.
b Buffer distances were calculated based on the following propagation adjustment:
dBA2 = dBA1 + 10 Log10(D1/D2)^2.5
Where:
dBA1 is the reference noise level at a specified distance (in this case 50 feet).
dBA2 is the calculated noise level.
D1 is the reference distance (in this case 50 feet).
D2 is the distance from the equipment to the receptor.

Based on review of aerial imagery of the CCAP area, most of the existing sensitive receptors are further than 346 feet[8] away from the existing banks of the Cache Creek channel and the proposed Channel Form Template boundary and would not be exposed to unacceptable noise levels. However, there are several residences in the eastern portion of the CCAP area that are located within 346 feet of the Channel Form Template boundary and therefore could be exposed to higher than acceptable noise levels if in-channel projects were to be located in close proximity to these residences.

Any existing in-channel excavation or restoration activities are subject to (and would continue to be under the CCAP Update) the In-Channel Ordinance. Under existing law, Secs. 10-3.409 (10-3.408 under the CCAP Update) and 10-3.411 restrict the time of day and days of the week that in-channel potential noise-generating activities are allowed to occur and limit noise levels at nearby receptors (to 60 dBA Leq). If projects are proposed within 346 feet of a receptor, and therefore could generate noise that exceeds acceptable noise levels, existing regulations require that measures (e.g., placement of sound barriers) be taken to ensure that acceptable noise levels are maintained at the residences.

[8] As indicated in Table 4.10-4, 346 feet is the buffer distance beyond which no noise impact would occur.

In addition, according to existing regulations (In-Channel Ordinance, Section10-3.401), "In-channel haul roads shall be located along the toe of the streambank". The terrain would provide acoustic shielding of truck movements between the in-channel work area and the processing plant, further reducing noise associated with in-channel activities.

Noise levels generated from processing aggregate material at existing processing plants and distribution of that material with haul trucks on the local road network has already been evaluated under CEQA for each existing mining operation. The processing of raw materials from in-channel sources and distribution of that material would not generate different or increased noise relative to the existing permitted operations.

Based on the discussion and reasoning above, the potential for in-channel excavation and restoration projects to result in a substantial temporary or periodic increase in ambient noise levels in the vicinity of the Project area is less than significant. (LTS)

Proposed Revisions to Off-Channel Plans and Regulations

Increase in Potential Off-Channel Mining Area

As indicated in Table 4.10-3, located at the end of this section, the CCAP Update would result in the designation of 1,188 new acres within the OCMP planning area to SGRO which would allow future mining consistent with the program but on acreage not previously considered in the original OCMP or evaluated in the OCMP EIR. The potential new mining areas would be located within (and constrained to) the "Future Proposed Mining" areas shown on Figure 3-4. Therefore, off-channel OCMP activities (mining and processing) under the CCAP Update could occur in proximity to sensitive receptors that have not been affected by past mining activities. Depending on project location and design these receptors could be exposed to elevated levels of noise.

As shown on Table 4.10-3, located at the end of this section, the proposed CCAP Update would modify Mining Ordinance Section 10-4.422 [Noise: Sonic safety devices]. The modifications would not substantially alter the intent of the ordinance, but provide clarifying language related to the type of non-sonic warning devices that must be used when operating heavy equipment within 1,500 feet of residences. The modification also clarifies that the requirement applies to all sonic safety device at the mining site. A proposed modification to Mining Ordinance Section 10-4.423 clarifies that increases in ambient noise levels shall be measured in dBA rather than dB. As described in Table 4.10-1, dBA is an A-weighted measurement that better correlates to the human ear the dB measurement. The proposed modifications to Secs. 10-4.422 and 10-4.423 are clarifications and would not result in a significant impact.

All off-channel mining activities would be subject to the Mining Ordinance Section 10-4.421, which sets maximum allowable noise levels. In addition, new mining locations and new processing facilities would be required to undergo project-specific CEQA review. The project-specific CEQA review will take into consideration site specific conditions and project details to evaluate noise generation and potential noise impacts on sensitive receptors and evaluate whether the project would be in compliance with the ordinance standards. Therefore, the potential for off-channel OCMP activities under the CCAP Update to result in a substantial temporary or periodic increase in ambient noise levels is less than significant. (LTS)

Soil on Reclaimed Land

The proposed modification to Section 10-5.532 of the Reclamation Ordinance would require that land that is reclaimed to a use that requires planting of vegetation be supplied with an appropriate soil profile to support the plantings. This would improve the probability of success of reclamation plantings, but could require soil material and/or supplements to be hauled in to the reclamation site (if there is inadequate on-site soil) and placed at the reclamation site using

earthmoving equipment. These truck trips and earthmoving equipment would generate noise. However, the noise from trucks and earthmoving equipment related to placement of soil and supplements would be similar to (and likely less than) the noise generated by mining and reclamation equipment. As discussed above, off-channel mining activities would be subject to the Mining Ordinance Section 10-4.421, which sets maximum allowable noise levels. Compliance with existing regulations would ensure that acceptable noise levels at nearby sensitive receptors are not exceeded. Therefore, the potential for noise related to trucks and earthmoving equipment needed for import of soil and supplements for reclamation plantings to result in a substantial temporary or periodic increase in ambient noise levels is less than significant. (LTS)

Impact NOI-2: The CCAP Update would not result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels (LTS)

This criterion from the updated CEQA Guidelines Appendix G states:

> Generate excessive groundborne vibration or groundborne noise levels.

This criterion is very similar to the previous Appendix G criteria considered in the Initial Study prepared for this Project (the Initial Study found this impact to be potentially significant and indicated it would be further evaluated in the EIR) which states:

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

The following discussion addresses both of these criteria.

The CCAP Update would allow for continued implementation of in-channel CCRMP/CCIP activities and off-channel OCMP activities, both of which would use a variety of heavy equipment and could generate groundborne vibration and groundborne noise.

Proposed Revisions to In-Channel Plans and Regulations

As indicated in Table 4.10-3, at the end of this section, the CCAP Update includes revisions to the targeted channel shape and boundary for the Cache Creek channel, potentially resulting in modifications to the streambed and channel banks. In addition, proposed changes to the In-Channel Ordinance would allow an increase in the amount of aggregate material that could be removed from the channel during any given year for purposes of channel maintenance and erosion control. The CCAP Update could result in an increase in heavy equipment use in the channel (related to the potential increase in occasional material removal) and the heavy equipment activities could be located slightly closer to off-channel receptors resulting from potential modifications to the channel banks related to allowed in-channel maintenance and bank modifications related to achieving the revised Channel Form Template.

The equipment used to implement in-channel and typical bank stabilization projects could include excavators, bulldozers, scrapers, and haul trucks. These types of equipment could cause groundborne vibration to migrate away from the work area. Table 4.10-5 presents published vibration levels at 25 feet from the types of equipment that could be used during in-channel and typical bank stabilization projects. Table 4.10-5 also presents the calculated buffer distance that would be required to reduce vibration levels to below the 80 VdB threshold to prevent disturbance to residential receptors.

Table 4.10-5: Vibration Source Levels for Heavy Equipment

Equipment	Reference RMS at 25 Feet (VdB)[a]	Required Buffer Distance – Residential Threshold 80 VdB (Feet)[c]
Large Bulldozer	87	43
Loaded Trucks	86	40
Excavator	87[b]	43
Scraper	87[b]	43

Notes: Receptors within the buffer distance could be impacted by construction-generated vibration. Receptors outside of the buffer distance would not be expected to be impacted by construction-generated vibration.
a RMS = root mean square, VdB = vibration decibel
b No established vibration levels values of an excavator or a scraper are listed in the source described below. However, because an excavator and a scraper are both earth moving machinery, vibration levels are estimated to be similar to a large bulldozer.
c Buffer distances were calculated based on the following propagation:
RMS2 = RMS1 – 30 Log10 (D2/D1)
Where:
RMS1 is the reference vibration level at a specified distance.
RMS2 is the calculated vibration level.
D1 is the reference distance (in this case 25 feet).
D2 is the distance from the equipment to the receptor.
Source: Federal Transit Administration, 2006. Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06).

Based on review of aerial imagery of the CCAP area, there are no existing sensitive receptors within 43 feet of the existing banks of the Cache Creek channel or the proposed Channel Form Template boundary and therefore, no sensitive receptors would be exposed to unacceptable vibration levels.

In addition, all in-channel CCRMP/CCIP activities (e.g., erosion control, creek stabilization, and flood capacity conveyance projects) are currently subject to (and would continue to be under the CCAP Update[9]) the In-Channel Ordinance, as follows:

> Section 10-3.409. Hours of Operation.
>
> All in-channel operations shall be limited to the hours· of 8:00 a.m. to 5:00 p.m., Monday through Friday, unless emergency conditions require otherwise as determined by the Director.

This regulation restricts the time of day and days of the week that in-channel potential vibration-generating activities are allowed to occur and ensures that heavy equipment operation that could generate groundborne vibration and groundborne noise would not occur when it would be most objectionable to receptors (i.e., at night when people are trying to sleep). This regulation would further protect sensitive receptors from nuisance vibration impacts. No vibration would occur after the in-channel projects are completed. Therefore, the potential for in-channel CCRMP/CCIP activities to expose persons to or generate excessive groundborne vibration and groundborne noise level is less than significant. (LTS)

[9] Under the CCAP Update, Section 10-3.409 would be renumbered to Section 10-3.408; no other changes would be made.

Proposed Revisions to Off-Channel Plans and Regulations

As indicated in Table 4.10-3, at the end of this section, the CCAP Update would result in the designation of 1,188 new acres within the OCMP planning area to SGRO which would allow future mining consistent with the program but on acreage not previously considered in the original OCMP or evaluated in the OCMP EIR. The potential new mining areas would be located within (and constrained to) the "Future Proposed Mining" areas shown on Figure 3-4. Therefore, off-channel OCMP activities (mining and processing) under the CCAP Update could occur in proximity to sensitive receptors that have not been affected by past mining activities.

All off-channel mining activities would be subject to the Mining Ordinance Section 10-4.421, which sets maximum allowable noise levels. Consistent with the OCMP EIR finding, the distance required to achieve acceptable noise levels is generally adequate to ensure acceptable ground vibration levels, and therefore compliance with noise standards would ensure that vibration impacts are also mitigated. In addition, any new mining location or new processing facility would be required to undergo project-specific CEQA review. The project-specific CEQA review will take into consideration site specific conditions and project details to evaluate groundborne vibration and groundborne noise impact on sensitive receptors and evaluate whether the project would be in compliance with the ordinance standards. Therefore, the potential for off-channel OCMP activities under the CCAP Update to expose persons to or generate excessive groundborne vibration and groundborne noise level is less than significant. (LTS)

Table 4.10-3: Proposed Changes to the CCAP Documents Associated with Noise and Vibration Impacts

Noise	
	CCAP DOCUMENT CHANGE
Change in the Amount of Material that Can Be Removed from the Channel in a Given Year	
CCRMP (page 34)	Based on the analysis conducted for the 2017 Technical Studies, between 1996 and 2011, an average of approximately 690,800 tons per year of sediment was actually deposited in the CCRMP area, of which 156,400 tons is estimated to be sand and gravel and 534,400 is estimated to be fines. This estimate of deposition was calculated by comparing topographic maps of Cache Creek in 1996 and 2011. It differs significantly from the original estimate in that it appears much more fine sediment is depositing in Lower Cache Creek than originally predicted. ~~in stream excavation of sand and gravel has averaged some two million tons, however, which has resulted in a cumulative deficit of nearly 80 million tons since mining intensified in the 1950s. At the natural rate of replacement it would take over 500 year to replenish the material removed~~. ~~In addition, gravel bar skimming disturbs the formation or armor materials and removes riparian vegetation that allow the channel to readjust, thus increasing the potential for erosion.~~ While it is unclear whether the current rate of deposition will continue into the future, it appears likely that at least some portions of Cache Creek are recovering faster than expected in 1996. Based on this information, the cap for in-channel extraction for maintenance purposes should be increased from 210,000 tons annually on average to 690,800 tons annually on average to reflect actual conditions. In addition, in recognition that the creek may in reality deposit no tonnage in a given year or double the tonnage in another (depending on flow conditions) the cap shall be based on the annual average deposition since the last prior year that extraction occurred, not to exceed 690,800 tons annually.
Change in the CCRMP Channel Boundary	
CCRMP (page 13)	~~The areas within both the present channel bank and the 100-year floodplain were then merged, and the outermost limit of these areas became the channel boundary for the Cache Creek Resources Management Plan (see Figure 2).~~ The area within the channel boundary originally encompassed 4,956 acres.~~; however,~~ As recommended in the Program EIR for the CCRMP, the boundary was modified to eliminate an~~the~~ off-channel mining pit operated by Solano Concrete at the time.~~, as recommended in the Program EIR for the CCRMP.~~ In addition, the large floodplains located downstream of County Road 94B were deleted.~~. from the CCRMP boundary~~ because it was determined that t~~T~~hese farmlands did~~do~~ not have a direct impact on the dynamics of the channel, except to serve as overflow areas during severe flood events. In this downstream reach, the boundary was~~is~~ defined by the ~~present~~ channel bank line, as delineated in the 1995 Technical Studies. The revised channel boundary, comprising 2,324 acres, serve~~ds~~ as the plan area for the CCRMP. In 2017, as part of the CCAP Update, the CCRMP channel boundary (also referred to as the in-channel area or the active creek channel) and the more narrow CCRMP plan area boundary

	were updated to reflect the best available information including 2011 LIDAR topography and two-dimensional hydraulic modeling using this topography, 2015 aerial photography, and the 2012 FEMA regulatory 100-year floodplain (see Figures 1, 2, and 10). As redrawn, the in-channel area totals 5,109 acres and the CCRMP plan area totals 2,266 acres.
Increase in Potential Off-Channel Mining Area	
OCMP (page 15)	**Planning Area for OCMP and CCRMP~~The Cache Creek Resources Management Plan~~** The planning area for the OCMP is defined as the area contained within the Mineral Resource Zones (28,130 acres), minus the planning~~in channel~~ area regulated under the CCRMP (2,266 acres), or a total of 25,864 acres (see Figure 4). Within the OCMP planning area, 1,900 acres are currently approved for excavation which is a subset of the 2,464-acre total for all approved mine sites (area zoned Sand and Gravel Overlay or SGO), 1,001 acres are zoned currently to allow for future mining (Sand and Gravel Reserve Overlay or SGRO), and another 1,188 acres are proposed to be rezoned for future mining, as described below. The planning area for the CCRMP is equal to the active in-channel area of the creek system, as defined by the delineated~~present~~ channel bank line or the 100-year flood elevation, ~~described in the Westside Tributaries Study prepared by the U.S. Army Corps of Engineers,~~ whichever is wider ~~(see Figure 3)~~ modified as described in the CCRMP . The in-channel area encompasses 5,109~~around 4,956~~ acres, including 2,266~~1,600~~ acres within the CCRMP~~present channel~~ boundary, plus several thousand acres located in the floodplain north of the City of Woodland (see Figure 3). ~~Subtracting this acreage from the 28,130 acres included in the State MRZs, leaves a total of approximately 23,174 acres within the planning area of the Off-Channel Mining Plan. As described in the following section, however, only 2,887 acres of the plan area are proposed to be rezoned to allow for off-channel mining over the next fifty years, or about 12 percent of the OCMP planning area.~~
Soil on Reclaimed Land	
Reclamation Ordinance (page 17)	Section 10-5.532. Use of overburden and fine sediments in reclamation. Sediment fines associated with processed in-channel aggregate deposits (excavated as a result of maintenance activities performed in compliance with the CCIP) ~~shall not~~may be used in the backfill or reclamation of off-channel permanent lakes where it can be demonstrated that no detrimental sediment toxicity exists (including unacceptable levels of mercury), and where fines will not reduce the porosity of the permanent lake in an adverse way. Fines that result from the processing of in-channel sand and gravel shall not be used for in-channel reshaping or habitat restoration efforts or as soil amendments in agricultural fields. Overburden and processing fines shall be used whenever possible to support reclamation activities around reclaimed wet pits. These materials may be used in reclamation activities without testing for agricultural chemicals. If topsoil (A-horizon soil), formerly in agricultural production, is proposed for use within the drainage area of a wet pit, the soils must be sampled prior to placement and analyzed for pesticides and herbicides (EPA 8140

	and 8150). Samples shall be collected and analyzed in accordance with EPA Test Methods for Evaluating Solid Waste Physical/Chemical Methods, SW-846, Third Edition (as updated). Topsoil that contains pesticides or herbicides above the Maximum Contaminant Levels for primary drinking water (California Code of Regulations) shall not be placed in areas that drain to the wet pits. Land reclaimed to a subsequent use that includes planting of vegetation (e.g., agriculture, habitat) shall be provided an adequate soil profile (i.e., depth and texture of soil) to ensure successful reclamation. Proposed soil profiles associated with specific proposed reclamations plans shall be subject to expert review and evaluation during the CEQA process for that project. If the project is not subject to additional CEQA review, at the discretion of the County, the proposed reclamation plan for the project may be peer reviewed by an appropriate expert/professional, and recommendations, if any, shall be incorporated into the project as conditions of approval.
In-Channel Material Removal Requirements	
In-Channel ~~Maintenance Mining~~ Ordinance (page 5)	**Section 10-3.40~~96~~. ~~Excavation~~ Limitations on Removal of Material.** (a) Where gravel bars are to be removed, there ~~excavated, aggregate removal~~ shall be ~~limited to the downstream portion~~minimal disturbance of ~~the deposit and may not exceed seventy-five (75) percent of the length of the bar. At least twenty-five (25) percent of the upstream portion of the gravel bar shall be retained, in order to allow for the establishment of~~ established, mature riparian vegetation and there shall be preservation of geomorphic controls on channel gradient where they exist. Complete removal of gravel bars may be recommended by the TAC and approved by the Director only if hydraulic conditions related to the bar are recognized to threaten structures and property. (b) Aggregate material to be removed from the streambed or streambank under approved in-channel projects shall be removed~~excavated~~ as soon as is practicable after deposition, prior to the establishment of vegetation. No stockpiles shall be left within the channel after material removal~~excavation~~ has been completed. (c) The amount of aggregate removed from the channel shall be limited to the average annual amount of sand and gravel (and associated fines) deposited since the last prior year of in-channel material removal ~~during the previous year~~ as estimated by the TAC based on channel topography and bathymetry,~~morphology data~~ not to exceed 690,800 ~~(approximately 200,000~~ tons annually on average~~)~~ over a ten-year period, except where ~~bank excavation~~bank widening is necessary ~~to widen the channel~~ as a part of implementing ~~the Test 3 Run~~ the Channel Form Template, ~~Boundary,~~ or where potential erosion and flooding problems exist. The amount and location of in-channel aggregate material removal shall be carried out according to the ongoing recommendations of the TAC and any related County approvals, with the voluntary cooperation of the landowners.
	Other regulations relevant to Noise
	Section 10-4.421. Noise: General standard. From 6:00 a.m. to 6:00 p.m., noise levels shall not exceed an average noise level equivalent (Leq) of eighty (80) decibels (dBA) measured at the property boundaries of the site. However, noise levels shall not exceed an average noise level equivalent

	(Leq) of sixty (60) decibels (dbA) for any nearby off-site residences or other noise-sensitive land uses. From 6:00 p.m. to 6:00 a.m., noise levels shall not exceed an average noise level equivalent (Leq) of sixty-five (65) decibels (dBA) measured at the property boundaries of the site. At no time shall noise levels exceed a community noise equivalent (CNEL) of sixty (60) decibels (dBA) for any existing residence or other noise-sensitive land use. An existing residence shall be considered the property line of any residentially zoned area or, in the case of agricultural land, any occupied off-site residential structures. Achieving the noise standards may involve setbacks, the use of quieter equipment adjacent to residences, the construction of landscaped berms between mining activities and residences, or other appropriate measures.
	Section 10-4.422. Noise: Sonic safety devices. If mining occurs within fifteen-hundred (1500) feet of residences, equipment used during nighttime activities shall be equipped with non-sonic warning devices (eg. infrared) consistent with the California Office of Safety Hazard Administration (Cal OSHA) regulations. This~~, which~~ may include fencing of the area to avoid pedestrian traffic, adequate lighting of the area, and placing an observer in clear view of the equipment operator to direct backing operations. If appropriate, p~~P~~rior to commencement of operations without sonic warning devices, operators shall file a variance request with the California OSHA Standards Board showing that the proposed operation would provide equivalent safety to adopted safety procedures, including sonic devices. This regulation applies to all sonic safety devices in use at the mining site, including sonic warnings on conveyors.
	Section 10-4.423. Noise: Traffic. Operators shall provide acoustical analysis for future truck and traffic noise associated with the individual operations along County roadways identified as experiencing significant impacts due to increased traffic noise. The study shall identify noise levels at adjacent noise-sensitive receptors and ways to control the noise to the "normally acceptable" goal of a CNEL of sixty (60) dB and reduce the increase over existing conditions to five (5) dBA or less. Typical measures that can be employed include the construction of noise barriers (wood or masonry), earthen berms, or re-routing of truck traffic.